Electronic Records Research Report

Prepared for the
Records Management Interagency Coordinating Council

By the
Electronic Records Research Committee

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

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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. 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.
I. Managing Electronic Records in Compliance with Standards and Legal Requirements

Standard or Objective

To manage electronic records in accordance with requirements for government records in all media.

Findings

The Standards and Policies Focus Group identified laws, rules, standards, and guidelines already in effect in Texas. These were analyzed to determine the present requirements for managing electronic records, the authority vested in agencies responsible for issuing rules about records or information, any perceived weaknesses or omissions in the present laws, and any conflicts or points of confusion that might exist among the rules.

The two agencies primarily responsible for managing records and information resources in Texas are the Texas State Library and Archives Commission (TSLAC) and the Department of Information Resources (DIR). Primary authority for establishing rules on records management, archival preservation, and access to state publications resides in TSLAC. Specific laws and rules governing TSLAC can be found in the Texas statutes and the Administrative Code.

Primary authority for establishing rules on the use of automated resources, including the protection of state-owned information created with those automated resources, resides in DIR. Although the terms record or records management do not appear in DIR’s legislation, the Information Resources Management Act states that “information and information resources possessed by agencies of state government are strategic assets belonging to the residents of this state that must be managed as valuable state resources.”

In addition to the rules mentioned above, the Public Information Act requires that all information not specifically exempted from disclosure be made available to the public upon request.

The ERRC concluded that the authority to implement most of its recommendations currently resides within the purview of both TSLAC and DIR.

The Focus Group also reviewed studies performed on similar issues of electronic records management in other states within the United States, Canada, New Zealand, Australia, and the United Kingdom (see Bibliography of Selected Resources).
Problem Statement

Although administrative rules have been adopted for government information maintained electronically, there is neither a uniform level of knowledge nor application of these standards by both records management and information technology staff. Methods of administering electronic files have evolved from computer systems design considerations that may conflict with sound records management practices. Effective management of electronic records is unlikely to occur without mutual involvement of both disciplines.

Recommendation 1

The Department of Information Resources and the Texas State Library and Archives Commission should establish administrative procedures and training to ensure that records management, archives, and information systems staff work together to identify and manage electronic records to meet retention and archival preservation requirements.

For the future assurance of accessibility and preservation of records in electronic format, IT professionals must understand the value of the information and accept responsibility for managing information (records) in their care. Records management and archival professionals must become aware of the problems created by information systems and the complexity of managing these systems. Each profession needs to become aware of the skills and abilities of the other, recognize how those skills can effect better management, and develop effective communications with one another.

As an example of present communications problems, all three disciplines use many of the same words to describe their activities. Unfortunately, these words have different meanings in each profession, which often leads to misunderstandings. Two of the terms used frequently in this paper have different meanings in records management, archives, and information systems. The noun “record” to a records manager or archivist means any type of material, regardless of media, which documents a business activity. To an information systems professional, a “record” is a collection of characteristics (fields) treated as a unit within a database. The verb “archive” to a records manager or archivist means to transfer historically valuable records to an organization responsible for preserving the material for future use. To an information systems manager, “archive” generally means to move old, inactive files from the computer system to another medium in order to regain storage space and increase processing speed. This is usually done without regard to record function, administrative or historical value, or retention period—unintentionally creating problems from a records retention or archival perspective.

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

A. The Texas State Library and Archives Commission and the Department of Information Resources should review and amend current rules in conjunction with one another to assure that records managers, archivists, and information
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. 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. 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. 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 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
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. 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:

(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 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. The 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
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.
M any 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 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.

2. 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 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 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\textsuperscript{16} adopted by the Department of Information Resources state in part:

\begin{quote}
It is the policy of the State of Texas that:
\begin{enumerate}
\item [(G)] Security requirements shall be identified, documented and addressed in all phases of development or acquisition of information resources.
\end{enumerate}
\end{quote}

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:

<table>
<thead>
<tr>
<th>Application Lifecycle Stage</th>
<th>Correction Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements Stage</td>
<td>—</td>
</tr>
<tr>
<td>Design Stage</td>
<td>1.5 times fixing the issue in Requirements Stage</td>
</tr>
<tr>
<td>Before Coding</td>
<td>1 times fixing the issue in Requirements Stage</td>
</tr>
<tr>
<td>Before Testing</td>
<td>10 times fixing the issue in Requirements Stage</td>
</tr>
<tr>
<td>Test Stage</td>
<td>60 times fixing the issue in Requirements Stage</td>
</tr>
<tr>
<td>In Production</td>
<td>100 times fixing the issue in Requirements Stage</td>
</tr>
</tbody>
</table>

Source: Principles of Software Engineering Management, Thomas Gilb

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, 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
records management and the State Records Center currently charges agencies for storage, the results show that managing records consistently can achieve savings.

**Recommendation 3**

The Texas State Library and Archives Commission should seek a legislative change in the Local Government Records Act so that the rules for managing electronic records can be amended to make these standards applicable to all local government records maintained in electronic format.

Current legal requirements for local government recordkeeping in Texas are outlined in the Local Government Records Act (enacted in 1989, as amended by the 73rd through 75th Legislatures). Provisions for administering the Act lie in the statutes governing the Texas State Library and Archives Commission. The Local Government Records Act establishes the following general provisions for local records:

§ 201.002. PURPOSE. Recognizing that the citizens of the state have a right to expect, and the state has an obligation to foster, efficient and cost-effective government and recognizing the central importance of local government records in the lives of all citizens, the legislature finds that:

1. the efficient management of local government records is necessary to the effective and economic operation of local and state government;
2. the preservation of local government records of permanent value is necessary to provide the people of the state with resources concerning their history and to document their rights of citizenship and property;
3. convenient access to advice and assistance based on well-established and professionally recognized records management techniques and practices is necessary to promote the establishment of sound records management programs in local governments, and the state can provide the assistance impartially and uniformly; and
4. the establishment of uniform standards and procedures for the maintenance, preservation, microfilming, or other disposition of local government records is necessary to fulfill these important public purposes.

