

Washington State

Digital Archives Project Investment Plan

August 2003

Washington State Digital Archives Investment Plan

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SECTION I:

**INVESTMENT APPROVAL
REQUEST FORM**

Investment Approval Request

This space For DIS/MOSTD use only:

Investment Approval Request
For Information Technology Resources

Department of Information Services
Management & Oversight of
Strategic Technologies Division

360/902-2975
MS: 42445

1	Agency: <u>Office of the Secretary of State</u> Contact: <u>Cathy Turk</u> cturk@secstate.wa.gov	Division: <u>Archives and Records Management</u> Phone No. and E-Mail: <u>(360) 586-1116</u>
2	Description of Resources: SAN and network hardware and infrastructure. Content management software. Personal services for external Quality Assurance, and training. Purchased services for file and software conversion.	Resource to be Acquired Type of Resource: <input type="checkbox"/> Equipment <input type="checkbox"/> Software <input type="checkbox"/> Purchased Services <input type="checkbox"/> Personal Services Telecommunications: <input type="checkbox"/> Voice <input type="checkbox"/> Data <input type="checkbox"/> Video
3	Acquisition Method(s): Check All That Apply	<input type="checkbox"/> Request for Quotation (RFQ) <input type="checkbox"/> Request for Quotation and Qualification <input type="checkbox"/> Private Sector Strategic Partnership <input type="checkbox"/> Sole Source <input type="checkbox"/> Request for Proposal <input type="checkbox"/> Master Contract <input type="checkbox"/> Inter-Agency Transfer <input type="checkbox"/> Interlocal Coop. Purchasing Agency # _____ Contract # _____
4	Investment Cost (see definitions on back):	\$ <u>2,577,568</u>
	System Life Cycle Cost (see definitions on back):	\$ <u>7,591,662</u>
5	Agency Approval (Signature):	Date:
6	ISB/DIS Approval (Signature):	Date:
7	(FOR DIS USE ONLY) Comments:	

SECTION II: EXECUTIVE SUMMARY

Executive Summary

Purpose

The Office of the Secretary of State, Division of Archives and Records Management, is mandated by statute to insure the proper management and safeguarding of public records and facilitating citizen and government access to those records. This mandate encompasses a wide range of responsibilities including centralizing the archives of the state of Washington, developing retention schedules and ensuring the maintenance and security of all state public records regardless of format.

Technology and the “electronic revolution” are having a substantial impact on the way governments conduct business and present challenges for capturing, preserving, managing, storing and making accessible electronic records. Significant amounts of critical electronic data have already been lost. The primary purpose of the Digital Archives is to preserve and provide access to records of enduring legal and historical significance. As government records are increasingly generated and stored in computer-based information systems, the state faces the challenge of managing and preserving these digital documents. Many are critical to the survival of Washington’s history and culture, captured in the day-to-day business of government.

Project History

The agency began strategic planning for the Digital Archives in March of 2000, when the project first appeared in the agency’s Information Technology Portfolio. Planning for the physical design and technical infrastructure of the facility occurred between December 2001 and July 2002. Site visits by project team members were made to the National Archives and the Library of Congress. A strategic plan was developed that included extensive involvement of staff, executive management and external stakeholders. In March 2003, GlassHouse Technologies, Inc., a vendor-neutral technology firm with specific expertise in mass storage architecture, was hired to assist the agency with assessing the technical feasibility and proof-of-concept testing, determining system requirements, designing the system architecture and working with the agency to develop cost estimates. That work was completed in June 2003.

The physical “hub” for the Digital Archives will be the new facility currently being constructed in Cheney, Washington. Construction is scheduled for completion in spring 2004. This two-story facility will house both the Eastern Washington Regional Archives (traditional paper archives) as well as the Digital Archives serving both state and local government agencies.

The Technology

The Digital Archives will require a mass storage environment that can provide ease of scalability as the demand on the Digital Archives grows, rapid access to the information to serve the customer needs, and a stable, redundant environment to ensure maximum “up time” of the system. The system architecture will be comprised of:

- LAN Server Platforms
- Network switches and on-line disk storage
- Near-line tape drives, tape library and associated backup software
- Index and file database to store electronic archival records

Web servers will deliver electronic archival records to customers, providing remote access. A content management system will provide intelligent, context-based searching capability of metadata and file attributes.

The project will employ technologies that will not require large initial investments by client agencies and will be designed to work in the background in an automated manner without manual intervention on the part of client agencies. Off-the-shelf technology and applications will be utilized, with limited customization. Models exist that incorporate SAN technology for very large scale data archiving, web spidering and e-mail archiving. Management and records search capability will be provided by a proven content management solution. A combination of service bureaus and in-house solutions will be utilized for legacy hardware and software conversion.

Project Implementation

The Digital Archives project is planned in four staged phases, each phase building on the knowledge and experience of the previous one, while increasing the robustness and capacity of the system architecture over time:

- **Phase I:** Initial rollout of the SAN architecture and content management system at the Digital Archives. One records series at the local government level will be identified and accessioned into the Digital Archives from all 39 counties. Additionally, the Office of the Secretary of State will serve as the pilot agency to test the remote accession capability of the content management system.
- **Phase II:** Four to six state and local government agencies of varying technological abilities and presence will enter into a Memo of Understanding with the Digital Archives. By working with these partner agencies, the Digital Archives will test the various technologies and accession methods (content management, FTP, manual entry). Technical assistance and training for these initial partner agencies will be provided.
- **Phase III:** Additional state agencies will be targeted which generate records of known archival value (such as the Governor's Office, Legislature, etc.). Again, agencies will be asked to enter into a Memo of Understanding with the Digital Archives; technical assistance and training for these agencies will be provided.
- **Phase IV:** All other remaining state and local government agencies will be able to sign a Memo of Understanding with the Digital Archives and begin transmitting data. This phase will also continue to focus on capturing and archiving email from policy makers in all the major agencies at the state level.

Financing Plan

The technology investment, as well as the ongoing operating costs for the Digital Archives, will generally be funded through a combination of two revenue sources:

- Revolving fund charges to state agencies (40%)
- Local revenue generated through a one dollar surcharge on documents recorded at county auditor offices (60%)

The initial technology investment is estimated at \$2.4 million, to be financed through a four-year Certificate of Participation. Ongoing upgrades, maintenance and replacement of the required technology will be part of the project's ongoing operating costs.

Projected local revenue collections are anticipated to be adequate for both initial start up and the ongoing costs at the 60% level. State revolving fund charges will need to be increased to meet both current and ongoing needs at the 40% level.

This Washington State Digital Archives Investment Plan includes cost projections through FY2011, five years following the initial development during 2003-2006. Cost estimates are assumed to be highly accurate for the development phase.

The facility that is currently being constructed in Cheney, Washington is funded through a Certificate of Participation on a 15-year term. Payments on the COP are included in the agency's existing operating budget and are also made using the combined funding sources.

