Moving the County Towards Electronic Records Keeping

A Roadmap for Change

Developed by
The Multnomah County Electronic Records Keeping Committee

June, 2004

This report is the result of work performed by the Electronic Records Keeping Committee, which first met in August, 2003. The mission of this committee was to develop a long range road map guiding the county towards the effective use of electronic records keeping systems, and to lessen the reliance on paper-based systems where feasible. Further details about the committee and its membership can be found in Appendix 1 at the end of this report.

The committee wishes to thank the many county employees who devoted their valuable time and expertise in making this report possible.

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- To effectively guide the county through this transition, the county needs policies which:
    - Reflect an on-going, high level commitment to change;
    - Coordinate effort across multiple disciplines and stakeholders; and
    - Ensure that resources are utilized in the most effective manner possible.
- This road map proposes a process of change which will move the county towards the above vision of electronic records keeping in a manner that is sensible, cost effective, and sustainable over time.

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- Public records requirements do not differentiate between electronic records and other record types. They primarily focus on the responsibilities of records custodians to provide access, make copies available, retain public records, and ensure records security.
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- Solutions include improved training for employees in public records responsibilities; review of existing systems to determine records keeping capabilities; and changes to the procurement process to encourage the acquisition of electronic records keeping systems.

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- County business processes are increasingly being carried out in an environment that is electronic and collaborative. These processes need to rely on records keeping systems that can verify outcomes and ensure obligations are met.
- Related records management and information technology policies are un-coordinated, and have not kept up with the increasing reliance on electronic processes. Better coordination of these policies will reduce waste and support sustainability goals.

- Solutions include establishment of an oversight committee to coordinate and develop policy; improved data gathering to track progress towards electronic records keeping and sustainability goals; and review of existing systems to identify opportunities for improvement in meeting goals.

2c) Environmental Scan

- Environmental factors such as stakeholder needs, and trends in the economy, technology, organization, and legal climate are having significant impacts on records keeping requirements. Electronic records keeping can help serve these needs through improved access, collaboration, information dissemination, and integration with other systems.
- A focus on records keeping policy and practice can provide stability and continuity to electronic records keeping systems by ensuring the value of electronic evidence over time, and by ensuring the ability to meet regulatory and audit requirements.

2d) Available Technologies

- Available technologies present both capabilities and barriers to effective records keeping. For this reason, hybrid solutions combining different technologies to enhance capabilities and offset barriers may be needed.
- The best approach is to seek opportunities where a particular technology can add value to a specific business need, rather than an organization wide "one size fits all" solution.

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- The Board of County Commissioners should establish, by resolution, an Electronic Records Oversight Committee (EROC) that has as its mission the development of an ongoing program to promote and encourage the use of electronic records keeping systems in county agencies.
- The EROC should consist of representatives of Information Technology, Records Management, Library Services, the Board of County Commissioners, and the line departments.
- The EROC should identify and compile county policies related to electronic records keeping, and coordinate the creation of policies and procedures where none exist.
- The EROC should develop criteria for quality electronic records keeping, and coordinate the regular and formal evaluation of county compliance with these criteria.
- The EROC should coordinate the development of educational and training programs relating to electronic records keeping.

- The EROC should annually report to the Board of County Commissioners progress towards electronic records keeping.

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- Establishing the records keeping capabilities of electronic systems currently in use in the county can reduce the reliance on paper records keeping systems. Yet, thoroughly analyzing all existing electronic systems would not be cost effective.
- A two-tiered "triage" approach is recommended for addressing the capabilities of existing systems:
    - The Electronic Records Oversight Committee (EROC) should select two to three systems for a full analysis of their electronic records keeping capabilities, based on criteria developed by the committee. Land Use Planning and SAP Timekeeping are two systems which have volunteered to undergo this analysis, and may offer significant opportunities for improvement.
    - Incorporate a review of electronic systems into the next retention schedule update cycle, sufficient to tag certain electronic systems for follow-up analysis as electronic records keeping systems.

3c) Establishing New Electronic Records Keeping Capabilities

- It is more cost effective to address electronic records keeping requirements as new systems are acquired, rather than attempting to retrofit older systems.
- Information Technology, Records Management, and Central Procurement and Contract Administration should work together to develop specifications that address records keeping requirements when acquiring new electronic systems, and which reward electronic records keeping systems which reduce reliance on hard copy records keeping. These specifications should be required in the formal acquisition of electronic systems costing over $75,000.
- Information Technology, Records Management, and Central Procurement and Contract Administration should develop a simple review process for the informal procurement of electronic systems under $75,000 which determines the records keeping capabilities and requirements of such systems.
- Data gathered from the procurement process should be reported to the Electronic Records Oversight Committee to track progress towards electronic records keeping; fine tune the analysis of existing systems; develop a list of approved electronic records keeping systems; and improve education of users of such systems.

Part 1: Introduction

Vision: Electronic records keeping should no longer be the exception, but the rule in Multnomah County.

Summary:

- The practice of electronic records keeping[1] is still in its infancy.
- Like many organizations, the county is transitioning from paper-based to electronic-based processes.
- While this transition continues to present challenges, practical models and tools are emerging to meet these challenges.
- To effectively guide the county through this transition, the county needs policies which:
    - Reflect an on-going, high level commitment to change;
    - Coordinate effort across multiple disciplines and stakeholders; and
    - Ensure that resources are utilized in the most effective manner possible.
- This road map proposes a process of change which will move the county towards the above vision of electronic records keeping in a manner that is sensible, cost effective, and sustainable over time.

Narrative:

The practice of electronic records keeping is still in its infancy, with realistic models of policy and technology only emerging within the past 5 years. Electronic records keeping requires a greater degree of planning and intervention to address issues that are simply taken for granted in a paper records keeping environment. For example:

- Paper is durable and does not have to be periodically migrated to maintain its records keeping features;
- Paper is eye-readable and does not require electric power or internet access to be reviewed;
- Electronic storage relies on both fragile media and constantly changing formats; and
- Obsolescence in any element of an electronic record can negate the whole, whether it is in the software, hardware, operating system, or storage media.

These factors become more critical over time, impacting the usefulness, accessibility, and evidential authenticity of electronic records.

Like most organizations, Multnomah County is undergoing a transition from paper records keeping to electronic records keeping. While many business processes are conducted electronically and recorded on paper, there has been little formal effort in the

[1] Terminology is important in discussing electronic records keeping, particularly since terms such as "archives" and "records keeping" can have different meanings in different disciplines and contexts. Appendix 4 includes a glossary for terms utilized in this report.

county to review the records keeping requirements of such processes in a manner that encompasses all elements of the system across all media and technologies. Consequently, users of such systems lack formal guidance or assurance on how or where their longer term records keeping needs will be met, whether via paper, electronically, or with other formats.

This lack of guidance creates the potential that paper based systems are being unnecessarily maintained, or that electronic records keeping capabilities are not being fully exploited. National trends show that while over ninety percent of *new* information is created in electronic format,[2] the amount of paper created continues to grow.

Models of policy and technology are emerging to address the challenges of electronic records keeping. While these models vary in approach[3], they generally seek to ensure that electronic records can serve as reliable evidence of business transactions; can continue to be accessible in a useful manner; can maintain their authenticity; and can maintain these requirements throughout the entire period of time they need to be retained. This time period can range from seconds to permanent retention requirements.

To meet these challenges, this road map proposes a process of change which will move the county towards the above vision of electronic records keeping in a manner that is sensible, cost effective, and sustainable over time. The road map:

- Connects information professionals from multiple disciplines with departments to ensure records keeping systems are reviewed across all media and technologies;
- Recommends the establishment high level oversight to track progress, coordinate effort, recommend policy, and ensure that quality records keeping continues to be a goal in transitioning to a greater reliance on electronic records keeping systems;
- Recommends improvements in training to educate users on how to effectively maintain electronic records and reduce reliance on paper;
- Recommends that electronic records keeping be included as part of normal performance auditing;
- Recommends that Information Technology, Records Management, Materiel Management, and the County Sustainability Program develop data gathering tools to report on progress towards electronic records keeping;
- Reviews existing records keeping systems to determine the best mix of media and technologies to meet records keeping needs, and to identify areas of improvement; and
- Recommends changes to the procurement process that encourage the acquisition of electronic records keeping capabilities, and rewards the reduction of paper.

The Electronic Records Keeping Committee believes that this roadmap lays a policy framework in which both new and existing records keeping systems can transition to

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[2] http://www.sims.berkeley.edu/research/projects/how-much-info-2003/execsum.htm#summary (accessed 2/23/04)

[3] InterPares [http://www.interpares.org/], University of Pittsburgh [http://www2.sis.pitt.edu/~rcox/FunReqs.htm], and NARA's Electronic Records Archives [http://www.archives.gov/electronic_records_archives/index.html] are the dominant conceptual models.

quality electronic records keeping systems over time, and in turn, reduce the reliance on paper records keeping.