Chapters 202 through 205 provide specific statutes related to destruction and alienation of records, management and preservation of records, microfilming of records, and electronic storage of records.

All of these provisions are applicable to records in all formats, including electronic, as stated in the definition of a local government record.

§ 201.003. DEFINITIONS

8. “Local government record” means any document, paper, letter, book, map, photograph, sound or video recording, microfilm, magnetic tape, electronic medium, or other information recording medium, regardless of physical form or characteristics...

In addition, Chapter 205 clarifies the particular requirements applied to records maintained electronically. Among these is the stipulation that the Texas State
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.
II. Establishing Functional Requirements for Creating, Maintaining, and Preserving Records in Electronic Format

Standard or Objective

To establish vendor-independent functional requirements for managing records in electronic formats that will benefit day-to-day management and long-term preservation.

Findings

The Functional Requirements Focus Group identified studies and projects undertaken by universities, states, and federal government units. The study most often cited is from the School of Library and Information Science at the University of Pittsburgh. Although the Pittsburgh study is theoretical, several attempts have been made to put its principles into practice. One such attempt resulted in the Department of Defense (DoD) document, Design Criteria Standard for Electronic Records Management Software Applications. The standard “…defines the basic requirements based on operational, legislation and legal needs that must be met by records management application (RMA) products acquired by the Department of Defense (DoD) and its Components.”

The Functional Requirements Focus Group decided to adapt the DoD standard to fit the needs of Texas government. Although the DoD document applies only to electronic records management software applications, the Texas Functional Requirements for Managing Electronic Records (Appendix 3) sets baseline standards for any systems managing electronic records. This could include database management systems used to maintain electronic records whether or not they are labeled as “electronic records management software.”

In addition to studying functional requirements for recordkeeping systems, the Focus Group reviewed legislation concerning the preservation of Texas history through the Archive program within the Texas State Library and Archives Commission. The present Electronic Records Management rules (see Section I, Recommendation 2) recognize that some electronic records need not be saved electronically. Printed copies of word-processed documents have proven adequate for long-term use, but printed copies of spreadsheets will not serve as an archival record. A spreadsheet without the underlying formulas is just so much raw data without attendant meaning. The printout of the results of a database query is perfectly understandable to its immediate users. The database printout without the search strategy or, indeed, information about the entire database, will become meaningless over time as the
context of the query's creation is lost. Hypertext links between documents can meaningfully exist only in an electronic form. As seen through these examples, valuable information within or about these documents (metadata) can only be saved in an electronic format.

Problem Statement

As the conduct of the state's business increasingly relies on computers, there is an increasing likelihood that the state is jeopardizing its obligation to be accountable to the public today and tomorrow. Not all information systems are designed to be recordkeeping systems. Even though electronic systems create and store information, they may not be creating records to provide the accountability, authenticity, and integrity needed to provide evidence of business transactions. In addition, long-term access to electronic records is problematic because of the rapid changes in technology. If archival records were required to be hardware- and software-independent, they could be assessed without any special equipment needs and could be migrated as long as they have value. Unfortunately, some record structure would be lost. To maintain record structure, the appropriate software and computer hardware would have to be preserved, or a data migration strategy would have to be established to move the records to current systems periodically. However, none of these choices are without obstacles and new problems may arise as more state business is conducted electronically. As an example, migrating electronic records to new technology could invalidate documents signed with digital signatures.

Recommendation 1

The Department of Information Resources and the Texas State Library and Archives Commission should jointly establish and publish guidelines for using standard functional requirements for electronic recordkeeping systems.

Developing and adopting standards for functional requirements will mean that all systems provide the same functionality and use the same set of data elements to identify a record. This synchronicity will facilitate both information management and the information's dissemination across disparate computer and communications systems.

The draft standard sets forth baseline functional requirements for systems managing electronic records. This standard is proposed for use by all state agencies in the implementation of their records management programs. This standard specifically addresses electronic records, but it is adaptable to state records in all media.

To implement this recommendation, the following should occur:

A. The Department of Information Resources and the Texas State Library and Archives Commission should review the functional requirements for managing electronic records developed by the Functional Requirements Focus Group, seek
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 begin 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.
Each agency will need to decide whether or not to purchase electronic records management systems or develop other means to manage electronic records. Costs based on their needs will be determined at that time.

Recommmendation 2

The complex issues of retaining electronic records of enduring value for historical and research purposes should be given further study to identify available options and associated costs with the intent of proposing action to the 77th Legislative Session.

The 75th Legislature enacted a new state records law that codified, clarified, and modernized a series of prior laws—enacted piecemeal over the past 100 years—relating to the management and preservation of the records of state agencies. The law particularly strengthened the authority of the state archivist to identify and ensure the preservation of archival state records. As defined in the law, an archival state record is

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.

The basic statutory provisions for a state archives program mandate that the Texas State Library and Archives Commission

shall take legal custody of and preserve archival state records and shall endeavor to collect and preserve other historical resources determined by the director and librarian to possess sufficient value to warrant continued preservation in the state archives.

In addition, the following alternatives are specified concerning the custody of archival records:

§ 441.186. ARCHIVAL STATE RECORDS.

(d) Archival state records shall be transferred to the custody of the commission when they are no longer needed for the administration of the state agency unless state law requires that the records remain in the custody of the agency.

(e) If the commission cannot accept immediate custody of an archival state record, the record shall remain in the custody of the state agency and shall be preserved in accordance with this subchapter, rules adopted under this subchapter, and other terms on which the director and librarian and the agency head agree.

(f) Instead of transferring archival state records under this section, the components of university systems and other institutions of higher education may retain and preserve the archival state records of the component or institution in accordance with this subchapter and rules adopted under this subchapter if the records are preserved in an archives established in a library or research center directly controlled by the university.
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 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.

A 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.
III. Making State Agency Documents in Electronic Formats Readily Available to and Easily Located by the Public

**Standard or Objective**

To serve the citizens of Texas better by providing electronic access to services and information in a cost-effective manner.