Ensuring Success

The Office of the Secretary of State, in seeking approval for the Digital Archives project, agrees to abide by the principles of *Responsibilities and Obligations for Quality Assurance* as adopted by the state. A Quality Assurance Plan is also required for this project. Several strategies have, and will continue to be, employed to ensure project success. These include, but are not limited to:

- Strong executive sponsorship and involvement
- Use of an external Quality Assurance contractor
- Expert outside consulting services with industry expertise, as needed
- Regular weekly meetings of the project team to establish milestones, review progress, and deadlines
- Phased implementation, incrementally developing and expanding the system rather than trying to implement the entire system all at once
- Hiring new staff with required skill levels
- Targeted training for agency staff to increase knowledge and skill levels
- Use of competitive procurement processes, where identified, to obtain the required functionality at competitive prices
- Careful contract negotiation and development to ensure that requirements are met
- Continued involvement by the agency's Department of Information Services OITO liaison and conformity with state policies and standards
- Revision to the Washington Administrative Code (WAC) addressing the archiving of electronic records using a process that involves all key stakeholder groups

SECTION III:

**PURPOSE OF THE PLANNED
INVESTMENT**

Washington State Digital Archives Investment Plan

III.a. Business Objectives

The Office of the Secretary of State, Division of Archives and Records Management, is mandated by statute to insure the proper management and safeguarding of public records and facilitating citizen and government accessibility (RCW 40.14.020). This mandate encompasses a wide range of responsibilities including centralizing the archives of the state of Washington, developing retention schedules and insuring the maintenance and security of all state public records regardless of format.

In June 2001, the Office of the Secretary of State completed a strategic planning process culminating in the agency's published 2001-2007 Strategic Plan. That plan recognizes the need to establish a digital archives program for storage of electronic records in order to prevent losses to the state's documentary heritage.

Retention of electronic records has reached crisis proportions. Some public records are only maintained in an electronic format. In an attempt to comply with general obligations regarding digital records, many agencies are either retaining almost every electronic file or they are deleting records from servers without sorting short from long term items. The collective record of state and local government is at risk of significant loss.

Technology is one solution to improving government business processes. Government agencies are applying new technologies to conduct an increasing amount of their business electronically over networks. Older records captured through proprietary systems or on platforms no longer supported, the rapid evolution of technology solutions both hardware and software, and the volume of electronic data that is increasing exponentially are some of the challenges facing government agencies.

The technological challenges are having a substantial impact on agencies ability to create, manage, and use electronic records to support their legal responsibilities and business needs.

The specific objectives for the Digital Archives are solutions that provide:

- Simple, reliable, persistent methods to capture, identify, index, store and retrieve digital records for their statutory retention periods or permanently in the case of archival material.
- Cost-effective means to retain and maintain, through migration processes, the readability and accessibility of the historical record of government in the state.
- Public access to the collection(s) so that citizens, including students, have the ability to search and retrieve electronic information and historical objects such as photos and maps to explain the role in government in Washington State, optimally via remote access.

III.b. Project History

Records are specific pieces of information produced or received in the creation, conduct or completion of an institutional or individual activity and set aside as evidence of that activity. The use of electronic information technologies is transforming the conduct of government business. The down side of this electronic revolution is the staggering accumulation of electronic and paper records that chronicle government decisions and actions.

In March of 2000 a strategy was developed by the Secretary of State's Division of Archives and Records Management, to deal with the identification of technology, policy, and management factors that would ensure that electronic records are created, maintained, and stored in a manner that facilitates access for agency operations, secondary uses, evidentiary needs, and archival purposes. That strategy included a vision of a central repository and its incorporation into the Eastern Regional Archives facility currently being constructed in Cheney, Washington.

The facility construction project was included in the 2001-2011 Capital plan and the passage of HB 1926 created a surcharge of \$1-per-page, collected by county auditors on recorded documents, to help pay for the facility and on-going operations (see Financing Plan, Section V.f.).

The agency conducted strategic planning sessions to address the myriad of issues involved with electronic records created in over 3,000 local and state government agencies with varying retention requirements.

Trips to the National Archives, in College Park, Maryland and the Library of Congress in Washington, DC in May of 2002 were undertaken by Digital Archives project team members. Valuable information was gathered and a strategic plan was developed that included extensive involvement of staff, executive management and external consulting to begin the process of creating the first digital archives incorporating state and local government records.

Planning the physical design and technical infrastructure of the facility occurred during CY 2000. The services of Sparling, a technology consulting firm, were employed to help design the technology specific spaces. Early site work for the facility began July 2002, and construction began January 2003.

III.c. Challenges in Managing and Preserving Electronic Records

Electronic records, unlike paper records, are susceptible to undetectable changes in content and format unless they are held securely and under defined and auditable procedures. This is essential if all electronic records are to be acceptable as evidence in legal proceedings. These procedures must ensure that electronic records are an authentic and accurate representation of the transaction and have been kept safe from alteration.

The fragile nature of the electronic medium, and the dynamic way in which information technology is deployed, threaten the reliability and authenticity of the record if appropriate information management disciplines are not applied.

Perhaps the greatest challenge to electronic record keeping is the evolution of technology itself. New hardware and software are replacing the products and methods used to record, store and retrieve digital information on cycles of 2 to 5 years. No system is currently capable of more than 30 years of retention and access.

Content migration presents its own set of challenges to preserve the integrity of the original electronic record. Migration includes refreshing as a means of digital preservation. However, it is not always possible to make an exact digital copy or replica of a database or other information object (due to hardware and software changes) and still maintain the compatibility of the digital data with the new generation of technology. Some content, functionality, or structure may be lost during migration. Dependence on migration as a strategy for long term retention of electronic records is a form of risk management. The organization must weigh the benefits of maintaining a record's full information content against the cost of migration. Many smaller state agencies do not have the financial resources to maintain a file's electronic records, only to discover that they may lose the information eventually. Clearly a more certain and enduring solution is needed.

Finally, in many cases the only metadata for a large and complex record collection exists as a poor fifth-generation paper copy of a printout, or worse only as a set of handwritten notes. The focus of past custodians was often on data preservation rather than record preservation. The result being that we may have all the numbers, but little indication of what those numbers are trying to tell us or why.

One of the primary challenges for the Digital Archives is the sheer number of agencies within state and local government that would be submitting data in a wide variety of formats. Currently, the Archives has retention schedules for over 3,000 state and local government agencies, with over 30,000 divisions of state agencies. Tasks such as managing permissions become more complex when driven by this type of volume. There are no current comprehensive models for

this type of archiving which coordinates numerous agencies and data types. There are, however, models that are applicable for most parts of our required solution. For example, there are implementations of very large-scale data archiving. Models also exist for web spidering and e-mail archiving.

In addition to the technical complexity of managing the electronic data, there is further complexity in addressing the business needs of the stakeholder groups. Electronic data requires a new way of looking at archiving and records retention policies. The volume of electronic data is staggering, and precludes the ability to visually inspect the data first to determine its archival value, as has traditionally been done with paper records. In addition, many agencies want to keep and display their own data because it is a source of revenue resulting in a reluctance to transmit the records to the archives, or to allow the archives to web enable access to the records. These issues will need to be addressed agency by agency, with interagency agreements developed between them and the Division of Archives and Records Management.