Part 2: The Records Keeping Environment

Understanding the records keeping environment in Multnomah County helps lay the groundwork for effective policy decisions related to electronic records keeping. The following five sections describe the current records keeping environment in Multnomah County, and some of the challenges it presents:

- Section 2a describes public records requirements under which the county operates;
- Section 2b describes records related business processes and best practices;
- Section 2c summarizes an environmental scan of county programs conducted by the committee which identifies stakeholder needs, and summarizes the larger environment in which records keeping occurs; and
- Section 2d lists the major available non-paper based technologies associated with records keeping.

These sections raise policy issues which are addressed in greater detail in Part 3.

Section 2a: *The Records Keeping Environment: Public Records Requirements*

Summary:

- Public records requirements do not differentiate between electronic records and other record types.
- Public records requirements primarily focus on the responsibilities of records custodians to provide access, make copies available, retain public records, and ensure records security.
- Employees need to be trained on their responsibilities as public records custodians.
- To be effective, electronic systems need to provide the tools to enable employees to fulfill these responsibilities.
- Solutions include improved training for employees in public records responsibilities; review of existing systems to determine records keeping capabilities; and changes to the procurement process to encourage the acquisition of electronic records keeping systems.

Narrative:

Oregon's Public Records Law[4] (contained in ORS 192) does not differentiate between electronic records and other record types. Consequently, custodians of

[4] For a full treatment of Oregon's Public Records Law, see the *Attorney General's Public Records and Meetings Manual*, Oregon Department of Justice, 2003.

electronic public records have the same responsibilities as custodians of more traditional public records. Under the public records law, custodians must provide access to non-exempt records in their custody, allow copies to be made of those records, maintain them for their legal retention period, and provide for the security of the records.

Access: Unless records are exempted from disclosure by state or federal laws or rules, custodians must make them accessible to anyone who requests them. If records contain both exempt and non-exempt information, the exempt information must be redacted and the non-exempt information made available for inspection.

Copies: Custodians are required to both provide certified copies of public records, if requested, and to provide requestors with the opportunity to make their own copies of public records, subject to reasonable conditions. Custodians may charge reasonable fees for copies.

Retention: Public records can only be destroyed under the authority of the State Archivist. The mechanism used to authorize destruction is a retention schedule. This document describes types of records and prescribes the minimum time that they must be retained before destruction. Some records are not destroyed and are retained permanently as county archives.

Security: Custodians of public records are required to maintain them in a manner that protects the records' integrity. The federal Health Insurance Portability and Accountability Act (HIPAA)[5] security rule goes into effect in 2005. It specifies certain security measures for public records containing protected health information.

Currently, many employees are not aware of their responsibilities as public records custodians. For example, many employees are not aware that e-mail can be a public record. In addition, many employees confuse the issue of media with the issue of whether or not a particular piece of information is a record. In many such instances, paper is considered the "real" record, not electronic information. Note that in a networked environment, the responsibilities for many records keeping requirements fall on individual employees at their desktops, as opposed to the central filing systems often prevalent in paper records keeping.

In addition, many current electronic systems may not provide the tools necessary for employees to effectively utilize them as electronic records keeping systems. This may be due to a lack of policy direction and/or a lack of technical capability. Particularly challenging is the ability to provide these tools consistently over time in an environment of continual change and obsolescence.

Solutions:

- Section 3a recommends enhanced training to educate employees on their responsibilities as public records custodians.

[5] Full text of the rule can be found at http://www.hhs.gov/ocr/combinedregtext.pdf.

- Section 3b describes a process to review the records keeping capabilities of existing electronic systems.
- Section 3c recommends changes to the procurement process that encourage the inclusion of records keeping capabilities in new electronic systems.

Section 2b: *The Records Keeping Environment: Business Processes and Best Practices*

Summary:

- County business processes are increasingly being carried out in an environment that is electronic and collaborative.
- For these processes to be effective, they need to rely on records keeping systems that can verify outcomes and ensure obligations are met.
- Related records management and information technology policies are un-coordinated, and have not kept up with the increasing reliance on electronic processes.
- Better coordination of these policies will reduce waste and support sustainability goals.
- Some issues will remain unresolved, due to the early stage of development of electronic records keeping in the world at large.
- Solutions include establishment of an oversight committee to coordinate and develop policy; improved data gathering to track progress towards electronic records keeping and sustainability goals; and review of existing systems to identify opportunities for improvement in meeting goals.

Narrative:

Business processes throughout the county are increasingly electronic and collaborative. The SAP enterprise system is an example of how a variety of business processes that were managed separately and that relied heavily on paper documentation are now managed in a unified system. Other county business processes have implemented electronic systems that either augment or replace traditionally paper-based ones. The County Surveyor's SAIL system, County Sheriff's inmate records and booking systems, and WIC Clinics' TWIST system are examples in existence today. Additionally, large information systems – like those in the District Attorney's Office, the Health Department's Epic system, and the Parole and Probation system – offer opportunities for enhanced electronic records keeping. The SAP planning roadmap has identified a business warehouse application as a critical application and the County Library is piloting a content management application.

Effective business processes and best practices rely on trustworthy records keeping systems to verify that necessary outcomes are achieved and that obligations to both

internal and external stakeholders are met.[6] In the county, trustworthy records keeping is often both paper based and electronic. For example, users of SAP still rely on paper to meet many of their documentation needs. This may be the best solution, given the prevailing technology in use in any given system. However, it is difficult to ascertain appropriate solutions due to overall policy disconnects in the area of records keeping.

Records management and information technology policies are not coordinated, and have not kept up with the increasing reliance on electronic processes.

Currently, there is a full complement of policies, procedures, and standards developed by and for **information technology management**.[7] Yet, the integration of public records law requirements – especially retention and access – into these documents is incomplete and uncoordinated. Related executive rules and administrative procedures date from the early 1980's, are outdated, and approach records keeping and electronic information systems without a cohesive plan.[8] Electronic archiving rules focus on maintaining backup systems for recovery or business continuation purposes, not on the maintenance of records keeping systems.

Policies developed by and for **records management** are similarly un-integrated. Retention schedules are effective and simple when dealing with paper records, but little coordinated guidance has been developed to apply such policies to electronic systems. In addition, little effort has been made to identify "record copy"[9] across systems, with the result that many paper records keeping systems may be duplicating electronic records keeping systems.

In many cases, formal record keeping policies simply have not been developed. This is indicated in the results of a survey conducted by the committee of county programs regarding the existence of formalized information procedures, shown in Appendix 2. While retention policies are well documented (primarily for paper records), the existence of other information management policies critical to quality records keeping varies. Access, privacy, security, and data element structure are reasonably well-documented, while migration, backup, offline storage, and business continuation are not. Procedures are better documented for immediate needs, less well documented for long term needs. This needs to improve if the county is going to increasingly rely on electronic means for the ongoing maintenance of county records.

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[6] The international standard ISO 15489 (2002), *Information and documentation - Records management*, focuses on the business principles behind records management and how organizations can establish a framework to enable a comprehensive records management program.

[7] See http://mint.co.multnomah.or.us/dbcs/it/policies_procedures.shtml and http://mint.co.multnomah.or.us/dbcs/it/standards.shtml for current information.

[8] The following executive rules exist: 104 - Creation of Data Processing Authority (1980); 152 – Information Processing Practices (1982); 166 – Data Processing Plan (1984); 260 - Establishment of the ITO (2001); 266 – Complying with Public Records Law Requests form the Media (2002); 270 – Personnel Rules revision, includes appropriate use of information technology and use of email (2002); 273 – Web Design Consistency (2002).

[9] Record copy is defined in OAR 166-005-0010(7) as "the official copy of a public record when multiple copies exist".

Better coordination of information technology and records management policies will reduce waste and support sustainability goals. There is a relationship between the implementation of effective electronic records keeping practices and the implementation of **sustainable development practices**. Records keeping, from both resource consumption and environmental pollution, has a significant impact on the environment.[10] Paper reduction is an approved policy goal of the Board of County Commissioners. Resolution No. 03-092 resolves "To reduce overall printing and copy paper consumption by 10% by September 2005 and 15% by 2008 from fiscal year 2001 levels."[11] Yet the volume of paper records stored in the county Records Center grew 6% during fiscal year 2002-2003.

There has also been a steady increase in electronic storage demands. Growth in e-mail and other sources of electronic records are straining the ability of information technology to maintain control.[12] While better coordination of policies is unlikely to make the county "paper-less" in the foreseeable future, it can reduce the demand for resources for both paper and electronic records maintenance by better focusing records keeping practices where they are most effective and eliminating unnecessary duplication and waste.

Progress has been made with recent initiatives to provide best practice guidance for the management of email, HIPAA security issues surrounding electronic records keeping systems, the investigation of SAP records retention requirements, and the development of a storage and migration plan for county payroll records. Such efforts indicate the potential to successfully develop effective electronic records keeping practices, and need to be expanded.

However, it is important to remember that some issues will remain unresolved, due to the early stage of development of electronic records keeping in general. There are some standards for the storage of electronic records (most notably standards for digital imaging systems issued by the Oregon State Archives[13]), but nationally most best practices for storage media and format are not standardized and questions still remain about how best to preserve electronic records. Electronic preservation of information becomes increasingly difficult as the complexity of an electronic records "object" increases (such as in a complex word processing document), and as the required retention period increases.