**Findings**

The Standards and Policies/Access Feasibility Focus Group identified laws, rules, standards, and guidelines already in effect in Texas and looked at methods currently being used to distribute information to the public electronically. They also reviewed methods used by other states and the federal government.

Several agencies in Texas share rulemaking authority that affects public access to government information. The Texas State Library and Archives Commission is responsible for collecting state publications, distributing them to depository libraries around the state, and providing an index to these publications. The Department of Information Resources develops standards and policies for the security of information created by information assets. Laws that require information to be made available to the public are found in the Public Information Act, which is interpreted by the Office of the Attorney General. In conjunction with the Public Information Act, the General Services Commission develops recovery cost models for providing copies of information to the public upon request.

In an attempt to simplify the process of locating documents by the public, the federal government developed a standard for indexing government information. Each federal agency is required to use the system to identify information it produces. The system is called the Government Information Locator Service (GILS). This focus group briefly reviewed studies pertaining to the implementation of GILS at the federal level and the use of similar information locator services in other states. Texas has developed a pilot study, Texas Records and Information Locator Service (TRAIL) (http://isadore.tsl.state.tx.us/trail/), based on GILS, to assess the feasibility of indexing state information using this method.

The current environment in Texas indicates a trend toward the use of the Internet to describe agency regulatory responsibilities and services and to disseminate directories, policies, rules, and forms to the public. The Department of Information Resources noted in its Biennial Report on Information Resources Management that 83% of agencies have established Web sites. Several agency Web sites, including the
Window on State Government created and maintained by the Comptroller of Public Accounts (http://www.window.state.tx.us/), provide access to information about their own organization as well as links to other government Web sites. The Texas State Library and Archives Commission and the Department of Information Resources are cooperating to provide an on-line index to state information that is available on-line (http://www.state.tx.us/).

As further indication of the trend to provide government information and services over the Internet, the 75th Legislature directed the health and human service agencies, in conjunction with the Department of Information Resources, to provide technical assistance to human services providers by coordinating and enhancing existing Web sites. The results of the study were reported in the Electronic Availability of Technical Assistance submitted to the Legislature on September 1, 1998.

Recognizing this drive to publish on the Internet, the Department of Information Resources developed guidelines for implementing Web sites and using the Internet in Standards Review and Recommendation Publications (http://www.state.tx.us/Standards/). In addition, the Texas State Library and Archives Commission adopted rules for managing publications made available through the Internet. Researchers studying state and federal guidelines for managing electronic records on Web sites, noted that Texas was the only state, at the time of the study, that had developed policies or guidelines that related directly to records management issues of Web sites.

Making information readily available and easily accessible to the public may be limited by technology constraints. In order to reduce some of these problems, the 75th Legislature re-established the Telecommunications Planning Group (TPG) and charged it with developing a statewide consolidated telecommunications network for use by agencies, schools, and universities. The TPG published the Texas Government Strategic Plan for Telecommunications Services in October 1998.

**Problem Statement**

Government organizations produce a considerable amount of information with potential benefit for the public, but the public often has difficulty locating and accessing it. The 75th Legislature recognized the need to make government information more readily available to the public by enacting several laws related to electronic access. As agencies strive to meet legislative requirements to communicate with citizens, they may incur additional or unexpected costs. In addition, as more information becomes centrally available and easily searchable, the public may express increasing concerns about individual privacy. Guidance will be necessary to ensure that the information and services that agencies provide are delivered in a cost-effective manner without compromising personal privacy.
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 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. 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. 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. 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. 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.
Fiscal Impact

Cost-recovery models for distributing different types of information will relieve the agency dilemma of trying to support both mission-critical functions and public access with insufficient budget appropriations. Implementing the telecommunications plan will save the state thousands of dollars. Developing cost estimates for doing business and providing public information and services through the Internet will help agencies plan and budget more realistically. Sharing technical assistance as outlined in Electronic Availability of Technical Assistance,37 will benefit all agencies, but especially the small agencies with limited resources, skills, and staffing.

According to Gartner Group, Web-applications costs are based on four fixed costs and one variable cost.38 The fixed costs are for the server, Internet connection speed, amount of data stored, and the amount of data received. Passive Web site costs are estimated to be between $3,600 and $7,200 per year. Electronic commerce Web sites that allow order taking are estimated to cost between $40,000 and $96,000 per year. Transaction-processing Web sites that connect to back-office databases are estimated to start at $200,000 per year. The variable criterion in determining Web costs is based on the amount of change to the Web site—more change produces more expenses. A high amount of changes to passive Web sites could double the cost. Furthermore, there will be additional costs for security and dial-up costs for agencies providing telephone access to information.

Recommendation 2

The Department of Information Resources, the Texas State Library and Archives Commission, and the Office of the Attorney General should jointly establish rules and guidelines for providing and managing access to publicly available government information without compromising the privacy of citizens.

Government is expected to protect and provide services to its citizenry. In order to protect, provide, and perform expected functions, government organizations collect data. In the past, the data was maintained inside the government organization. A citizen requiring specific information could contact the organization and arrange to review it, oftentimes finding it necessary to travel to the physical location during normal business hours and battle traffic and parking problems. As a result, both the public and the organization’s staff welcome the ability to make all that information available on-line to enable easy access. Unfortunately, making the information available over the Internet and readily accessible from anywhere by anyone can lead to privacy problems. A name obtained from one database, an address from another, and a social security number or driver’s license from yet another could lead to unintended consequences. Authentication and security measures must be in place at all times.

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

- SRRPU B08  Directory and Locator Services
- SRRPU B04  Personal Use of E-Mail & Internet Services
- SRRPU B10  Personal Naming Convention
- SRRPU B11  World Wide Web Design and Coding Guidelines
- SRRPU B12  E-Mail and Document Interchange Guidelines
- SRRPU B13  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.
IV. Continuing the Study Requested by Section 4 of Acts 1997, 75th Legislature, Chapter 1186

**Standard or Objective**

To achieve the most comprehensive, yet cost-effective means to ensure long-term accessibility to government business and historical records, while providing benefits and services to the citizens of Texas for generations to come.