SECTION IV:
BUSINESS JUSTIFICATION

IV.a. Conformity with Agency Information Technology Portfolio

Business and IT Goals

The business strategies and goals that this project serves are described in Section III.a. – Business Objectives. This project has been assigned a Rating Level 2 on the Risk/Severity Matrix; however, the legislature required that this project be closely followed and documented in the Agency IT Portfolio.

The Digital Archives will fulfill the following IT strategic initiatives:

- Continuing to provide a consistent means via the Internet for the public to access Washington State historical records.
- Using the state-of-the-art technology and information systems that support advanced computing, enhance customer service, and improve the processes of the Division of Archives and Records Management.
- Being the leader in Digital Archiving – the ability to obtain, index, store, maintain, and retrieve digital archival objects.

Effect on Existing Technology Infrastructure

The Office of the Secretary of State’s Digital Archives project is in full compliance with the Standards and Protocol Directions set forth by the Department of Information Services (DIS), Information Services Board (ISB), implemented on April 10, 2002. (Exhibit A.)

The existing standards, both hardware and software, of the Office of the Secretary of State were considered in the first stages of this project. Hardware will be purchased based on these standards and there is no anticipated impact to the existing IT structures in place.

There are no planned changes to any internal network and desktop support services technologies (including printers, workstations, laptops, peripherals, etc.) as a result of this project. Planned upgrades to existing workstations have been budgeted and do not impact this project’s budget.

The two major impacts will be bandwidth and storage space. Increased traffic via the Internet is expected and is accounted for in the networking plan. The performance of the existing network has been excellent, although it will be essential that technical support staff continue to be trained on the digital storage technology, as well as effective network tools and practices in order to minimize any downtime.

The storage of digital objects does, of course, require a large amount of storage space. Previously, Storage Area Network (SAN) technology was not used in this agency; technical staff have spent the last 18 months on training and gathering knowledge to understand how storage space will increase, and how they will

handle expanding storage needs. Additional storage media are included in the cost estimates and will not negatively impact existing agency storage requirements.

Exhibit A
Washington State Information Technology (IT) Standards & Protocol Directions
Information Service Board (ISB)
 April 10, 2002

Internet Protocol Directions Adoption Date		
Portable data	Extensible Markup Language (XML)	December 1999
Portable logic	Server-side logic (Enterprise perspective of only limited, deliberate placement of code on the desktop)	December 1999
Trust, Security, Non-repudiation	Lowest level of authentication necessary for the application. In those cases where certificates are determined to be necessary, X.509 Version 3 is the standard for the certificate format	December 1999
State Internet Standards		
Accessing online directory services	Lightweight Directory Access Protocol (LDAP)	December 1999
Hyper Text Presentation	Hyper Text Markup Language (HTML) 4.01	April 2002
Internet/Intranet Services	<ul style="list-style-type: none"> • Open Internet routing protocols. OSPF or IS-IS for internal routing and BGP-4 for external routing. • SNMP for network monitoring and management. • Internet multicast support: either DVMRP* or PIM*. • MPEG 1 & 2 based compressed video and audio. • Internet based server infrastructure including Harvest style information caching. • Internet compatible listserv style mailing list facilities. • MBONE* and RSVP* oriented services for packetized multimedia applications. • ITU H.323* LAN interactive video. <p><i>* An asterisk indicates an evolving standard that is recognized as an important technical direction for state network initiatives.</i></p>	May 1996
E-mail	Simple Mail Transport Protocol (SMTP), MIME, RCF-822	September 1992
Internetworking Standards	Transmission Control Protocol/ Internet Protocol (TCP/IP)	September 1992
Description	Standard	
Network Transport Infrastructure	SONET technology underlying core transport functions (OC-48, OC-12, OC-3, STS-1, DS-3, and DS-1 interfaces). Frame Relay technology for secondary transport (DS-1 and under).	May 1996 Revised December 1999
Videoconferencing and Circuit Switched Infrastructure	<ul style="list-style-type: none"> • ITU H.320 and H.261 circuit switched interactive video. • ITU T.120 data collaboration. • ISDN PRI (National ISDN-2) and BRI (National ISDN-1) switched interfaces. • ISDN multirate (H0-384, H11-1536, NxDS0). • BONDING Mode 1 inverse multiplexing. 	May 1996
Video Distribution	<ul style="list-style-type: none"> • MPEG-2 based compressed video and audio. • RS-250C compliant transport. • Video I/O directly compatible with analog component and serial digital component (D1) standards. • Adjustable compression and data rates to vary video quality from S-VHS to serial digital component (D1). • Closed-circuit, on-demand monitoring of all 	May 1996

Washington State Digital Archives Investment Plan

	transported broadcast-quality MPEG video streams from multiple points. <ul style="list-style-type: none"> • Sufficient uplink power and low noise transmission to optimize link budgets for small to medium-sized antennas 	
Host level Computer Operating System	370/390 architecture MVS/CICS	June 2001
Distributed "client/server" operating systems	Windows, Windows NT, OS/2, UNIX POSIX compliance	June 2001
Data Base Systems	ANSI-89 SQL	June 2001
Description	Standard	
Telecommunications wiring for building pathways and state office buildings	Work area- UTP or Fiber Intra-building - Fiber	December 2000

Earlier standards are under review and may be subject to revision by the Board.

IV.b. Alternatives Considered

The Washington State Digital Archives Feasibility Study describes alternatives to the Digital Archives project, including:

1. Pursue a “Business-as-Usual” path
2. Require conversion of electronic files to paper
3. Require state and local governments to archive their own electronic files and make them accessible
4. Acquire an Existing Digital Archiving System
5. Develop Digital Archiving System – Full System Implementation

These alternatives were rejected for reasons described in that document. The selected approach described in Section IV.c. reflects development of a digital archiving system based on the architecture recommended by the consultants, but assumes a slower, phased-in implementation plan.

Initial architecture will begin with minimum requirements for scalable enterprise-level infrastructure expandable as additional agencies are connected to the Digital Archives. Each of the four phases would be designed to build on the knowledge and experience of the previous phase. A cost flow analysis for this alternative is provided in Section V.d. and is the preferred alternative.

IV.c. Selected Alternative and Rationale

The focus of the Digital Archives is to maintain electronic records of legal, historical or fiscal significance for long term accessibility. To that end, the Digital Archives must be able to capture records in a variety of formats and bring them into a centralized repository. In order to make the records as accessible as possible, they must be searchable through a web interface with a consistent presentation. The best method to facilitate the searchability of the records will be to ‘wrap’ all electronic records into an XML format, which converts the records into an international standard for marked-up text, and applying metadata ‘tags’ to the documents. These metadata tags will contain structured information about the source of the data, such as date, author, agency and subject. By searching on the metadata tags, more complex, comprehensive searches can be conducted that will locate related documents that may not have been sent to the archives at the same time.