Solutions:

- Section 3a recommends the establishment of an oversight committee to coordinate disparate records keeping policies, and to develop policies where gaps exist. In

[10] "Measurable Impacts of Recordkeeping on the Environment," Paper presented at the Annual Meeting of the Northwest Archivists. Corvallis, Oregon, 2002
[11] Resolution 03-092, *Adopting a Policy for Paper and Paint Purchasing and Setting Goals for Paper Use,* adopted 19 June 2003.
[12] For example, help desk response records have increased 788% in number since November, 2002.
[13] See http://arcweb.sos.state.or.us/rules/OARS_100/OAR_166/166_017.html for full text of rules. Standards for microfilm are also located in the State Archives' administrative rules.

addition, recommendations are made to track progress through data gathered by Records Management, Information Technology, the County Sustainability Program, and Materiel Management.
- Section 3b recommends the review of existing systems for compliance with records keeping policies. One system recommended for possible review – the SAP timekeeping system – may offer good possibilities to reduce paper consumption.

Section 2c: *The Records Keeping Environment: Environmental Scan*

Summary:

- Environmental factors such as stakeholder needs, and trends in the economy, technology, organization, and legal climate are having significant impacts on records keeping requirements.
- Stakeholder needs must be recognized and maintained in a climate of significant, on-going change.
- Electronic records keeping can help serve these needs through improved access, collaboration, information dissemination, and integration with other systems.
- A focus on records keeping policy and practice can provide stability and continuity to electronic records keeping systems by ensuring the value of electronic evidence over time, and by ensuring the ability to meet regulatory and audit requirements.

Narrative:

The committee conducted a survey of county programs to determine stakeholder needs and issues in the larger environment that would have an impact on records keeping issues. Detailed results of this survey can be found in Appendix 2. The following briefly summarizes the surveys results. Results are ranked in terms of response, from higher response rates to lower.

Stakeholder needs: Survey respondents identified the top four stakeholders associated with their programs as being county employees, other governments, public clients and customers, and other county agencies. The primary information needs of these stakeholders included:

- Reliable evidence of actions taken;
- Ease of access to information, both internally and externally;
- Ease of dissemination of information (publication);
- Ability to meet regulatory and audit requirements;
- Ability to integrate with other systems;
- Ability to copy or reproduce information; and
- Ability to collaborate with other partners.

Larger Environmental Factors: Survey respondents also indicated factor in the overall environment which were impacting their programs. These factors included:

- Budgetary instability;
- Organizational change;
- Changing technologies;
- New and changing legislative and legal requirements, such as HIPAA;
- Social trends relating to the changing workforce, and an increasingly multi-cultural and multi-lingual society; and
- Economic trends leading to increasing service demands.

The above environmental factors can be summarized by one word: *change*. *Change* in the resources available to meet increasing program demands; *change* in the programs themselves and how they relate to the larger organization; *change* in the rules under which programs operate; *change* in both employees and the populations those employees are serving; *change* in the information needs of internal and external customers; and *change* in the technologies utilized to meet those needs.

From a records keeping standpoint, these changes represent both opportunities and challenges. When information is current and active, quality electronic systems offer unparalleled opportunities to respond to change with a rapidity and flexibility that more traditional systems can not begin to match. It is records keeping which provides the continuity within such structures to meet evidentiary and legal requirements, and to provide corporate memory. Yet it is that very change environment which presents longer term challenges in maintaining records authenticity and integrity. This, again, underlines the need for a records keeping policy framework that acknowledges and begins addressing these issues.

Solutions:

- Among the duties recommended for the oversight committee outlined in Section 3a is the coordination and tracking of records keeping policies throughout the county. The oversight committee should coordinate past policies, as well as oversee the development of new policies as the need arises, providing both a stable policy foundation, and the ability to adjust as needed in a climate of rapid and continual change.

Section 2d: *The Records Keeping Environment: Available Technologies*

Summary:

- Available technologies present both capabilities and barriers to effective records keeping.
- For this reason, hybrid solutions combining different technologies to enhance capabilities and offset barriers may be needed.
- The best approach is to seek opportunities where a particular technology can add value to a specific business need, rather than an organization wide “one size fits all” solution.

Narrative:

The committee gathered information on the most significant, non-paper based technologies currently in use, and their attributes as records keeping systems. This information is presented in detail in Appendix 3.

As shown in the appendices, no single technology offers a "universal solution" to all records keeping problems. Because of this, paper will continue in use for the foreseeable future. In addition, hybrid solutions combining different technologies will represent many of the records keeping systems developed in the coming decade. For example, microfilm is commonly used to back up imaging systems utilized for records with long term retentions. Electronic records management systems often are combined with office software systems to provide a greater degree of control than the office software is capable of providing on its own.

Most cost savings from implementing new technologies will come from improvements in workflow and process re-engineering enabled by that technology. The reduction of paper is rarely the principle gain derived from implementing such electronic systems. Because of this, the best approach is to seek opportunities where specific tools can meet well defined business needs, rather than seek the application of a particular paper reduction technology to the whole organization.

Solutions:

- Section 3b recommends utilizing the retention scheduling process to review the records keeping capabilities of existing systems, and to seek opportunities for improvements through the implementation of electronic records keeping technologies.

Part 3: Recommendations

The above sections describe a records keeping environment marked by change, complexity, and uncertainty. In such an environment, it makes sense to develop fundamental policies which:

- Are easy to implement. This helps lower resistance to change;
- Require low start up costs – a realistic choice in the current budgetary climate;
- Take advantage of processes already in place, such as the formal procurement process and retention scheduling;
- Educate stakeholders to make intelligent choices by clarifying disconnected policies and improving training efforts; and
- Develop an ongoing knowledge base for future direction and development by establishing data gathering methods to report progress.

Coordinating policies and effort, maintaining a high level focus on electronic records keeping, educating stakeholders, and tracking progress will lead to increasingly effective choices over time. Recognizing the records keeping capabilities of existing electronic

systems, and building records keeping capabilities into new electronic systems will reduce reliance on hard copy records keeping practices.

Electronic records keeping should become the "normal course of business[14]" in Multnomah County. Many of the policy recommendations made are incremental in nature and build on processes already in place. They seek to maximize results with minimal demands on resources by creating a foundation for future developments in electronic records keeping. In addition, they recommend methods of tracking progress which can be used to make future resource allocation decisions:

- Section 3a addresses policy oversight, continuity and education through the establishment of an Electronic Records Oversight Committee charged with guiding the county's efforts towards electronic records keeping;
- Section 3b recommends ways to establish the records keeping capabilities of existing electronic systems; and
- Section 3c recommends methods to encourage the inclusion of electronic records keeping capabilities in new electronic systems.

Section 3a: *Recommendations: Policy Oversight, Continuity, and Education*

Summary:

- The Board of County Commissioners should establish, by resolution, an Electronic Records Oversight Committee (EROC) that has as its mission the development of an ongoing program to promote and encourage the use of electronic records keeping systems in county agencies.
- The EROC should consist of representatives of Information Technology, Records Management, Library Services, the Board of County Commissioners, and the line departments.
- The EROC should identify and compile county policies related to electronic records keeping, and coordinate the creation of policies and procedures where none exist.
- The EROC should develop criteria for quality electronic records keeping, and coordinate the regular and formal evaluation of county compliance with these criteria.
- The EROC should coordinate the development of educational and training programs relating to electronic records keeping.
- The EROC should annually report to the Board of County Commissioners progress towards electronic records keeping.

Narrative:

[14] "Normal course of business" is a common records management term referring to the regular documented implementation of records management policies. Insuring that records management practices are carried out in the normal course of business reduces liability and improves the trustworthiness of records keeping systems.

The Board of County Commissioners should establish an Electronic Records Oversight Committee (EROC) that has as its mission the development of an ongoing program to promote and encourage the use of electronic records keeping systems in county agencies. The EROC would be instrumental in coordinating the efforts of the groups primarily responsible for records keeping in Multnomah County:

- *County management and staff,* identified in public records laws as *records custodians* due to their roles as creators, users, and maintainers of public records;
- *Records Management*, responsible for records retention scheduling, records center storage, archives management, public records and records management training, and advice and assistance on any records issues of interest to county staff; and
- *Information Technology*, responsible for system acquisition, system design and maintenance, backup and restoration, data storage, data migration, and data conversion.

Coordinating the efforts of these groups in a manner that is consistent over time is essential to developing electronic records keeping systems which are capable of replacing paper records keeping systems.

The EROC should be established by a resolution of the Board of County Commissioners. This resolution should identify the group's membership, state its mission, specify the scope of its duties, and present mileposts for group actions.

The committee's membership should include representatives of Information Technology, Records Management, Library Services, the Board of County Commissioners, and the line departments. Records Management can provide staff support for the group. Information Technology can provide web site development and maintenance.