**Findings**

The Electronic Records Research Committee consists of state agency personnel who, because of a keen interest in the issues surrounding electronic records management, volunteered to work on the committee or focus groups. During the course of the year, a number of members left the committee because of time constraints and responsibilities imposed by their official agency jobs, changing jobs within state employment, or leaving state employment altogether. Replacing all the members that left, particularly those who served on the primary committee and also served as chairpersons of the focus groups, was difficult. Initially, there were four focus groups. After the chair and co-chair left the Access Feasibility Focus Group, the group was combined with the Standards and Policies Focus Group. The Standards and Policies Focus Group also lost its chair, but a replacement was found. This event increased the workload for the remaining team members.

Researching the issues unearthed several reports prepared by other states or countries. Although the information presented in these reports was beneficial to the RMICC study because it covered many of the same problems, these reports were based on data collected from the other states or countries. The most comprehensive projects reported were funded through research grants or legislation. For example, the project that produced Models for Action: Practical Approaches to Electronic Records Management and Preservation was funded in part by the National Historical Publications and Records Commission through a partnership between the New York State Archives and Records Administration and the Center of Technology in Government over a two-year period.

**Problem Statement**

The charges given the Records Management Interagency Coordinating Council encompassed disparate, but overlapping issues pertaining to long-term use of electronic records. As the meetings of the Electronic Records Research Committee
progressed, it became apparent that the issues surrounding the four charges were enormous and that the committee was constrained by lack of time and funds.

**Recommendation**

The Records Management Interagency Coordinating Committee should facilitate an ongoing examination of the critical issues of using, managing, retrieving, and protecting electronic records for the preservation of Texas history and seek funding sources to allow staff to focus full-time efforts on the study.

Texas is rapidly embracing new technology for providing benefits and services to its citizens. All agencies now have electronic mail addresses. Most have developed Web sites. The 75th Legislature enacted legislation allowing the use of digital signatures when conducting business with the state and required the General Services Commission to study the feasibility of implementing an electronic marketplace for state government. Texas Legislative sessions are broadcast via radio and over the Internet. Some states broadcast their legislative sessions over television or the Internet and videotape them for future access. Texas will likely follow suit. Telecommunications issues are important, as many agencies must depend on remote access to keep in contact with home and satellite offices.

All of these technologies bring new and continuing challenges to Texas government’s ability to manage and preserve information in electronic format.

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

A. The Records Management Interagency Coordinating Council should be allowed to seek funding in order to continue the study.

B. The Records Management Interagency Coordinating Council should be allowed to seek public and private partnerships in order to continue the study.

C. The Records Management Interagency Coordinating Council should be authorized to specify agencies to participate in the ongoing study.

**Implications**

A. Membership of the Electronic Records Research Committee was restricted to participants in the Austin area. Although meetings were held during the work week at state agencies, participants often used their own time for researching the issues and writing the reports. If available, funds could reimburse participants attending meetings outside their home area as well as pay administrative help. Some comments about the recommendations in this report indicate that agencies and universities would welcome a pilot study for implementing an electronic records management program within a Texas agency. Setting up such a study would require more funds.
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:

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

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.
Bibliography of Selected Resources

States and Universities

Delaware Public Archives
http://www.lib.de.us/archives/del-proj.htm
Report of a two-year, federally funded project by the Delaware Public Archives to design and implement a program for the ongoing study of government electronic records, entitled the Delaware Project: Ensuring Our Electronic Legacy; project focuses on training and education, functional requirements for recordkeeping, and existing government information systems.

Government Information Locator System (GILS) Implementation in United States
http://www.usgs.gov/gils/other_us.html
List of all states with a GILS and Internet link to Web sites for each state; includes TRAILS (Texas Records and Information Locator Service).

Florida Department of State
http://www.dos.state.fl.us/dlis/index.html

Indiana University Electronic Records Project
http://www.indiana.edu/~libarche/
Published findings (1998) of a project designed to implement and test the Functional Requirements for Evidence in Recordkeeping model developed by the University of Pittsburgh Electronic Records Project.

New York – State Archives and Records Administration
http://www.sara.nysed.gov

University of Pittsburgh
http://www.sis.pitt.edu/~nhprc/
Publication of the School of Library and Information Science Project for Functional Requirements for Evidence in Recordkeeping.
United States Government

National Archives and Records Administration (NARA)
http://www.nara.gov/


NARA Electronic Records Work Group
http://www.nara.gov/records/grs20/reprt914.html

Other Countries


Work group report of recommendations for implementing the Australian Government Locator Service, including discussions of a proposed metadata schema and technical/business processes; a set of strategies to facilitate agency implementation; and a change management strategy.

Archives Authority of New South Wales, Australia

British Columbia Archives
http://www.bcarchives.gov.bc.ca/index.htm
Policies for government records and recorded information management with sections on electronic records, electronic mail and facsimile transmissions, electronic imaging systems, and voice mail.

Government of Canada GILS
http://gils.gc.ca/gils/info_ea.html
Provides access to Canadian government information resources.

### Standards/Professional Organizations

**AIIM – Association of Information and Image Management**
http://www.aiim.org/

**American Standards National Institute (ANSI)**
http://www.ansi.org/default.js.htm

**ARMA – Association of Records Management Administrators**
http://www.arma.org/hq/

**ASIS – American Society for Information Science**
http://www.asis.org/

Reports on research and recent developments regarding electronic recordkeeping.

**NAGARA – National Association of Government Archives and Records Administrators**
http://www.nagara.org/

Discussions of up-to-date issues are provided in publications such as NAGARA Clearinghouse (for example, the Winter 1998 issue discusses the legal challenge to General Records Schedule 20 issued by NARA to allow federal agencies to destroy electronic records); and NAGARA Crossroads (a periodical focused on developments in electronic records management and information technology, Web site: http://www.nagara.org/crossroads.html).

**Standards Australia**
http://www.standards.com.au

Provides access to the Australian Standard AS 4390-1996 for Records Management; Electronic Recordkeeping Web Site Guide; and new standards in draft form.