Each participating agency at the state or local level generating records of archival nature will enter into a Memo of Understanding (MOU) with the Digital Archives. This MOU will detail the responsibilities and deliverables of both the Digital Archives and the partner agency. Once the appropriate paperwork has been completed and an agreement has been reached, a team of experts from the Digital Archives will work with agency representatives to identify those electronic records series that are of long-term, archival value that are to be transferred to the Digital Archives.

Once the Digital Archives is operational, the process for accessioning, or accepting records into the Archives repository, will consist of a three tiered approach to address the various levels of technology that is available within participating target agencies:

At the *top tier* (participating agency has high level of technology capability), a content management software package installed at the partner agency will automatically transfer identified records to the Digital Archives content management database upon creation. The partner agency content management software will also add the appropriate metadata tags to the records and wrap them into an XML format prior to transfer.

The *middle tier* will consist of designated personnel at the partner agency using an off the shelf applet to create a metadata text file containing the required information about a record series. Another applet will be used to convert the records into an XML format. Then both the metadata and the XML records will be FTP’d into a specific folder on the FTP server at the Digital Archives. The Archives staff will then take the FTP’d records, check for accuracy and import them into their content management database.

The *bottom tier* (participating agency has little technology capability) option will entail designated personnel at the partner agency filling out a text form file to capture the appropriate metadata, transferring the text files and records to a CD, tape or diskette and then sending this media to the Digital Archives via USPS, UPS, campus mail, etc. The Archives staff members will then check the transfer for accuracy, convert the records to XML with the appropriate metadata tags and import the records into their content management database.

1. System Architecture

Overview

The Digital Archives will require a mass storage environment that can provide ease of scalability as the demands on the Digital Archives grows, rapid access to the information to serve the customer needs, and a stable, redundant environment to ensure maximum “up time” of the system. As shown in Exhibit B, the network architecture will be comprised of:

- LAN Server Platforms (Either UNIX or Windows).
- Network switches and On-line disk storage.
- Near-line tape drives, tape library and associated backup software.
- Index and file database to store electronic archival records.

As there are several distinctly different technologies available that meet the requirements of the Digital Archives, extensive research in to the various options was conducted. The following summarizes these architecture options and is the foundation of the design and purchasing phases of this project.

LAN Server Platform

UNIX or Windows-based servers are the two viable options. UNIX is typically found in server farm environments where large, enterprise scale operations need to be run. Windows has a larger install base, large support group and a much wider availability of compatible software. As the exact performance metrics (i.e. software overhead, user volumes, etc.) will not fully be understood until implementation, the final server selection should focus on flexibility and scalability (i.e. room for growth) to allow the Digital Archives to quickly accommodate any additional processing requirements without changing the server model/platform. The platform, once selected, will become the “standard” for future purchases to maximize economies such as staff skill-set and vendor maintenance. Finally, technologies such as blade servers and clustering could be considered during the later phases of this project, but are not required at initial implementation.

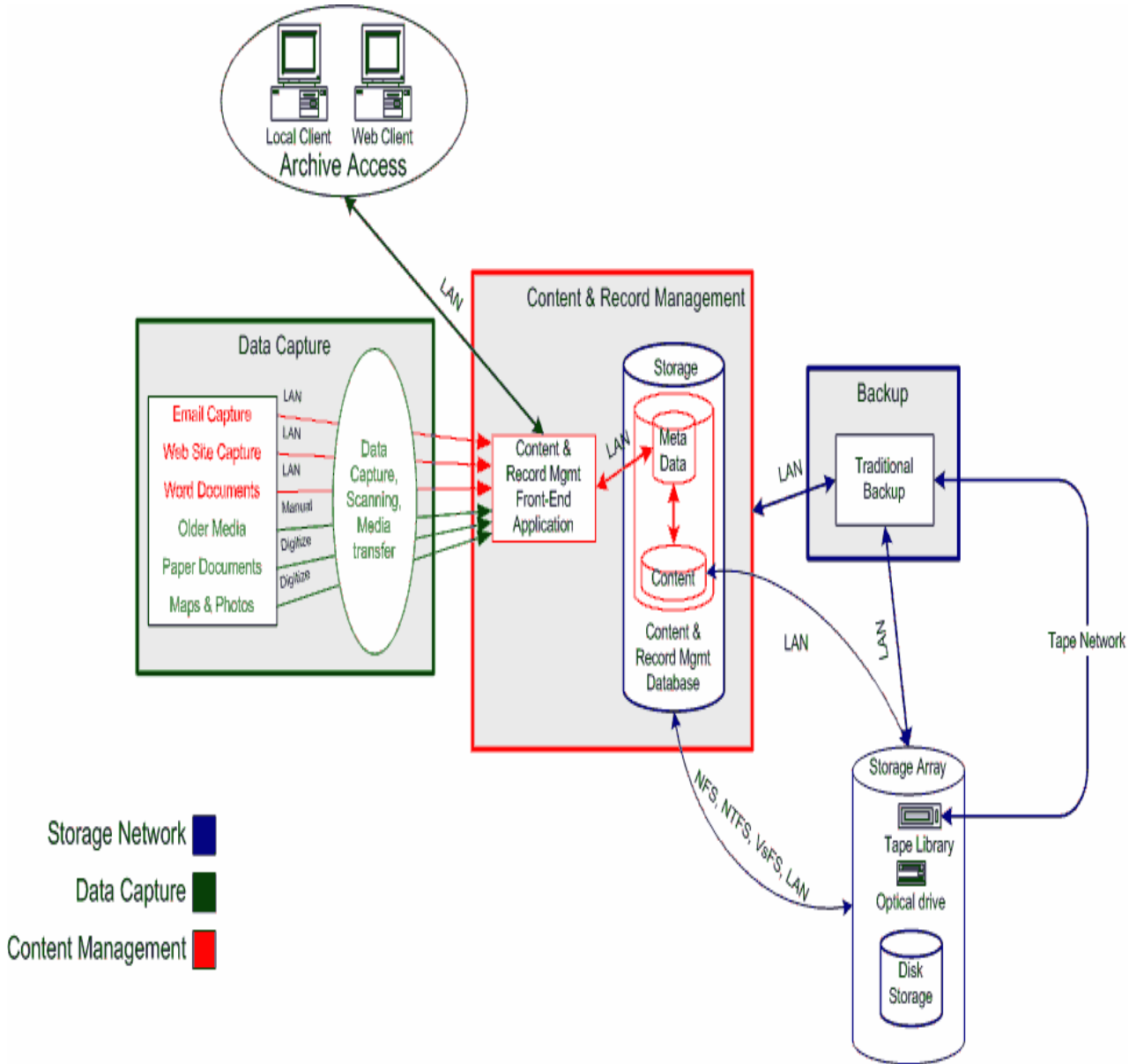
Proposed solution: A windows-based server will be chosen due to the greater variety of compatible products, large user base, and in-house expertise with Windows systems.