The EROC should identify and compile county policies related to electronic records keeping, and coordinate the creation of policies and procedures where none exist. The committee must develop an overarching policy statement regarding electronic records keeping. "The objective of the policy should be the creation and management of authentic, reliable, and useable electronic records, capable of supporting business functions and activities for as long as they are required."[15] The policy statement should encourage the creation of quality electronic records keeping systems that meet these standards, and that reduce reliance on paper records keeping systems where feasible.

The EROC is also responsible for maintaining supporting documentation, especially county policies and procedures, necessary to insure that electronic records keeping meets county evidential and informational needs. The committee will not have to develop all of these policies. It should be able to identify existing policies and procedures related to records management, information technology, information privacy, information security, sustainability, and emergency management.

[15] ISO 15489-1:2001, sect 6.2, p. 5.

The EROC should develop criteria for quality electronic records keeping, and coordinate the regular and formal evaluation of county compliance with these criteria. The committee should identify standards and best practices related to electronic records keeping. These documents may be created by industry, professional groups, standards making bodies, or other organizations. Regardless of their source, the EROC should insure that the most current and appropriate standards and practices are used to support county polices.

Evaluation of electronic records keeping throughout the county should be regularly conducted to establish that electronic records keeping systems are adequately supporting stakeholder needs; are reducing records keeping costs (primarily through storage reduction); are meeting regulatory requirements; and are promoting sustainable office practices.

Utilizing relevant standards and best practices, the EROC should coordinate the efforts of program experts to develop the criteria necessary for evaluating success. This criteria should establish baselines, set goals, and devise measurement techniques. In addition, the EROC should work with the County Auditor to determine if criteria can be developed for performance audits that evaluate the effectiveness of electronic records keeping practices, and their conformity with established county policies and procedures.

To determine the effectiveness of electronic records keeping in reducing both hard copy and electronic storage costs, additional data should be reported to the EROC:

- *Materiel Management* should develop methods of tracking paper use and comparing it with compliant electronic records keeping systems;
- *Records Management* should develop methods of measuring paper records stored and destroyed by county agencies, particularly noting those areas where electronic records keeping practices have been implemented;
- *Information Technology* should develop methods of tracking electronic storage (both fixed and removable) and comparing it with compliant electronic records keeping systems; and
- *The County Sustainability Program* should develop measures that evaluate the adoption of compliant electronic records keeping systems with sustainable office practices, including energy use, paper use, and electronic consumables use.

The EROC should coordinate the development of educational and training programs relating to electronic records keeping.

An EROC web site should be developed and maintained, which compiles relevant policies, procedures, standards and best practices, and make them readily available to county managers and staff, as well as records management and information technology personnel. The web site should also provide linkages to relevant training resources.

Employee training should include records keeping requirements and the responsibilities of public employees under the public records law. The EROC should coordinate with Human Resources to incorporate such training into orientation training for new

employees, and mandatory training for existing employees. This training should quickly overview public records law, the responsibilities of employees, and provide contact information for the Records Program, IT, and the county attorney and resources available on the MINT. Further training on electronic information systems, public records policy, and records management principles should be developed in coordination with Information Technology, the County Attorney, and Records Management.

The EROC should annually report to the Board of County Commissioners progress towards electronic records keeping. The goal of this reporting is to allow both the Board of County Commissioners, and a broad spectrum of people to review the activities and accomplishments of the EROC. The committee will need to devise a structure for including both statistical information gathered from the various program experts, anecdotal information about successes and failures, analysis of how current goals have been met, and the identification of new goals.

Section 3b: *Identifying Existing Electronic Records Keeping Capabilities*

Summary:

- Establishing the records keeping capabilities of electronic systems currently in use in the county can reduce the reliance on paper records keeping systems.
- Thoroughly analyzing all existing electronic systems would not be cost effective.
- A two-tiered "triage" approach is recommended for addressing the capabilities of existing systems:
    - The Electronic Records Oversight Committee (EROC) should select two to three systems for a full analysis of their electronic records keeping capabilities, based on criteria developed by the committee. Land Use Planning and SAP Timekeeping are two systems which have volunteered to undergo this analysis, and may offer significant opportunities for improvement.
    - Incorporate a review of electronic systems into the next retention schedule update cycle, sufficient to tag certain electronic systems for follow-up analysis as electronic records keeping systems.

Narrative:

Establishing the records keeping capabilities of electronic systems currently in use in the county may reduce the reliance on paper records keeping systems. This has never been done in any systematic way**.** Yet, many electronic systems may contain important evidence of county activities. County programs must be able to determine if their electronic systems are maintaining adequate records.
Thoroughly analyzing all existing electronic systems would not be cost effective. ISO Standard 15489-1 lays out a methodology to analyze records keeping capabilities.[16]

[16] ISO 15489 identifies the following steps to establish the records keeping capabilities of existing systems: 1) Perform a preliminary investigation of the organization's administrative, legal, business and social contexts. (2) Analyze the organization's business activities. (3) Identification of requirements for records.

Applying this methodology to all county electronic systems would be time consuming, given the number of electronic systems involved,[17] and the complexity of analysis and retro-fitting required. In addition, it is likely that many existing systems are not capable of creating electronic records or maintaining them for the retention period required. Many are older systems installed before records keeping features were incorporated (a relatively recent phenomena), or are user-created utilizing desktop software, with little regard for records keeping functions.

A two-tiered "triage" approach is recommended for addressing the capabilities of existing systems:

***Approach One*: The Electronic Records Oversight Committee (EROC) should select two to three systems for a full analysis of their electronic records keeping capabilities, based on criteria developed by the committee.** The analysis of these systems should be carried out by associated county managers and staff, Records Management, and Information Technology under the auspices of the EROC. The systems selected should be large and complex enough to serve as an effective test of the analysis process, but should also have a reasonable chance of successful analysis and implementation. Other attributes the committee should use for selection include the risk involved in not maintaining adequate records, the volume of paper and electronic media created by the system, the level of access and use the system receives, retention requirements, inclusion of vital records, and migration/conversion needs.

During the course of our discussions, the Electronic Records Keeping Committee identified two volunteers for this initial process of review:

- *Land Use Planning* is developing a project to convert to electronic records keeping, and to reduce their reliance on hard copy records keeping. Funding is available to implement this project. This would provide an opportunity to develop criteria and techniques useful in analyzing other electronic systems' capabilities, and ensure that the project results in the quality electronic records keeping capabilities needed.
- *The SAP Timekeeping process* currently relies on paper backup. It is possible that a review of records keeping policies and practices may be able to reduce or eliminate this reliance on paper timesheet backup entirely.

***Approach Two*: Incorporate a review of electronic systems into the next retention schedule update cycle, sufficient to tag certain electronic systems for follow-up analysis as electronic records keeping systems.** County retention schedules are reviewed and updated every five years, in accordance with Oregon State Archives requirements. The process of review focuses on how county records support the ability of each county function to meet operational, legal, fiscal, and historical requirements. Records Management should work with Information Technology to incorporate into this process a review of the electronic systems supporting each function, and the ability of

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(4) Assess existing systems. (5) Identify strategies for satisfying records requirements. (6). Design and implementation of a records system. (7) Post-implementation review of record system.

[17]For example, there are an estimated 3,000 Access databases impacted by HIPAA compliance issues.

these electronic systems to maintain records for their required retention period, thereby operating as electronic records keeping systems.

While not a thorough review, this should be sufficient to identify electronic systems that are (a) not compliant and needing updating, or (b) offer the potential to be compliant electronic records keeping systems, and need follow-up. Results of this process should be reported to the EROC for tracking and reporting purposes. Results should also be shared with agency managers and staff, to assist in making intelligent decisions on process improvements, as well as offering information valuable in allocating resources for future projects in electronic records keeping.

Section 3c: *Recommendation: Establishing New Electronic Records Keeping Capabilities*

Summary:

- It is more cost effective to address electronic records keeping requirements as new systems are acquired, rather than attempting to retrofit older systems.
- Information Technology, Records Management, and Central Procurement and Contract Administration should work together to develop specifications that address records keeping requirements when acquiring new electronic systems, and which reward electronic records keeping systems which reduce reliance on hard copy records keeping.
- These specifications should be required in the formal acquisition of electronic systems costing over $75,000.
- Information Technology, Records Management, and Central Procurement and Contract Administration should develop a simple review process for the informal procurement of electronic systems under $75,000 which determines the records keeping capabilities and requirements of such systems.
- Data gathered from the procurement process should be reported to the Electronic Records Oversight Committee to track progress towards electronic records keeping; fine tune the analysis of existing systems; develop a list of approved electronic records keeping systems; and improve education of users of such systems.

Narrative:

It is more cost effective to address electronic records keeping requirements as new systems are acquired, rather than attempting to retrofit older systems. One way to do this is through the procurement process.

Information Technology, Records Management, and Central Procurement and Contract Administration should work together to develop specifications that address records keeping requirements when acquiring new electronic systems. These requirements include:

- ensuring that electronic systems are capable of providing information sufficient to successfully complete transactions, make decisions, and meet obligations associated with the functions involved;
- ensuring that electronic systems are capable of maintaining authentic records of those transactions, decisions, and obligations;
- ensuring that electronic systems can maintain these records for the entire time period required as reflected in the function's records retention schedule; and
- ensuring that both internal and external stakeholders can access records for the entire time the records need to be retained, and that copies of records can be made available upon request.