**W3C: World Wide Web Consortium**
http://www.w3.org/Metadata/

Among other projects, the W3C metadata group is working on developing the Resource Description Framework (RDF) — a foundation for processing metadata that provides interoperability between applications that exchange machine-understandable information on the Web.
Notes

11. 1 Tex. Admin. Code § 201.3.
16. See Note 7.
20. See Note 2.
35 See Note 31.
39 See Note 31.
44 13 Tex. Admin. Code § 3.3.
47 See Note 1.
Appendix A

Factors in Determining Cost-Effectiveness of Electronic Records

Electronic Records Research Committee
Cost Effectiveness Workgroup

Kimberly M. Bradley, Chair
Denise R. Pullin, Assistant Chair
Tamara Armstrong, Member
Daniel Proctor, Member
Benny Ridge, Member

October 12, 1998
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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.
Factors in Determining Cost Effectiveness of Electronic Records

Introduction

Today, critical information is created and stored on a medium unreadable without machines. This complicated medium takes many forms and is understood only through the intercession of programmers, systems analysts, hardware specialists, and other technical personnel. Because the typical user is not a computer specialist, he has to believe that the information scrolling across his computer screen actually exists. In actuality, the information is encoded on discs, tapes, hard drives, and other machines.

Computer systems have proved invaluable. Data is easy to retrieve and sort. New data is easily created from old data. Words and numbers can be created and edited faster and more accurately than ever before. The business world has become completely dependent on computer and communications technologies, forever replacing the old standards.

Cost comparisons can be difficult to make between new electronic records and old paper-based systems. For instance, unlike computer records, the cost of storing a record on a piece of paper is virtually nothing. However, the benefits of using electronic records exceed the extra costs. Each agency will have different costs based on its mission, size, location, security needs, variety of administered programs, and other factors. Any agency, however, can compare costs of electronic- and paper-based records, study its customer needs, understand its records management needs, and examine other cost factors. This paper provides possible points of comparison, questions each agency will have to answer, and specific cost issues.

Benefits and Problems

New technologies often solve old problems while inadvertently creating new, additional problems. Although computer technology has existed for about fifty years, computers have only replaced traditional office equipment within the past fifteen years. The replacement process is occurring while the new technology continually changes. Records managers have tried to manage the new electronic records with the models used for paper-based systems. While some records management practices remain useful, other methods must be changed and new practices developed.

Computer technology represents a new storage medium. The old medium consisted of records that were contained on one or more sheets of paper, placed in paper folders, and stored in metal cabinets or cardboard boxes. To reduce bulk, paper was
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 spurious 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.
- New software may not be compatible with previous versions causing records created in the earlier versions to be unaccessible.

- Older versions of software may work properly only on obsolete machines.

- Electronic documents created with proprietary software cannot always be read by other software.

- Data with different retention periods stored together increases the risk of premature deletion of information. Additionally, some data may be kept far beyond its retention period thereby increasing liability risk.

- Future generations may not be able to access their history because the information may exist in an unreadable format or have been wiped out in an ill-advised purge. Often no thought is given to preservation or use beyond a few years. Much of the greater productivity gained by using electronic media is reduced by the loss of potentially valuable information. This loss can destroy history while making it impossible for agencies to document decisions and actions. The lack of documentation could affect the outcome of regulatory actions and lawsuits.

Today, more people understand that the information on this new medium must be managed and that some management models and methods are no longer applicable. New methods must be devised to make the data accessible to all citizens while preserving the data throughout their established retention lengths (and for historical purposes when necessary). This difficult task must be planned and managed.

**Need for Planning**

There is no true one-size-fits-all solution to electronic records. Each agency in the State of Texas, and often each department within an agency, will have different needs based on staffing levels, records retention lengths, percentage of historical records an agency creates, as well as many other factors. Each application will need to be studied and planned. Poor planning will result in wasted money or a disastrous loss of data. As a first step, an agency must understand what it wants from its electronic records and how it will manage them. There are many approaches to this goal. A dedicated electronic records system that manages records on personal computer hard drives, tapes, discs, diskettes, and networks could represent one option. Another approach is policy and staff training that will manage electronic records. Regardless of the approach, several questions must be answered.

- Will policy or an electronic records system incorporate more than one document format (for example, word processing files, imaged paper records, electronic spreadsheets, and database tables)? If so, links must be part of the system. For instance, personnel records may consist of electronic versions of performance appraisals, scanned images of transcripts and applications, spreadsheets of earnings and leave, and so forth. These different documents would need to be
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.
How will record retention lengths affect policy or a dedicated electronic records management system? Record series with short retention (under ten years) present fewer problems than those with longer retention, particularly in terms of hardware and software obsolescence. The system or policy will have to contain methods to destroy all copies of a group of records when they reach their retention periods without affecting those records that have not yet reached their established retention periods.

What is the historical nature of the records? All agencies produce records that have an interest long beyond agency business needs. Some agencies have a high volume of historical records, while others have much smaller volumes. In the past, records were turned over to the State Archives; however, electronic records depend on software and hardware formats that the Archives may not possess. An agency may have to make some provisions to preserve its historical records or transfer equipment and software to a central repository.

Electronic records provide better service, faster retrieval, and exciting new ways of working. As with any new technology, electronic records create new challenges for state agencies. Only the people within the agency/department can fully understand these challenges after a thorough understanding of benefits and risks. The technology presents certain problems, but these problems can be managed.

### Specific Cost Factors

Various factors affect the costs of managing electronic records, including the following:

- **Backfile conversion**—The process of converting documents to electronic format in order to create a complete record within an electronic environment. Usually this occurs when a new system is implemented. Often the term refers to scanning paper files into a computer, but it can also mean converting existing electronic files to a new format (for example, an agency changes from Macintosh computers to PCs). Converting records may or may not be necessary depending on how the records are used and if the records are active or inactive. This decision would need to be made on the record series level.

- **Scanning**—The process of converting paper records to an imaged/electronic file. It can consist of backfile conversion as well as documents coming to the agency that exist only on paper. Indexing is the most lengthy and costly part of this process.