Network Switches and Appropriate Storage Network Hardware

- *Storage Network Switched Environment.* There are three identified architectures for mass storage: File Servers, Network Attached Storage and Storage Area Networks. File servers have the storage drives attached directly to a server that controls access and requests to the drives. Of the three solutions, it is the least expensive; but it also has the lowest level of performance, scalability and reliability. Network Attached Storage (NAS)

Exhibit B

Electronic Archiving System Overview



attaches a JBOD (just a bunch of discs) to the LAN. This allows the storage array to be seen by all the servers on the network, but data exchange happens on the same LAN network as the user requests. The addition of the storage traffic to the LAN degrades performance, particularly when backing up data onto tape. Storage Area Networks create a network behind the servers specifically for moving the stored files, either for user requests, tape back up or storage management needs. By containing the storage array to its own network, LAN traffic is not affected, even during large scale tape back ups. While SANs are more expensive initially than file servers or NAS, it maximizes scalability, performance and reliability.

Proposed solution: An enterprise-class storage array connected to a SAN. A RAID-5 implementation offers the most cost-effective data protection schema, and should be implemented on the array. The SAN fabric should be based upon switches with dual-fabric architecture to provide an additional level of redundancy in the environment.

- *Storage Infrastructure.* For external storage connectivity, there are two primary options for the archives infrastructure: Fibre Channel and IP Storage-based protocols such as iSCSI. Fibre Channel protocol has been an open standard since 1991 which has been demonstrating increased performance and flexibility over the past few years as technology develops. IP storage protocols are still new to the marketplace with a limited installed base and at this time is it not known how this new technology will weather the market.

Proposed Solution: The SAN network will use the Fibre Channel Protocol. IP storage may be an option during subsequent phases of this project to facilitate specific additional requirements such as long-distance storage replication over a wide area network, depending on industry adoption of iSCSI or like protocol.

Near-line Storage

- *HSM functionality.* Hierarchical Storage Management is generically defined as a data storage system that automatically moves data between high-cost and low-cost storage media. HSM systems exist because high-speed storage devices, such as storage arrays, are more expensive per byte stored than slower devices, such as magnetic tape drives. Infrequently accessed files can be moved to lower-cost storage as long as the delay in retrieving a file (i.e. when the file is read) is acceptable. Options exist for the type of near-line storage, including but not limited to magnetic media. Optical (DVD) is also an option for near-line HSM storage. The primary benefit of optical near-line storage is access time – sub-second versus tape’s best 11-second access time. However, all other features have significant challenges when compared to today’s tape technologies; these include overall cost, media capacity, total footprint per terabyte, and throughput (read/write speed). In addition to HSM, several other

specialized storage architectures were analyzed— such as cheap ATA (Advanced Technology Attachment) disk and Content Addressed Storage. These alternative technologies will be revisited when making this decision.

Proposed Solution: As HSM adds a level of complexity and adds expense to the project it is not recommended at the initial roll-out phase, but will be re-evaluated in subsequent phases as storage requirements continue to grow and data access patterns are better understood. “Cheap Disc” ATA storage will be utilized at the start-up of the Digital Archives. As the initial storage capacity is exceeded, HSM –whether utilizing tape or optical drives -- will be evaluated for expansion of the Digital Archives.

- ***Tape Library.*** Tape remains a viable technology and continues to evolve in the areas of reliability, capacity, performance, and cost-effectiveness. There are a handful of proven and reliable tape options, all which meet the business backup/restore requirements for both speed and capacity. Hierarchical Storage Management (HSM) and other data-recall tape features (i.e. time to access data located anywhere on the tape) will also be considered in the future. Additionally, the tape format roadmap, library support, “write once” feature-set, and backwards-read compatibility will also factor into the final decision. The Archives will use a tape library as the foundation of the automation behind the backup/restore process, as well as the optional HSM functionality in the future. The use of robotic tape libraries provides the automation required to expedite and simplify access to archived data in an efficient manner. There are three industry-leading tape library vendors; each can satisfy the requirements of the project. Important decision criteria include integration of the selected tape format, support by the selected backup (and optional HSM) software, and scalability and manageability of the selected library (including ease of ejecting tapes for off-site rotation) to meet both initial and future near-line data storage requirements. The backup/restore segment of storage software is a very crowded category with literally hundreds of products to choose from. It is often difficult to differentiate among features and benefits of each product. The Digital Archive’s storage requirements mandate an enterprise-class backup software product that provides ease of use as well as industry-proven reliability and scalability (in combination with the selected tape library and drives).

Proposed Solution: Magnetic tape is recommended as the near-line format to backup and protect the Digital Archive’s data. A multi-bay tape library based on a well established industry standard will be used along with enterprise-class backup software. Both the tape library and the backup software will be compatible with HSM, as well as scalable to meet future needs.

- *Storage Management Tools.* There are many approaches to storage management; some solutions are proprietary and tightly integrated into the selected hardware or software, while other solutions are stand-alone, from vendors independent of the hardware or software selection. Industry averages vary depending upon the environment and staff skill-set, but it is generally accepted that a storage administrator can manage between two and ten terabytes without special third-party storage management tools.

Proposed Solution: As the initial deployment will have less than 10 TB of storage, the Digital Archives will use native, integrated management tools during the initial phases of this project. As the storage capacity increases, the Digital Archives will investigate stand-alone storage management tools to more effectively manage the growing and more complex environment, which may or may not include HSM.

Index and file database

- *Archiving Content.* Record and Content Management Systems provide the ability to centralize the storage of records into a repository where common services such as *capture, secure, maintain* and *workflow* are applied consistently. They also provide flexibility in decentralizing components to support scalability and changes in the environment. A management system is the preferred method of maintaining records for preservation purposes. There are open source frameworks from which a custom management system can be developed that offer lower upfront costs; however, the long term development costs and functional design specifications and development cycles may be more costly. Records should be stored in a way that minimizes dependence on specific hardware or software resources. Electronic archiving standards exist, such as (Department of Defense) DoD 5015.2, which present a uniform requirement for any records to be accessioned into the database.

Records are often maintained in their original format. However, it is common practice to generate renditions in alternate formats to facilitate search and retrieval. A preferred long-term format for storing records is XML (Extensible Markup Language), where data is “wrapped” with descriptive tags which can be used to manage the retention, security, accessibility, and retrieval of records. XML is a viable format for digital preservation projects because it is “self-describing” and flexible. Additionally, XML is non-proprietary and is supported by all major software vendors. A large volume of data in the Digital Archives will consist of unstructured content, including text and image files created by a variety of applications. The ability to “tag” these files with appropriate metadata that accurately describes the contents and allows them to be searched, as well as the ability to render and display these documents, is a critical requirement.

Proposed Solution: The Digital Archives will deploy at the Archives facility, a content management system with a web interface to store the electronic records and allow these to be searched. Electronic records brought into the Digital Archives will be converted into an XML format with defined metadata fields that will facilitate comprehensive searches. Individual agencies will have the option of incorporating a compliant content management system into their agency or using XML wrapper applets. Best practices will be established for the use of metadata, with fields and accepted abbreviations defined. Partner agencies will be expected to follow the metadata formats specified to facilitate accurate searching capabilities.