Proposals for electronic systems should also include language that awards proposals which successfully reduce reliance on hard copy. Given the current state of technology, certain electronic systems may not be capable of significantly reducing hard copy without significant modification and expenditure. Incorporating hard copy reduction into the scoring of such proposals, as opposed to requiring it, allows other business needs to be balanced with the goal of reducing paper.

These specifications should be required in the formal acquisition of electronic systems costing over $75,000. Vendor responses to formal bids should be reviewed by Information Technology and Records Management to determine the degree to which systems are compliant with records keeping standards, and the extent to which systems replace hard copy systems. The results of this review can be reported back to the particular RFP review committee for scoring.

Information Technology, Records Management, and Central Procurement and Contract Administration should develop a simple review process for the informal procurement of electronic systems under $75,000 which determines the records keeping capabilities and requirements of such systems. This review process should not strain resources or needlessly slow procurements, yet should gather sufficient information to address important records keeping issues when they arise. A self-service questionnaire posted on the MINT can walk users through a series of simple questions which determine whether the particular system being acquired can or should serve as an electronic records keeping system. Responses can be forwarded to appropriate information technology and records management professionals as warranted for follow-up. A similar self-service model for minority/women/emerging small business review has worked well in the county, without needlessly slowing procurements.

To facilitate the formal and informal procurement processes described, raining tools will need to be developed for procurement liaisons throughout the county. Familiarizing them with the electronic records keeping issues involved, and how those issues tie to related procurement processes, will go a long way in ensuring the above processes are followed, and add value.

Data gathered from both formal and informal processes should be reported to the EROC to track progress in moving towards quality electronic records keeping, and

away from reliance on hard copy records keeping systems. Such data can be used by the committee to fine tune and adjust specifications, procurement processes, and system criteria to ensure standards are current. Data from these procurement processes can also be used to develop lists of electronic systems which have been approved for records keeping functions. This data can also be posted to the MINT, further facilitating the procurement process, and educating users on the choices available to them. Finally, data gathered in the procurement process can help in developing methodologies in reviewing existing systems, and in improving training approaches.

Appendix 1
The Electronic Records Keeping Committee
Mission and Membership

Mission

The impetus for the Electronic Records Keeping Committee was a recommendation of the Ford Building Tenants Space Needs Work Group, chaired by Commissioner Lisa Naito. The Electronic Records Keeping Committee was established for the purpose of developing a long range road map guiding the county towards the effective use of electronic records keeping technologies, and to lessen the reliance on paper-based systems where feasible. The committee is chaired by the Records and Distribution Services Manager and consists of records management staff, information technology staff, departmental representatives, and technical advisors as needed. Among the issues the committee reviewed in developing its recommendations were best practices, available technologies, stakeholder needs, and records keeping requirements. The committee is expected to have a road map developed by June 2004 and should have statutory change proposals prepared prior to the 2005 session of the Oregon Legislature.[18]

Membership

Steering Committee

Dwight Wallis, Chair, County Records Program
Karen Harris, ITO
Maureen Jackson, ITO
June Mikkelson, Library Services

General Members

Mohanned Abu Zayed, Human Resources
Diba Adams, District Attorney's Office
Michelle Barwick, Budget/Finance/Tax
Terry Baxter, County Records Program
Michelle DeShazer, Community Justice
Stuart Farmer, Community Services
Chuck French, District Attorney's Office
Cyndi Freiermuth, Community Justice
Cathy Gates, Health
Joyce Griffin, Sheriff's Office
Rebecca Gunther, Human Resources
Karen Marsala, DCHS
Steve Robertson, ITO
Lavoris Robinson, Community Justice
Dana Schnell, OSCP
Mike Waddell, Business Services
Ron Yann, Shared Services

[18] adopted from *Ford Building Tenants Space Needs Report*, May 5, 2003, p. 5.

Appendix 2
Survey of Stakeholders, Environment, and Procedures

To gain a better understanding of the overall environment in which records keeping occurs in the county, committee members were asked to gather information from their respective organizations on stakeholders and their information needs, environmental factors affecting programs, and the extent to which formalized procedures exist in programs for electronic records keeping(footnote referring to stakeholder form and instructions). Sixty-two responses were received: 36 responses (58%) were internal services focused on human resources, administration, finance, and other support functions; 25 responses (40%) involved direct service to the public, such as public health clinics or library services; and one response entailed both (Finance and Taxation). While the number of programs that submitted responses was neither broad nor consistent enough to generate detailed statistical analysis, the responses received were consistent enough that certain common themes emerged.

1. Stakeholders. Respondents were asked to identify the top three stakeholders each program dealt with, and what role they played. The types of stakeholders identified and their roles are summarized in Table One.

Table 1: Stakeholder Roles

	Total		Svc/Info Users		Svc/Info Provider		Regu-lators		Audi-tors	
External Stakeholders:										
Govt, Other Agencies:	34	17%	31	16%	11	6%	26	13%	18	9%
Public, Customers, Clients:	28	14%	28	14%	7	4%	1	1%	3	2%
Contractors:	13	7%	5	3%	11	6%	1	1%	2	1%
External Staff:	11	6%	5	3%	9	5%		0%		0%
Funding Sources:	5	3%	5	3%		0%	4	2%	5	3%
Boards	4	2%	4	2%	3	2%	1	1%	1	1%
Auditors	2	1%	2	1%	1	1%		0%	2	1%
Union	2	1%	2	1%	1	1%		0%		0%
Financial Institutions	1	1%		0%		0%	1	1%	1	1%
Media	1	1%	1	1%		0%		0%		0%
Volunteers	1	1%	1	1%	1	1%		0%		0%
	102	**52%**	**84**	**42%**	**44**	**22%**	**34**	**17%**	**32**	**16%**
Internal Stakeholders:										
Employees/Cnty Staff/Mgmt:	65	33%	56	28%	40	20%	6	3%	8	4%
County Agencies	23	12%	20	10%	14	7%	2	1%	1	1%
Boards	6	3%	5	3%	2	1%	1	1%	1	1%
Union	2	1%	2	1%	1	1%	1	1%		0%
	96	**48%**	**83**	**42%**	**57**	**29%**	**10**	**5%**	**10**	**5%**
Totals:	***198***		***167***	***84%***	***101***	***51%***	***44***	***22%***	***42***	***21%***

Stakeholder needs are summarized in Table Two.

Table 2: Stakeholder Information Needs

	Total		Evidence		Info Seeking Ref/Research		Interactive Communication		Publication/ Dissemination		Collaboration	
External Stakeholders:												
Govt, Other Agencies:	34	17%	31	16%	15	8%	8	4%	21	11%	12	6%
Public, Customers, Clients:	28	14%	22	11%	14	7%	7	4%	12	6%	6	3%
Contractors:	13	7%	10	5%	4	2%	5	3%	7	4%	4	2%
External Staff:	11	6%	11	6%	1	1%		0%	6	3%	6	3%
Funding Sources:	5	3%	5	3%	4	2%	3	2%	4	2%	3	2%
Boards	4	2%	2	1%	3	2%	2	1%	2	1%		0%
Auditors	2	1%	2	1%	1	1%	2	1%	1	1%	2	1%
Union	2	1%	2	1%	2	1%	2	1%	2	1%	1	1%
Financial Institutions	1	1%	1	1%	1	1%		0%		0%		0%
Media	1	1%		0%		0%		0%	1	1%		0%
Volunteers	1	1%	1	1%		0%		0%		0%		0%
	102	**52%**	**87**	**44%**	**45**	**23%**	**29**	**15%**	**56**	**28%**	**34**	**17%**
Internal Stakeholders:												
Employees/Cnty Staff/Mgmt:	65	33%	54	27%	30	15%	22	11%	35	18%	16	8%
County Agencies	23	12%	17	9%	16	8%	13	7%	10	5%	10	5%
Boards	6	3%	3	2%	3	2%	6	3%	3	2%	3	2%
Union	2	1%	2	1%	2	1%	2	1%	1	1%	1	1%
	96	**48%**	**76**	**38%**	**51**	**26%**	**43**	**22%**	**49**	**25%**	**30**	**15%**
Totals:	***198***		***163***	***82%***	***96***	***48%***	***72***	***36%***	***105***	***53%***	***64***	***32%***

Not surprisingly, stakeholder roles and needs reflected the requirements of a public records keeping system.

Employees (internal staff and management) appear as the largest stakeholder group by a fairly significant degree, with *Government* (external), *Public/Clients* (external), and *Other County Agencies* (internal) clustered fairly close together below employees.

Employees are shown mainly as users and providers of information. Their requirements rest primarily in the area of needing evidence of business processes, rights, events and obligation, as well as the publication/dissemination of information. To meet these requirements, electronic records keeping systems need to capture and maintain reliable evidence, while allowing that information to easily be accessed and disseminated.