- **Indexing**—The process of selecting data about an individual record in order to retrieve that record. Indexes can be either simple or complex, but are critical to retrieval. Without an index, records are impossible to find on electronic media. The complexity of the index depends on the records. Some files, such as employee records, would need only name and social security number. However, the simpler an index, the less searching and data sorting a user could execute.
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. A’s 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/W hatsN ew/USN -W R/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. A n agency is a large workgroup within the larger workgroup of state government, which in turn is responsive to the state's people. W orkers in federal government and in other states also interact with an agency. T he 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. N ow, some formatting data is critical to the use of the document. State government, as a whole, needs to adopt standard software and hardware configurations. U nfortunately, this could lead to some agencies having to upgrade software faster than otherwise necessary for their own business needs. W ithin 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— V endors create applications to perform tasks. T he 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. T he 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. A long with software/hardware changes, staff will need to be trained in electronic records management procedures. A gencies also provide staff for computer maintenance, L A N administration, network setup, and other technological tasks that did not exist fifteen to twenty years ago. A gencies must continue to provide these services or outsource. A s 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 W eb sites. S pecialized M I S 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 M I S 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 L A N 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.
Public Access

Public access is an important cost factor in an electronic records system. Government information is a resource that belongs to the people of the state. Except when information is confidential or otherwise exempt from disclosure by law, information should be available to its owners. Legislation and court cases are mandating that this information be accessible and that the system does not prevent access. The agency will need to develop workable strategies to provide this access.

While developing an electronic records system or governing policies, departments and agencies should develop means to provide access to records via the Internet, as it may be mandated in the future. However, an agency must address issues of increased bandwidth, storage needs, the creation of search engines, and Web sites. The cost of effective Web sites and their search engines can be easily underestimated (pg. 4 of A Cost/Performance Model for Assessing WWW Service Investments CTG.ISG-4, Peter A. Bloniarz, Kai R. Larsen, Center for Technology in Government, University at Albany, http://www.ctg.albany.edu).

Information on an Internet site will enhance an agency’s ability to provide information at any time and throughout the world. A customer will be able to locate handbook information, forms, and other data simply and easily. The data will be almost instantly available to the user and be more accurate than in the past. It is difficult, however, to make traditional cost/benefit comparisons of faster and more accurate information (ibid., p. 19).

At the same time, an agency will be unlikely to save money by closing down information sites or help desks. Customers may have in-depth questions about something they found on an agency site, or have new questions prompted by the data on the site. An agency could receive an increase in information requests because customers may learn about an agency’s mission from its site without having prior knowledge of an agency. In these ways, a Web site, GILS (Government Information Locator System), or similar electronic public access to information serves the customer better even if these systems do not provide cost savings to the agency.

Summary

Office work has become increasingly automated over the last thirty years. During this process, agencies have attempted to manage computer records in terms of paper records. Computer specialists claim that databases only organize, store, and allow data to be manipulated. They consider the paper printout to be the record copy of a document, and thus, the domain of the records manager. The Records Management Officer, having no authority over the computer systems housing electronic records, are likely to ignore managing them. Rules of the Texas State Library and Archives Commission require agencies to print or microfilm electronic archival records before transferring them to the archives. However, it is increasingly recognized that printing
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.
## Appendix B

### Benefit and Cost Factor Analysis

#### Benefits

<table>
<thead>
<tr>
<th>Tangible</th>
<th>Both Tangible and Intangible</th>
<th>Intangible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Space</td>
<td>Complete files that link on an identifier</td>
<td>Audit trail — accurate, thorough record of who accessed information at what time</td>
</tr>
<tr>
<td>Supplies — paper, toner, printer cartridges</td>
<td>Access to records is faster and more thorough</td>
<td>Better formatting options at your fingertips — graphs, charts, and so forth</td>
</tr>
<tr>
<td>Printers — wear and tear</td>
<td>Close down opportunities for fraud — including thorough background checks</td>
<td>Better customer service through faster and more complete information</td>
</tr>
<tr>
<td><strong>Other Issues and Benefits:</strong></td>
<td>Faster productivity</td>
<td>Public information available to users at their command</td>
</tr>
<tr>
<td>Small agencies sharing servers, devices</td>
<td></td>
<td>Multiple accesses — simultaneous</td>
</tr>
<tr>
<td>Small agencies sharing technical experts</td>
<td></td>
<td>Updating procedures manuals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rapid sorting of data</td>
</tr>
</tbody>
</table>
### Cost Factors

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
<th>Backups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual costs:</td>
<td>Actual costs:</td>
<td>Minimum — weekly backup of entire system (prefer nightly)</td>
</tr>
<tr>
<td>Viewing device (monitor, CRT, and so forth) — size and color</td>
<td>Operating system</td>
<td>Storage media</td>
</tr>
<tr>
<td>Disk storage and controller</td>
<td>Internet connection software</td>
<td>Hardware and software</td>
</tr>
<tr>
<td>Computer — size, speed, and type</td>
<td>Access — who gets in? at what level?</td>
<td>Off-site storage</td>
</tr>
<tr>
<td>Communication access connection (LAN/WAN, Internet/intranet, and so forth)</td>
<td>Software security</td>
<td>Disaster recovery planning</td>
</tr>
<tr>
<td>Servers</td>
<td>Authentication</td>
<td>Hidden: level needed</td>
</tr>
<tr>
<td>Storage, mass storage devices</td>
<td>Expungement</td>
<td>Migration of backup media</td>
</tr>
<tr>
<td>Imaging — scanner, OCR, read-only</td>
<td>Telecommunication — firewall and Web software</td>
<td>Rotation of tapes</td>
</tr>
<tr>
<td>Better bandwidth</td>
<td>Application — which ones?</td>
<td>Destroy media if expunged records</td>
</tr>
<tr>
<td>Controller cards</td>
<td>Imaging</td>
<td>— CD-ROM not rewriteable</td>
</tr>
<tr>
<td>Hidden costs:</td>
<td>Metadata</td>
<td></td>
</tr>
<tr>
<td>Training (down-time, learning curve)</td>
<td>Records management system software</td>
<td></td>
</tr>
<tr>
<td>Upgrades</td>
<td>Hidden costs: same as hardware and proprietary issues</td>
<td></td>
</tr>
<tr>
<td>Obsolescence (data migration)</td>
<td>Database</td>
<td></td>
</tr>
<tr>
<td>Maintenance (hidden cost — emergency and actual cost — planned)</td>
<td>Maintenance (hidden cost — emergency and actual cost — planned)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conversion</th>
<th>Environmental</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legacy systems — hardware</td>
<td>Floor space — server rooms/telecom rooms</td>
<td>Trainers</td>
</tr>
<tr>
<td>Backfile conversion — how far back? which records?</td>
<td>Power and climate control</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Hidden: complete set of records, study each record series to determine if they stand by themselves or need history — still link if not converted?</td>
<td>Perhaps: mainframes</td>
<td>Web site manager</td>
</tr>
<tr>
<td></td>
<td>Hidden: utilities and additional staff space</td>
<td>Database experts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Search engine creators</td>
</tr>
</tbody>
</table>