- ***E-mail Records.*** In addition to non-structured content, the Digital Archives will archive e-mail records. There are two implementation decisions to make: stand-alone versus integrated tools, and server versus client side. An integrated management system with e-mail archiving built-in provides a consistent management interface for capturing and managing all records. Several management systems provide e-mail archiving capabilities in their base product offerings. While stand-alone e-mail archive solutions provide considerable benefits to the IT community and appear to also provide a greater feature set than integrated offerings, they do not natively offer a mechanism to extract a record from its repository into a records management system. Additionally, e-mail archiving can be implemented either on the server-side or the client-side. The server-side management system has to process all mail to determine what is, or is not, a record, but does not require user interaction. Client-side systems capture only those e-mail messages and attachments that are determined to have archival significance, but require user involvement.

Proposed Solution: The Digital Archives will implement a server side capture of identified individual's email, as defined in the MOU with participating agencies. Whether the product used will be stand-alone or integrated will depend largely on the content management software package chosen. The Digital Archives team will continue to monitor and contribute to the DIS EARS project, as it may reflect an opportunity for extracting archival email from a centralized DIS source in an automated and cost effective manner.

- ***Web Content and Websites.*** As the value of data in web sites and the significance of the content and contextual representation of that data are recognized, it is desirable to be able to retain it for preservation purposes. Options for preserving web content are: saving web files off onto an archive share/folder or using a 'spider' utility to extract the files through an external web interface. Saving files to a share folder requires manual intervention and can be done every time the web page is modified, whereas spiders are more of an automated process that is run externally.

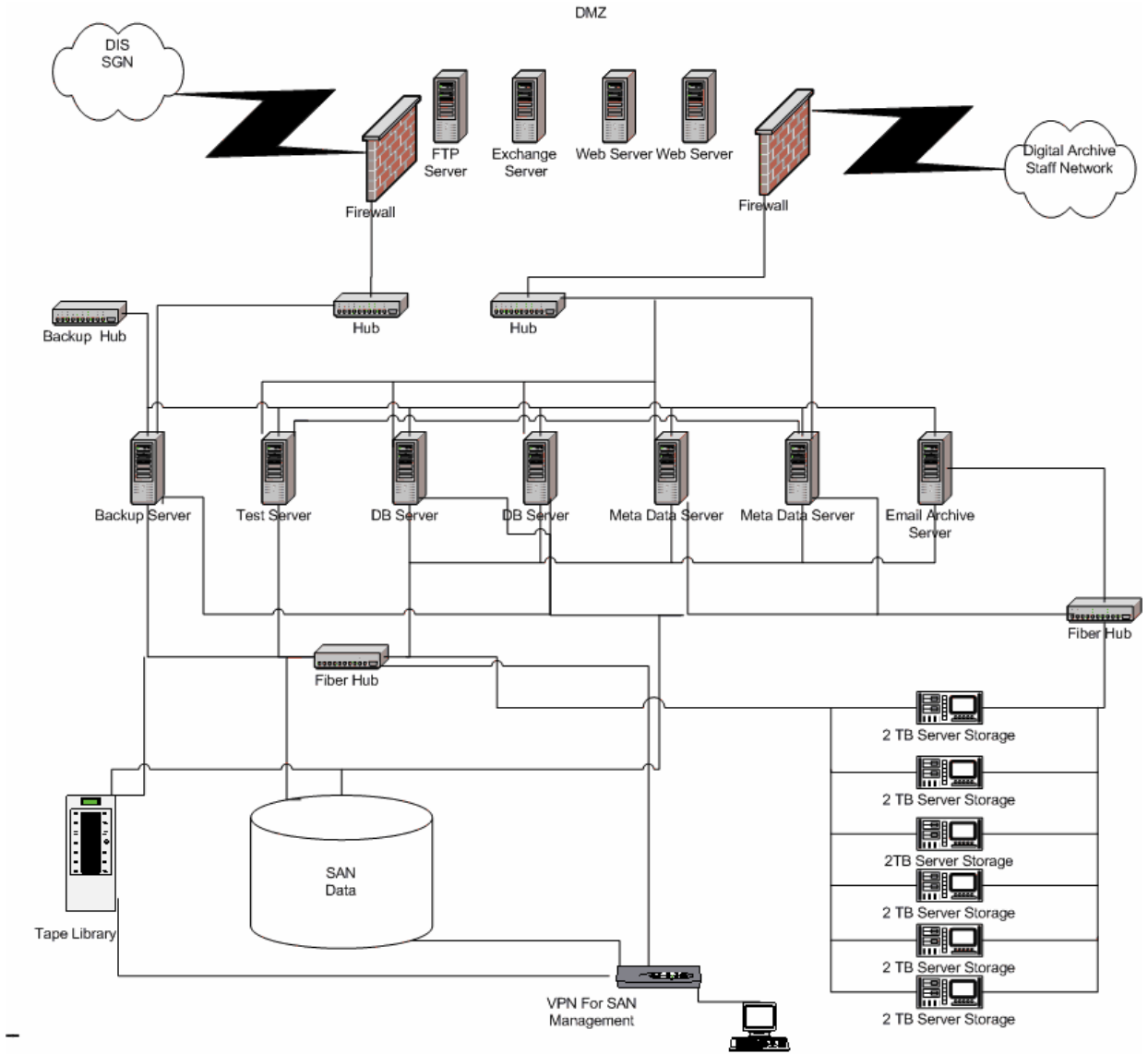
Proposed Solution: The Digital Archives will deploy web spiders to capture agency web sites at a specified frequency, as defined in the MOU with participating agencies. Whether the spider used will be stand-alone or an integrated package will depend on the content management software selected. Best practices and procedures will be created that establish how deep to “spider”, how to handle links to external sites, and make recommendations as to object types that can be successfully captured. Partner agencies will be expected to follow these practices in order to facilitate efficient web spidering.

- ***Databases and Corresponding Records.*** Databases are unique to the archiving paradigm in that they are containers within themselves and do not facilitate migrating content with contextual information into another repository. One approach to archiving databases is to extract database information into a format such as XML that adequately gathers metadata as well, then saving data to a medium that is transferable to the Digital Archives. Another option is to extract data via an ODBC (Open Database Connectivity) interface into a content management system. As a method of last resort, databases can be converted into ASCII format, although this method loses much of the native database functionality.

Proposed Solution: Whenever possible, the database will be converted into an ODBC format with an XML version saved, with metadata, into the content management database. For those databases of historical importance that cannot be converted, third party vendors can be contracted to create ‘translators’ which will allow legacy databases to be converted into a more usable format.