Government is shown as playing roles both as users of information, and as regulators and auditors. Government also shows a high need for evidence and publication. To meet these

stakeholder needs, electronic records keeping systems must easily provide reliable evidence in a manner that complies with specific regulatory and audit requirements. Such systems may need to integrate into a larger governmental system as well.

Public clients and customers play roles primarily as users of information. They need reliable evidence, but also need to research and disseminate that information. To meet these stakeholder requirements, electronic records keeping systems need to maintain reliable evidence over time, and ensure it is both accessible and reproducible.

County agencies are shown as primarily users and providers of information. This group of stakeholders shows the broadest range of needs: evidence, information seeking, publication/dissemination, interaction, and collaboration. Clearly identifying which organization has the responsibility to maintain record copy[19] and ensuring that information is readily available in appropriate formats to partners can reduce the amount of duplication of effort in a given system, due to the collaborative nature of the processes involved. However, not addressing such issues impacts the quality of the records as evidence: who is responsible for maintaining the evidence for the whole, and how is that evidence maintained in a dynamic environment?

2. Environmental Scan. The dynamic nature of the county records keeping environment is further underscored by the responses received regarding environmental factors which are impacting programs. Committee members were asked to check off a number of environmental factors impacting their programs, and to provide comments when appropriate. The following summarizes these responses and comments, starting with the factors most frequently cited as having an impact:

a) Budgetary (54 responses): Budgetary instability was the largest single environmental factor cited. Comments cited decreasing revenues, increasing layoffs, and additional workloads on remaining staff. Only one respondent cited a stable budget.

b) Organizational (50 responses): Organizational change was the second most cited environmental factor. Changes related to shared services, departmental restructuring, employee turnover, and changes in departmental leadership are mentioned. These changes impact interrelationships with other programs, employee seniority, as well as staff assignments and duties. Four respondents cited records keeping impacts in continuity and accuracy. Only two respondents cited a stable organizational environment.

c) Technology Trends (46 responses): Responses in this category centered on the emergence of potential new technologies, and on challenges relating to changes in existing technologies. 20 responses cited electronic records systems either already in place, or planned for future implementation. 10 responses noted impacts from system migrations and/or changes in existing systems. The internet was cited by 5 responses for its impact on cost effectively meeting training needs, as well as its use in allowing for self

[19] Record Copy is defined in OAR 166-005-0010 (7) as "the official copy of a public record when multiple copies exist."

care, and in data exchange. Additional responses noted how technology is impacting recruitment, and how legal requirements such as HIPAA are driving technical change.

d) Legislative/Legal Issues (45 responses): The two most cited impacts in this category related to HIPAA and State regulations. Also cited were repeated changes occurring in human resource related regulations regarding collective bargaining, workers compensation, retirement, EEOC, benefits, and payroll. Access issues relating to privacy, confidentiality, and the Children's Internet Protection Act (CIPA) were mentioned. The instability of state funding was noted, as well as the difficulty of matching program tools to legislative and legal intent.

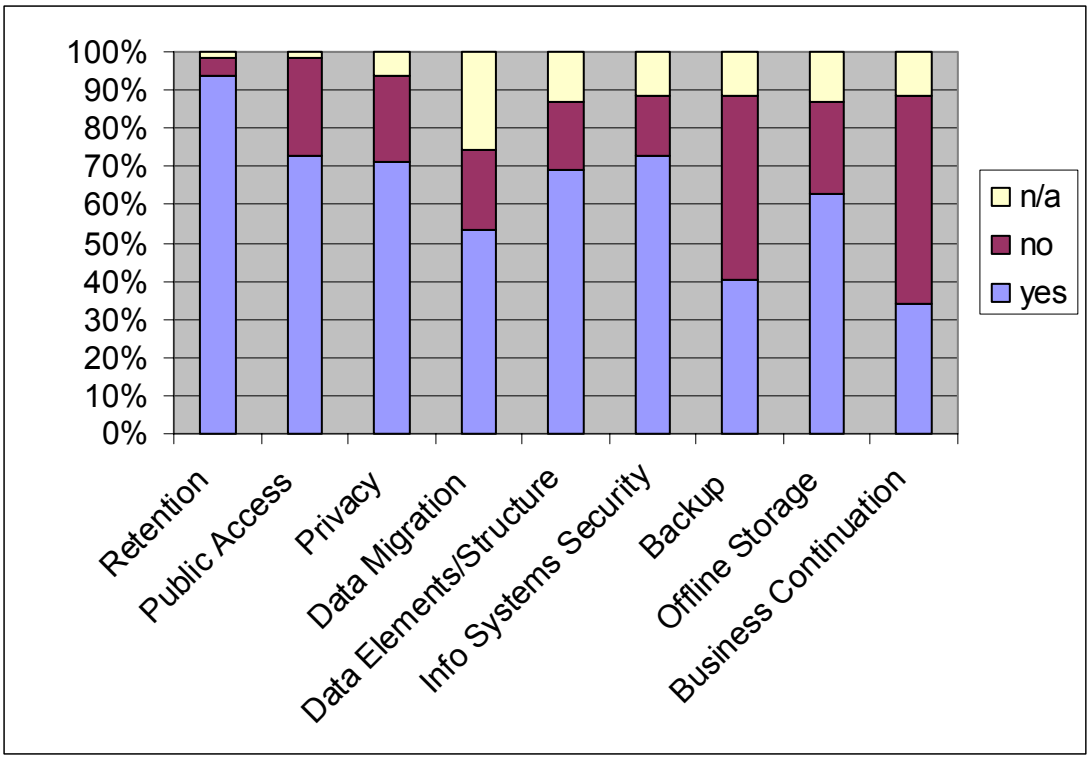
e) Social Trends (45 responses): The most cited social trend having an impact on programs was the increasingly multicultural and multilingual makeup of client populations, with 23 responses. 9 responses centered on the changing nature of the workforce, including the aging of the workforce. Distrust of government was cited, as were the ramifications of such legislation as the Patriot Act.

f) Economic Trends (31 responses): Most cited here was the increase in service demands resulting from a poor economy, while funding remains the same or decreases. The impact on budgets was again cited, as well as the impact on demographics, population movements, and human resources.

The above environmental factors can be summarized simply by one phrase: change. Changes in the resources available to meet increasing program demands; changes in the programs themselves and how they relate to the larger organization; changes in the rules under which programs operate; changes in both the employees and the populations those employees are serving; changes in the information needs of internal and external customers; and changes in the technologies utilized to meet those needs.

From a records keeping standpoint, these changes represent both opportunities and challenges. When information is current and active, quality electronic systems offer unparalleled opportunities to respond to change with a rapidity and flexibility that more traditional systems can not begin to match. It is records keeping which provides the continuity within such structures to meet evidentiary and legal requirements, as well as corporate memory. Yet it is that very change environment which presents longer term challenges in maintaining records authenticity and integrity. This, again, underlines the need for a records keeping policy framework that acknowledges and begins addressing these issues.

3. Formalized Procedures: Finally, the committee was asked to provide program level information on the existence of formalized information procedures. The following summarizes the results of that survey:



With the exception of retention, information management practices are formalized at varying levels. Access, privacy, security, and data element structure are reasonably well-documented, while migration, backup, offline storage, and business continuation are not. This corresponds with recent survey data compiled by the county HIPAA security officer that indicates that there is a low level of formal procedures for county information practices. Note also that procedures are better documented for immediate needs, less well documented for long term needs. While formal procedures are not necessary for all information systems, they often enhance the reliability and authenticity of records keeping systems. This is particularly true of records requiring longer term retentions. OAR 166-017-0020 indicates the kind of system documentation needed for digital imaging systems if the records being maintained on the system have a retention of ten years or more.

Appendix 3
Overview of Technologies

The following summarizes many of the principle non-paper technologies currently in use. Each item summarizes briefly the pros and cons of these technologies from a records keeping standpoint.

1. Digital Imaging.

Pros

• Allows broad and rapid access to records
• Can improve workflow and distribution
• Incorporates received documents in electronic systems

Cons

• Image capture and indexing may be expensive
• Can merely automate existing problem recordkeeping
• Long term storage and migration needs may be expensive

Digital imaging systems are computer-based systems that store digitally encoded document images, usually captured via scanning, but sometimes by saving an image of an electronic document. Metadata is attached to each image, documenting a variety of attributes about the image. These systems provide image retrieval and distribution on demand. They are often used as an alternative to paper or microfilm record systems.

The adoption of a digital imaging system requires workflow reassessment and the documentation of information management procedures. Digital imaging systems increase accessibility and distribution of information in a timely manner. Application software will allow accurate tracking of information for audit purposes. Maximum benefits are realized when existing workflow procedures are analyzed and adapted to take advantage of the new technology, rather than just automating existing processes.

Digital imaging systems cannot solve access problems stemming from inefficient or poorly-planned existing information management systems and practices. In fact, they may exacerbate existing deficiencies. They are also poor storage reduction strategies. Digital image capture (scanning) on a large scale can be expensive, ranging from $0.10/image to as much as $5.00/image. The level of indexing, document preparation required, and the consistency of the original documents (color, print quality, paper thickness, etc.) can impact the cost of conversion. These systems often are most cost effective when used to capture and manage standardized forms received from external parties. They are less cost effective with documents that are highly mixed in format, due to the difficulty of image capture.