**Table Notes:**
- Hardware:
  - 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)
- Software:
  - 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 cost: same as hardware and proprietary issues
  - Database
  - Maintenance (hidden cost — emergency and actual cost — planned)
- Backups:
  - 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:
  - 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?
- Environmental:
  - Floor space — server rooms/telecom rooms
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  - Perhaps: mainframes
  - Hidden: utilities and additional staff space
- Personnel:
  - Trainers
  - Maintenance
  - Web site manager
  - Database experts
  - Search engine creators
Appendix C

Functional Requirements for Managing Electronic Records

Electronic Records Research Committee
Functional Requirements Workgroup

Stan Gunn, Chair
Carolyn Foster, Assistant Chair
Beverly Nickerson, Member
Sara Mitchell, Member

October 12, 1998
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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.
General Requirements

I. Managing Records

This draft standard sets forth baseline functional requirements for systems managing electronic records. This standard is proposed for use by all state agencies in the implementation of their records management programs. This standard specifically addresses electronic records, but it is adaptable to state records in all media. Systems managing electronic records shall conform to the administrative rules of the Texas State Library and Archives Commission for electronic records standards and procedures (13 A dministrative Code, Section 6).

II. Accommodating Year 2000 and Twenty-First Century Dates

Systems managing electronic records shall conform to Department of Information Resources standards. In any case, systems should correctly accommodate and process information containing the year 2000 and beyond as well as dates in the current and previous centuries. The capability shall include, but not be limited to, date data century recognition, calculations, and logic that accommodate same century and multi-century formulas and date values, and date data interface values that reflect the century. In addition, leap year calculations shall be accommodated (i.e., 1900 is not a leap year, 2000 is a leap year).

III. Implementing Standard Data

Systems managing electronic records shall allow for the implementation of standardized data in accordance with Department of Information Resources standards and recommendations. When selecting commercial off-the-shelf products to support electronic records management system requirements, selection criteria must include the feasibility and capability of the products to implement and maintain Department of Information Resources data standards.

IV. Security

Systems managing electronic records shall conform to the administrative rules of the Department of Information Resources for security, T A C  201.13 (b) (T e xas A dministrative Code, Section 201).
Detailed Requirements

V. Implementing and Maintaining Records Retention Schedules

1. Systems managing electronic records shall provide custodians of information resources with the capability to assign the following data when generating the records retention schedule and to update this data to maintain compliance with the agency retention schedule when recertified.

   a. Record Series Title
   b. Record Series Item Number (when applicable)
   c. Agency Item Number
   d. Retention Code (when applicable)
   e. Retention Time
   f. Security Code
   g. Legal Citation for Security Code (if Security Code is “Confidential”)
   h. Archival Code (when applicable)
   i. Medium Code
   j. Vital Code (when applicable)
   k. User definable fields (when desired)

2. Systems managing electronic records shall allow for the rescheduling of records already in the system by custodians of information resources.

3. Systems managing electronic records shall provide the capability for only custodians of information resources to place a hold on individual files or record series, which are required beyond their scheduled disposition because of special circumstances (such as a court order or an investigation) that altered the normal administrative, legal, or fiscal value of the records.

4. Systems managing electronic records shall provide the capability to output for viewing, saving, and printing records retention schedules and associated instructions, explanations of codes, lists of abbreviations, indexes, etc.

VI. Identifying and Filing Records

1. Systems managing electronic records shall provide users with the capability to select and assign a record series item number and/or an agency item number to a record.
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:
   - Subject
   - Date Filed
   - Addressee(s)
   - Format
   - Location of Record
   - Document Creation Date
   - Author or Originator
   - 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.
11. Systems managing electronic records shall link supporting and related records and related information such as notes, marginalia, attachments, and electronic mail return receipts, as well as all metadata, to the record.

12. Systems managing electronic records shall provide the capability to link original superseded records to their successor records. If the disposition of the superseded record is to destroy when replaced, the electronic records management system shall identify that the record is eligible for destruction.

13. Systems managing electronic records shall automatically date a document when it is saved as a record, and preserve the date of receipt on records received. This date shall remain constant, without being changed when accessed, read, copied, or transferred. Systems managing electronic records shall not permit this data to be edited.

14. Systems managing electronic records shall link the record metadata to the record so that it can be displayed when needed and transported with the record when a copy is made and transmitted to another location.

15. Systems managing electronic records shall provide the capability for only custodians of information resources to modify the metadata of stored records.

VII. Storing Records

1. Systems managing electronic records shall provide or interface to a repository for storing electronic records and prevent unauthorized access to the repository. If the repository is contained in an electronic database management system, the query interface between the electronic records management system and the database management system must comply with Department of Information Resources standards and recommendations.

2. Systems managing electronic records shall allow only custodians of information resources to move/delete records from the repository.

VIII. Scheduling Records

1. Systems managing electronic records shall provide the capability to automatically track the retention period of records.