Exhibit C

Proposed System Architecture



Establish Policies and Best Practices. Electronic records serve a variety of purposes. It would be optimum to preserve both the “look and feel” as well as the meaning of the contents. Elements of preservation need to be articulated as do processes and methodologies for capturing, storing and retaining records. A consistent approach to applying metadata, establishing a file plan and hierarchy, implementing security, and workflow processes regardless of record type will need to be created. Experiences of several other organizations that have undertaken similar projects provide common themes. The majority of the challenges these organizations faced were related to proper design of the file plan and hierarchy, establishing policies, and acceptance by and training of the user community. Throughout the entire process, document integrity with chain of custody will be documented and secured to prove authenticity of the electronic record. This will allow the Digital Archives to certify that the records in their custody are true and original copies.

Proposed Solution: The Digital Archives is drafting a WAC, with strong stakeholder input, to ensure that electronic records are treated with the same care and preservation that paper records now have. Furthermore, as the project develops a ‘best practice’ manual will be developed as a guidebook for archiving electronic records, and will encompass desktop documents, email, databases, and web pages.

2. Converting from Legacy Hardware and Software

Overview

The most cost-effective solution for long-term media conversion for the Digital Archives will be a combination of establishing a hardware lab for ongoing conversion work, supplemented by periodic outsourcing of media conversion and translation. Outsourcing will be considered when the cost of hardware acquisition, software acquisition, and/or software development exceeds the cost of outsourcing to an external vendor.

- The hardware lab for long-term conversion work will include hardware and software for the most common, widely available, and still-used storage formats (magnetic drives and tape, digital tape).
- The data conversion portion of the Digital Archives project is very feasible, despite the relative immaturity of standards for data conversion. The Digital Archives will begin by capturing and converting data into a neutral, archival digital form, using the formats discussed and recommended in the following sections.
- Moreover, while there are a number of standards and formats available, the Digital Archives will periodically revisit these standards and formats, and consider proactively converting to better formats as they emerge.

Conversion Hardware, Software, and Service Bureaus

The market for media conversion can be divided into three major components:

- Software – Currently available to allow Windows-based systems to access data stored on tapes, cartridges and other media in heterogeneous media system arrays. Data can be saved to a network, hard drive or burned to a CD or other media for later conversion to the appropriate archival format.
- Hardware – Also widely available and offered by a large number of vendors – each with a wide array of new and refurbished devices for reading magnetic media. While many vendors specialize in specific media (such as nine-track systems), there are several vendors that maintain a varied stock of new and refurbished drives for one-stop shopping.
- Service Bureaus - Offered by a plethora of companies providing services to move media off-site, or to transfer it to hard drives (or the media of your choice). They range in size from one-person shops, to medium-size businesses with banks of tape arrays, to agencies and corporations with off-shore processing facilities. These services can also include “computer forensics” experts who will assess the quality of archaic media, and can also retrieve data from damaged media.

There is not a single, monolithic approach to conversion. Researchers and archivists have a number of options for content conversion methods and target formats. In some cases, document material is captured as page images only, sometimes as page images with full text captured for search and retrieval, and sometimes in a neutral format such as XML for later reprocessing. PDF-A is an emerging potential standard, but is in the earliest planning stages and will not be available as a draft standard until the summer of 2004.

Proposed Solution: The Digital Archives will look at a combination of these approaches both initially and over time. Appropriate hardware will be acquired for those media types that are in abundance. In terms of software solutions, the Digital Archives will focus on general purpose data conversion tools that convert multiple proprietary document and data formats into a neutral format, such as XML. The Digital Archives will rely on several different methods for converting various legacy materials—such as, using page image scans plus encoded text for land records and cultural collections, and full text for legislative, birth, and death records. In terms of service bureaus, the Digital Archives will competitively bid potential projects to companies that have established track records in government archival work.

Proof of Concept Testing

The Digital Archives has conducted some initial proof of concept testing for the data conversion processes, e-mail archiving and web spidering.

- *Legacy Conversion.* For proof of concept testing legacy files, the Digital Archives team concentrated on files created on the Intel/PC platform. A sampling of about 100 files was taken from the Office of the Secretary of State and the State Library Networks, and files turned in to the state

archives by state agencies. Samples selected included files from the Governor Lowery's Office, Senate Floor debates, and the Insurance Commission. These selected data files represent a mix of simple to complex formats dated from 1991 to 2003. These files were also given to several file conversion vendors by Glasshouse, our consultant on the Digital Archive Project.

For in-house testing, the following vendor products were used:

- Stellent Outside IN
- XML Export Outside In

The Stellent product supports over 225 input file formats and is used in many e-mail systems such as Microsoft Exchange and Novell's GroupWise product.

XML Export leverages the power of XML and Outside In Technology to deliver all information about a document's contents, presentation information, and metadata to an application developer. XML Export Outside In normalizes all of the information to an XML schema provided in the form of a DTD. The application can either directly consume the XML or further transform it to a schema specified by the application developer.

97% of all documents converted from native formats to XML had no change in format, feel or function.

Several different Legacy Hardware configurations were used in order to recover a file off of an obsolete media format, depending on the format. This allowed the Digital Archives team to move the file to a current IT standard hard-drive, CD-ROM, or by a server system for processing.

Approximately 97% of the files tested could be converted with equivalent look and feel of the original document. On a few documents containing internal links to a support file, if the file was not found, parts of the original document would be missing pieces. Additionally, some files would have minor changes in formatting. The formatting changes were due to the differences caused by how various software packages handle software-formatting codes. This can be corrected manually or by having a custom macro modify the file back to the original style

Research conducted by the Secretary of State's Office and Glasshouse, an independent technology consulting firm, revealed that most of the files to be archived can be converted in-house or sent to a file conversion service provider at

reasonable cost. As a result of this research it was determined that the plan to take legacy files in to the Digital Archives is feasible.

- *E-mail Archiving.* Tests were conducted for two different methods of e-mail archiving of the Secretary of State's Novell GroupWise and Microsoft Exchange system to an offsite Microsoft Exchange 2000 system.

Client side. Client side is based on using a forward, or delegation rule, set on a individual's e-mail account such as Outlook or GroupWise desktop client. This set of rules can be set by an individual or the e-mail administrator for both sending and receiving of e-mail. The rule function setup works by matching a set of conditions then forwarding the e-mail to the Digital Archive's e-mail server for processing.

Server side. Server side is based on using the journaling feature on the Microsoft Exchange server. The journaling feature works by capturing copies of user's messages within the Exchange system. Journaling lets an administrator capture all messages to another recipient (i.e., mailbox, custom recipient, or public folder) as soon as anyone submits or receives the message. The daily journal is then removed from the exchange server on a regular basis for processing at the Digital Archive. This function is not available on the GroupWise system.

Both the client side and the server side proof of concept tests function effectively and accurately. All targeted emails were successfully moved to the remote server, where they could then be searched, printed or converted into another format.

- *Web Spidering.* Several off-the-shelf web spidering utilities were tested by mirroring the OSOS external website onto a CD. Several of the utilities have advanced option capabilities allowing the selection of depth of spidering, servers to explore, frequency of spidering, and types of files to download. Based on the testing conducted, the Digital Archives team is very confident that spidering a web site using stand alone software that captures content, links, metadata and files is possible. An integrated product that performs as a function of the chosen content management system will expand the capabilities of the Digital Archives to preserve web content.