Kodak has a pretty useful digital imaging online training site at:

http://www.kodak.com/US/en/digital/dlc/book3/chapter1/index.shtml

2. Data Warehousing.

Pros

• Allows users to combine data and analyze it based on their own particular needs
• Minimizes the need to reformat data
• Data analysis does not impact operational systems

Cons

• Better as an information system than a recordkeeping system
• Requires high level of data and metadata maintenance

A data warehouse is a collection of data gathered and organized so that it can easily be analyzed, extracted, synthesized, and otherwise used for the purposes of further understanding the data. Information from spreadsheets, databases, accounting systems, inventory management systems, call centers and any other operational system that is used in recording the day to day transactions of an enterprise are copied to a central location and relationships between the different data feeds are established. This information once checked is given added value by summarizing it according to a set of business rules and with reference to the metadata (data about data). The summarized information is then made available to the end user by the most appropriate delivery mechanism.

Data warehouses are used to separate analysis and reporting activities from records keeping activities. The warehouse allows users to analyze data without slowing or impacting the integrity of operational systems. It also allows users to view the same data in different arrangements and levels of detail. The use of business rules and standardized metadata allow the exchange of data between organizations and allows users front-ends to access the information easily.

Data warehouses do not store records, but copies of records and other non-record data. While useful as an analysis and reporting tool, they do not maintain complete, reliable, authentic *records* and as such are poor choices for records keeping systems. They also require fairly high levels of data and metadata maintenance in order to provide reliable data for analysis.

Although the following listings have been put together by a reporting software vendor, their analysis of what a data warehouse can and can't do is pretty useful:

http://www.ids.co.za/common/benefits.htm
http://www.ids.co.za/common/NotWarehouse.htm

3. Electronic Records Management System (ERMS).

Pros

• Standardized (DOD 5015.2) system
• Allows mixed environment (paper and electronic) to be managed together
• Can provide accurate classification and retention guidance

Cons

• Often requires users to apply complicated classification schemes
• System may be overly complex for many programs
• May be more expensive than many records environments warrant

Software used by an organization to manage its records. An ERMS primary management function is categorizing and locating records and identifying records that are due for disposition. It also stores, retrieves, and disposes of the electronic records that are stored in its repository.

An electronic document management system (EDMS) facilitates access to online documents ,and may provide some method of integrating documents into the workflow. It is essential for an organization to manage its records, both paper and electronic. A document management system will not do this on its own.

An electronic records management system allows users to manage records online and in paper format. It controls who has access to records, where they are stored, and how long they are kept. It also makes it easier to search for records. Put simply, it automates the whole records management process. The US standard for ERMS's is DOD 5015.2:

http://www.dtic.mil/whs/directives/corres/pdf/50152std_061902/p50152s.pdf

Electronic records management systems can be intrusive. Often, users are asked to provide complex classification information necessary to file documents. Efforts to do this at the desktop have had limited success due to this intrusiveness, particularly if the classification scheme is complex. The result may be shadow paper or electronic systems which defeat the purpose of the software. One solution is to have documents routed to staff dedicated to categorization and filing. In addition, automatic classification systems are available in which the software actually performs the filing based on document contents. While their level of accuracy is sufficient in some environments, in others the accuracy of such systems is insufficient to meet business needs or legal requirements.

4. Content Management Systems (CMS).

Pros

• Allows for effective presentation of digital content on the web
• Allows multiple uses of the same content
• Does not require users to have technical expertise to publish to the web

Cons

• Requires significant up front planning and structure to make the system work
• Presentation only system; does not manage content or content metadata

Software that enables one to add and/or manipulate content on a Web site. Typically, a CMS consists of two elements: the content management application (CMA) and the content delivery application (CDA). The CMA allows the content manager or author, who may not know HTML, to manage the creation, modification, and removal of content from a Web site without needing the expertise of a Webmaster. The CDA uses and compiles that information to update the Web site. Content is usually stored in some sort of database. The features of a CMS system vary, but most include Web-based publishing, format management, revision control, and indexing, search, and retrieval.

Content Management Systems (CMS) are increasingly popular because they hold the promise of allowing organizations to manage Web content with a high-level of efficiency. They enable non-technical (authorized) employees to easily publish content to a Web site. Plus they allow organizations to reuse and repurpose content so the same content can appear in multiple locations as needed. This streamlines the content development process.

A CMS driven site is only as good as the people who design it. A flawed architectural structure or lack of attention to detail about content creation will cause a project to fail. Many, many organizations report frustration with results due to the fact that they do not pay attention to details in the planning phase. The following article on CyberAtlas describes this further:

http://cyberatlas.internet.com/big_picture/applications/article/0,,1301_1718951,00.html

5. Electronic Document Management Systems (EDMS).

Pros

• Provides broad access to electronic documents
• Maintains version control and tracks individual document attributes

Cons

• Usually do not have retention components
• May require complicated classification schemes

The primary function of an EDMS is to manage electronic documents within an organization's workflow. EDMS are particularly good at assisting a group of people to jointly author a document as EDMS document the drafting process and collect information about which version is current. EDMS also control access to documents, allowing only those authorized people to view or edit documents and they often keep an audit log of access. Thus EDMS do fulfill some of the requirements for electronic records keeping. But, while EDMS do usually allow some categorization of documents, they are not usually very good at relating records to other records. Records can be made up of multiple documents. EDMS usually only deal with documents as single entities and so it is not always possible to construct full records containing multiple documents.

EDMS do not solve the problem of technological obsolescence. Documents stored in EDMS are usually in their native formats, which may not be readable for the time which a record is required. EDMS themselves may not last more than 5-10 years, while records may need to survive for hundreds of years.

6. Databases.

Pros

• Often a simple and inexpensive method for managing information
• When properly structured can provide authentic and reliable records
• Flexible way to control access and sharing of data and records

Cons

• Often user-constructed without proper metadata or data structures
• Difficult to apply records retentions to databases
• Software dependencies can lead to migration problems

A shared collection of logically related data, designed to meet the information needs of multiple users in an organization. The term database is often erroneously referred to as a synonym for a "database management system (DBMS)". They are not equivalent. A database is a store of data that describe entities and the relationships between the entities. A database management system is the software mechanism for managing that data. Databases and DBMS's are some of the most common electronic data systems in organizations today.

A DBMS's main purpose is to organize data so that it can be retrieved and manipulated by an application or a user. A good Database Management System (DBMS) provides the following functionality:

- Data Definition -- A DBMS must define a structure for stored data, and provide a means for a user to define and organize their own data within that structure.
- Data Retrieval -- A DBMS must provide a toolset that allows a user to retrieve data stored in the database. This toolset can take many forms, such as programming APIs and simple query tools.
- Data Manipulation -– Database users must be able to add new data, change existing data, or delete existing data.
- Access Control -- The database administrator should be able to define data access by individual or group. A single DBMS can manage data that can be seen or manipulated by only one individual while also providing other data that can be viewed by the entire user community. It should detect and prevent any unauthorized access.
- Data Sharing -- More than one user should be able to use the database at the same time without fear of overwriting each other's data changes.
- Data integrity -- A DBMS should provide mechanisms for maintaining data integrity through system failures and inconsistent, or incomplete, updates.

Although it is written for and geared to librarians, the following site offers a pretty good overview of the types of DBMS's in existence today:

http://www.biblio-tech.com/html/databases.html

7. Office programs.

Pros

• Easy to use and familiar to most users
• Do not require complex or expensive management systems
• Current versions often allow inclusion of metadata in the document

Cons

• Software obsolescence can lead to unreadable documents
• Little standardization of document metadata
• Difficult to contextualize individual records

Many agencies regularly use office programs to generate documents, spreadsheets, project plans and presentations. Many of these documents are corporate records of the agency. The use of department networks allows many different people to access these records and office programs do not regulate that access. Unless documents are especially protected by the creator or user, they can be altered and so lose their value as evidence.

Records cannot provide accurate corporate memory unless they are categorized and

grouped with other related records. In order to understand the "full story" about a particular transaction or event, it may be necessary to read many related records. Office programs are not very good at categorizing or relating records.

8. Email systems.

Pros

• Easy way to communicate information and records
• Fairly standardized data structures in place
• Simple to use

Cons

• Difficult to share stores of email
• Systems often do not have good mechanisms for storage and retrieval of messages

Email systems are software systems which transport messages from one computer user to another. Email systems create electronic records but do not manage them very well. Emails which form part of the corporate record should be able to be read by anyone who has sufficient access privileges. But many email systems only allow the recipient or the creator of emails to access those messages. Records should not be able to be altered (or only in an authorized fashion), otherwise they may not be considered reliable evidence. Many email systems, including the county's, allow users to alter their message after they have been sent or received, and do not provide many records keeping features.

9. **Microfilm**.