2. Systems managing electronic records shall, as a minimum, be capable of scheduling each of the following three types of retention periods.

   a. Time Retention, where records are eligible for disposition immediately after completion of a fixed period of time.
b. **Event Retention**, where records are eligible for disposition immediately after a specified event takes place.

c. **Time-Event Retention**, where the retention periods of records are triggered after a specified event takes place plus a fixed period of time.

3. Systems managing electronic records shall be capable of implementing cutoff instructions.

### IX. Selecting Records

1. Systems managing electronic records shall provide for viewing, saving, and printing list(s) of records regardless of media within record series based on retention code, retention time, record series item number; and/or agency item number to identify records due for disposition processing. The information contained in the list(s) shall be user definable record profile attributes.

2. Systems managing electronic records shall provide the capability to identify records with time, event, and time-event retentions and provide custodians of information resources with the capability to indicate when the specified event has occurred and when to activate applicable cutoff and retention instructions.

3. Systems managing electronic records shall identify records scheduled for cutoff, and present them only to the custodians of information resources for approval. Systems managing electronic records shall not allow any additions or other alterations to records that have reached cutoff.

4. Systems managing electronic records shall identify records that have a hold placed on them and provide custodians of information resources with the capability to reactivate or change their assigned dispositions.

5. Systems managing electronic records shall provide for viewing, saving, and printing lists of records that have no assigned retention codes.

### X. Retrieving Records

1. Systems managing electronic records shall allow searches using any combination of the following record profile data elements.

   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
i. Other Recipients  
j. Record Series Title  
k. Record Series Item Number (when applicable)  
l. Agency Item Number  
m. Retention Code (when applicable)  
n. Retention Time  
o. Security Code (when applicable)  
p. Archival Code (when applicable)  
q. Medium Code  
r. Vital Code (when applicable)  
s. Record Identifier  
t. User Defined Fields (when desirable)  

2. Systems managing electronic records shall allow the user to specify whether or not an exact match of case is part of the search criteria.  

3. Systems managing electronic records shall also allow for specifying partial matches for multiple word fields such as subject and date and shall allow designation of “wild card” fields or characters.  

4. Systems managing electronic records that are automated shall allow searches using the **Boolean logic** operators, “and,” “or,” “not” and the mathematical operators, greater than (>), less than (<), equal to (=), and not equal to (/=).  

5. Systems managing electronic records shall present the user a list of records meeting retrieval criteria, or notify the user if there are no records meeting the retrieval criteria. The information contained in the list shall be user definable from the set of record profile attributes.  

6. Systems managing electronic records that are automated should provide to the user’s workspace (filename, location, or path name specified by the user), copies of electronic records, selected from the list of records meeting the retrieval criteria, in the format in which they were provided to the electronic records management system for filing.  

7. Systems managing electronic records can include other search methods and techniques, as the agency finds desirable.  

## XI. Transferring Records  

1. Systems managing electronic records shall, using the retention period for the record category, identify and present those records eligible for transfer. Transfer actions include:  

   a. Transfer of records to agency storage facilities or to the State Records Center  
   b. Transfer of records from one agency to another  

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c. Transfer of archival state records to the Texas State Library and Archives Commission

2. Systems managing electronic records shall, for records approved for transfer that are stored in the electronic records management system, copy the pertinent records and associated profiles to a custodian of information resources-specified filename, path, or device.

3. Systems managing electronic records shall, for records approved for transfer, provide the capability for only custodians of information resources to suspend the deletion of records and related profile until successful transfer has been confirmed.

XII. Destroying Records

1. Systems managing electronic records shall, using the retention period for the record, identify and present records that are eligible for destruction.

2. Systems managing electronic records shall, for records approved for destruction and for records that have been transferred, present a second confirmation, requiring the owner to confirm the destruction, before the destruction operation of the records is executed.

3. Systems managing electronic records shall delete records that are stored in their repository and have been approved for destruction, in a manner such that the records cannot be physically reconstructed.

4. Systems managing electronic records shall restrict execution of the records destruction commands to owners.

XIII. Access Control

1. Systems managing electronic records shall provide the capability to define different groups of users and access criteria. Systems managing electronic records shall control access to records based on groups as well as individuals meeting the access criterion/criteria.

2. Systems managing electronic records shall support multiple-user access.

3. Systems managing electronic records shall control access to transfer and destroy functions based upon user authorization.

4. Systems managing electronic records shall control access to audit functions based upon user authorization.
XIV. System Audits

1. Systems managing electronic records shall have audit utilities that provide an account of records capture, retrieval, and preservation activities to assure the reliability and authenticity of a record.

2. Systems managing electronic records shall have audit utilities that provide a record of transfer and destruction activities to facilitate reconstruction, review, and examination of the events surrounding or leading to mishandling of records, possible compromise of confidential information, or denial of service.

3. Systems managing electronic records shall provide the capability to store audit data as a record.

4. The following audit information shall be reported on demand:
   a. Total Number of Records
   b. Number of Records by Record Series Item Number (when applicable)
   c. Number of Accesses by Agency Item Number

5. The following audit information shall be logged for each delete operation:
   a. Record Identifier
   b. Agency Item Number
   c. User Account Identifier
   d. Date/Time
   e. Authorizing Individual Identifier (if different from User Account Identifier)

6. Systems managing electronic records shall allow only custodians of information resources to enable/disable the audit functions and to backup and remove audit files from the system.

XV. System Management Requirements

The following are functions typically provided by the operating system or a database management system. They are also considered requirements to ensure the integrity and protection of organizational records. They shall be implemented as part of the overall records management system even though they may be performed externally to systems managing electronic records.

1. **Backup of Stored Records.** The system shall provide the capability, as determined by the agency, to automatically create backup or redundant copies of the records as well as their metadata.

2. **Storage of Backup Copies.** The method used to backup the records shall provide copies that can be stored at separate location(s) to safeguard against loss of
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 trails. 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.

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**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 T exas A dministrative 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 definition 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 vendor 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 records.

**Vital State Record.** Any state record necessary to (A) the resumption or continuation of state agency operations in an emergency or disaster; (B) the recreation 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 messages 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

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