Pros

• Excellent medium for long-term storage of records
• Inexpensive to duplicate and store
• Established, standardized technology

Cons

• Difficult to use and share
• Image capture is expensive
• Often requires extensive indexing and is not searchable
• Increasing obsolescence makes equipment hard to maintain

Microfilm captures images photographically from hard copy and electronic sources. Microfilm's chief advantage is its longevity – properly prepared and stored microfilm has a life expectancy of 500 years, making it one of the most durable of information media.

Because of this, microfilm is increasingly being used as a backup for electronic records keeping systems which maintain long retention records in hybrid electronic/microfilm systems. Microfilm can also be scanned into an imaging system.

Microfilm is less useful as an active records technology, due to difficulty in usage. While image capture is less expensive than with electronic imaging systems (due to the less onerous indexing requirements and faster image capture technology), documents still need to be prepared and filmed in a labor intensive process. In addition, use of the technology is being replaced by electronic systems, making readers and other support equipment more expensive and difficult to maintain.

A brief history of microfilm, with references is available at:
http://www.heritagequest.com/html/lhgl_001228.html#history

Appendix 4
Glossary of Terms

Archives. Archives are public records that are maintained permanently because they have enduring value in documenting rights or obligations of public agencies and citizens and/or have long term research value. In Oregon, county archives are records which are dated 1920 or earlier, are listed on the Oregon Historic Records Inventory, or have a retention of "permanent" on a county records retention schedule.

Business needs. An agency's need to conduct its business, maintain a record of its essential activities and decisions for its own use, support oversight and audit of those activities, and permit appropriate public access.

Custodian. The custodian of a record is the county employee who keeps the public record on file as part of their job. Under the Public Records Law, custodians are responsible for making records available for inspection and copying and with preserving records for their mandated retention period.

Digital Divide. The term 'digital divide' describes the fact that the world can be divided into people who do and people who don't have access to - and the capability to use - modern information technology, such as the telephone, television, or the Internet.

Electronic information system. A system that contains and provides access to computerized Federal records and other information. An information system is a data processing system that engages in collecting, processing, editing, storing, transmitting and supplying data relating to a certain area of application. The term information system is normally used in a narrower sense to refer to an automated system. It then refers to the applications in combination with the technology infrastructure. In a wider sense the information system includes all the procedures and resources in connection with the data of a certain area of application. A non-automated administrative system is therefore an information system, too.

Electronic recordkeeping system. An electronic system in which records are collected, organized, and categorized to facilitate their preservation, retrieval, use, and disposition. An electronic recordkeeping system may be either a distinct system designed specifically to provide recordkeeping functionality or part of another system. A distinct electronic recordkeeping system will comprise an application program which provides recordkeeping functionality, data and metadata needed for management of the records controlled by the system, and any electronic records managed by the system. An electronic recordkeeping system may be part of another system, such as an application system or an electronic document management system, when the design of that system includes recordkeeping functionality.

Electronic source record. An electronic record created using office automation software from which the recordkeeping copy is derived. The designation, "electronic source record," does not define a distinct class of records. Rather it specifies the role of a record in the total process by which an agency meets its obligation to create and retain adequate and proper documentation as. In the paper environment, once records are made or received, they are managed by placing them in organized files. In the electronic environment, records may be captured by copying them to an electronic recordkeeping system or printing them on paper and placing the printed copy in paper files. In either case, the electronic record used to produce the recordkeeping copy – i.e., the source of the recordkeeping copy – remains in storage.

Electronic Records. Electronic records are records which are stored in a form that requires a computer to process.

Format: The pattern into which data are systematically arranged for use on a computer. A file format is the specific design of how information is organized in the file.

Information Technology. Any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information, including computers, ancillary equipment, software, firmware and similar procedures, services (including support services), and related resources.

Media: Short for storage media: physical objects on which data can be stored, such as hard disks, CD-ROMs, floppy disks, and tape.

Metadata. The simplest useful definition of metadata is "structured data about data." This very general definition includes an almost limitless spectrum of possibilities ranging from human-generated textual description of a resource to machine-generated data that may be useful only to software applications.

Public record. The statutory definition found in ORS 192.005 is:

> "Public record" includes, but is not limited to, a document, book, paper, photograph, file, sound recording or machine readable electronic record, regardless of physical form or characteristics, made, received, filed or recorded in pursuance of law or in connection with the transaction of public business, whether or not confidential or restricted in use.

Record Copy. Record copy means the official copy of a public record when multiple copies exist.

Record protection. The aggregate of all processes and procedures established and designed to inhibit unauthorized access, contamination or elimination.

Recordkeeping. Making and maintaining complete, authentic, and reliable evidence of business transactions in the form of recorded information. A *complete* record is one that includes all of the elements required by common or legal description. An *authentic* record

is one that is and can be proven or accepted to be what its owner says it is. A *reliable* record is one that can be trusted as an accurate representation of the transactions, activities, or facts to which it attests and can be depended upon in the course of later transactions or activities.

Retention Schedule. A document that describes types of records and the period of time, or retention period, each type must be kept before it's destroyed. Retention periods are identified through an analysis of the legal, fiscal, operational, and historic values of the record.

Sustainability. Sustainability is defined as using, developing, and protecting resources at a rate that enables people to meet their current needs while providing for the needs of future generations.

Appendix 5
Annotated Bibliography

Reports

1. Trusted Digital Repositories: Attributes and Responsibilities, Research Libraries Group, May 2002. A trusted digital repository is one whose mission is to provide reliable, long-term access to managed digital resources to its designated community, now and in the future. This report uses the OAIS metadata model to frame its case for the long term management and preservation of electronic records.

2. Challenges in Managing and Preserving Electronic Record, General Accounting Office, June 2002. This report outlines the state of electronic records management in the federal government and an analysis of the National Archives' response.

3. Authenticity in a Digital Environment, Council on Library and Information Resources, May 2000. This report includes the presentation of five papers by content area experts on the theme of authenticity and a discussion of their themes. *Highly recommended*.

4. Electronic Records and the Law: Causing the Federal Records Program to Implode, PhD Dissertation of Mary Rawlings-Milton, April 2000. This document includes great overviews of the major theoretical approaches to electronic records management.

5. Learning about Information Technologies and Social Change: The Contribution of Social Informatics, Rob Kling, 2000. This article provides an overview of social informatics. In much the same way as the book The Social Life of Information (reviewed here) it attempts to understand the roles information and technology play in organizational social settings.

6. Risk Management of Digital Information: A File Format Investigation, Council on Library and Information Resources, June 2000. This report investigates the application of risk management processes to the management of electronic records.

7. Social Implications of the Internet, Paul DiMaggio et al, 2001. Article contains an analysis of the internet particularly, but discussion could also apply to networked electronic records as well.

Standards

1. DoD 5015.2-STD, Design Criteria Standard for Electronic Records Management Software Applications, Department of Defense, June 2002. Originally designed only for

Department of Defense applications, this standard is widely used by government and private entities to certify records management applications.

2. Published by ISO (International Organization for Standardization), ISO 15489 (2002), *Information and documentation - Records management* focuses on the business principles behind records management and how organizations can establish a framework to enable a comprehensive records management program. The link above is to the press release for the final, for-purchase-only, standard.

Projects

1. The Victorian Electronic Records Strategy is a respected project by the Victorian (Australia) government "which is centered around the goal of reliably and authentically archiving electronic records created or managed by the Victorian government."

2. The InterPARES project (also known as the UBC or University of British Columbia project) has been seminal in developing theory and methodology for the preservation of authentic electronic archives. It has just received funding to expand its research to the reliability and accuracy of non-permanent records.

3. Oh, the irony! Reviewing the Functional Requirements for Evidence in Recordkeeping project (also known as the Pittsburgh Project) can only be done via Brewster Kahle's Internet Archive. The note from Dr. Cox illuminates problems and solutions regarding electronic documents.

4. The Delaware State Archives created model guidelines for electronic recordkeeping based on a limited version of the Pittsburgh Project's functional requirements. It is informative to see how the theory has been put into actual practice.

5. In 2000, the National Archives and Records Administration (NARA) began a project to analyze and redesign the recordkeeping practices of federal agencies. The project website has several reports, of which the proposal and strategic plan are the most informative.

6. The Electronic Records Archives (ERA) is NARA's strategic response to the challenge of preserving, managing, and providing access to electronic records. ERA will authentically preserve and provide access to any kind of electronic record, free from dependency on any specific hardware or software, enabling NARA to carry out its mission in the future.

Reference

1. First Monday is a great place for articles on electronic systems, recordkeeping, archival science, and many other things not directly related to electronic recordkeeping. Indexed by article title and by author.

2. How Much Information is the Berkley School of Information Management and Systems attempt to categorize both the type and growth rate of a variety of information formats. Informative and fun!

3. The Trustworthy Information Systems Handbook was produced by the Minnesota State Archives to assist agencies in assessing the status of their electronic systems and some tips for making the records they produce more trustworthy.

4. Every two years, following adjournment of regular legislative sessions, the Attorney General updates and publishes a Public Records and Meetings Manual. The manual is intended to provide assistance to state agencies, local governments and to the public generally.