Based on the testing conducted, the Digital Archives team is very confident that spidering a web site using stand alone software that captures content, links, metadata and files is possible. An integrated product that performs as a function of the chosen content management system will expand the capabilities of the Digital Archives to preserve web content.

The Office of the Secretary of State's external web site — consisting of over 1200 files and 100 MB of data — was successfully spidered using an off-the-shelf commercial web spidering utility, in less than 3 minutes.

3. Delivering Digital Content Via The Web

- *Web Servers.* The Digital Archives will contain one or more web servers running Windows 2000 and/or Windows 2003 server with IIS. Because the storage of media will be handled by the SAN system, they will handle HTTP requests and not be used solely for direct storage purposes. The system will have sufficient bandwidth available for the transfer of archival data. This same connection will be able to accommodate all web site visitors with no problems in network traffic. If increased server power is needed, additional web servers can be purchased and load balanced in order to handle the increased load. The servers will be monitored remotely by designated Secretary of State web staff, with additional hardware support by on-site IT administrators.
- *Enterprise-Level Database.* The system for delivering media and the subsequent database structure will be created and run on Windows 2000 SQL Server according to currently implemented OSOS standards. The database servers will be kept locally at the Digital Archives and maintained by designated IT staff, with additional hardware support by on-site IT administrators. Supplemental graphics and images will be stored on the SAN system (archival media) and/or the web servers (supported images/media for web sites, etc.).
- *Programming.* The web site used to deliver archival media will be created and maintained by designated OSOS web staff. Microsoft .NET technology will be used to deliver this content which may include a variety of tools including XML, Web Services and SOAP to deliver archival media and metadata associated with that media based on specific customer needs as they are identified.
- *Other Digital Content Areas.* Because of the unique nature of the Digital Archives, with a large and growing collection of data types and files needing to be accessible to customers, the web site will need to remain flexible to successfully deliver the dynamic content. Therefore, various technologies may need to be used to address various situations as they arise.

4. Phased Implementation

The Digital Archives project is planned in four staged phases, each phase building on the knowledge and experience of the previous one, while increasing the robustness and capacity of the system architecture.

Phase One will consist of initial rollout of the SAN Architecture and content management system at the Digital Archives. During the initial phase, one records series at the local level will be identified and accessioned into the Digital Archives from all 39 counties. Depending on the IT capabilities of the local agency, the records series will be transmitted via direct network connection through the firewall, FTP or through disc/tape. Additionally, the Office of the Secretary of State (OSOS) will be the pilot agency to test the remote accession capability of the content management system. As the OSOS will be connected to the Digital Archives content management application, many of the records processes will be automated. Appropriate policy makers in the agency will be identified and their emails will be archived at the server side and automatically sent to the Digital Archives. The agency web page will be spidered by the Digital Archives on a periodic basis. Based on the results of this three pronged approach (content management, email archive and web spidering) the best practices manual will be developed and expanded to serve as the electronic archiving guide for future partner agencies.

Phase Two will begin with MOUs being signed by 2-3 state agencies and 2-3 local agencies. The agencies will be selected carefully among those that already have a strong technological presence in their agency as well as one or two that have very little technological ability. At least one of these partner agencies should have a content management system in place (preferably different than the Digital Archives content management system) that will allow for automated, remote transmission of electronic records to the Digital Archives. Two to three of the partner agencies will utilize an XML applet to wrap their archival records with metadata and transmit the packages to the Digital Archives by FTP. Lastly, one partner agency will create text files with the appropriate metadata tags and send these records to the Digital Archives by way of CD, Tape or diskette. Digital Archives staff will be working closely with partner agencies to provide technical support, as necessary. By careful selection of the phase two agencies, multiple access points to the Digital Archives will be tested and processes refined. During phase two, internet access to the records stored at the Digital Archives will be made available to the public in a highly structured, searchable format. The best practices manual will continue to be refined based on findings from Phase Two.

By the beginning of **Phase Three**, multiple accession methods will have been tested (Content management, FTP, manual entry) so the focus will be on targeting specific agencies which generate records of known archival value (such as Governor's office, Legislators, Judiciary, etc). MOUs will be reached with each

of the target agencies and Digital Archives staff will train the agency staff in the processes required to archive records, providing any technical assistance that may be required.

Phase Four will focus on signing MOUs (Memorandums of Understanding) with all other interested (again, makes it sound really voluntary – let’s clarify) state and local agencies, and shifting more of the less technical agencies to a more automated process. Phase Four will also continue to focus on capturing and archiving email from policy makers in all the major agencies at the state level.

IV.d. Risk Assessment

Severity and Risk Matrix

The Severity and Risk Matrix (Exhibit D) was reviewed by the agency with the assigned OITO technology consultant. The resulting overall ranking of project indicated medium risk (Level 2) using the criteria in the matrix. Comments below each Dimension evaluated provide additional explanation on the risk level ranking.

Overall, although the project will be deployed across all state and local government agencies, this project represents primarily a difference in the *format* of the records being archived; the requirements and processes for archiving government records (primarily paper records) has been in place for a long time. The project will employ technologies that will not require large initial investments by client agencies and will be designed to work in the background in an automated manner without manual intervention on the part of client agencies. The project will utilize primarily off-the-shelf technology and applications, with limited customization. Such technology did not exist a few years ago but is increasingly available to meet the needs of this project.

Risk Management Matrix (Exhibit E)

The Risk Management Matrix includes agency-identified potential risks, the impact of those risks (should they occur), the likelihood of occurrence and the steps the agency will take to mitigate against those risks.

Exhibit D

Severity Level Criteria: Overall Ranking of 2.5

The severity matrix assesses the proposed project's impact on citizens and state operations, its visibility to stakeholders, and the consequences of project failure.

Levels	Categories			
	Impact on Clients	Visibility	Impact on State Operations	Failure or Nil Consequences
High (3)	<ul style="list-style-type: none"> Direct contact with citizens, political subdivisions, and service providers - including benefits payments and transactions. 	<ul style="list-style-type: none"> Highly visible to public, trading partners, political subdivisions and Legislature. Likely subject to hearings. System processes sensitive / confidential data (e.g. medical, SSN, credit card #'s). 	<ul style="list-style-type: none"> Statewide or multiple agency involvement / impact. Initial mainframe acquisitions or network acquisitions. 	<ul style="list-style-type: none"> Inability to meet legislative mandate or agency mission. Loss of significant federal funding.
Medium (2)	<ul style="list-style-type: none"> Indirect impacts on citizens through management systems that support decisions that are viewed as important by the public. Access by citizens for information and research purposes. 	<ul style="list-style-type: none"> Some visibility to the Legislature, trading partners, or public the system / program supports. May be subject to legislative hearing. 	<ul style="list-style-type: none"> Multiple divisions or programs within agency. 	<ul style="list-style-type: none"> Potential failure of aging systems.
Low (1)	<ul style="list-style-type: none"> Agency operations only. 	<ul style="list-style-type: none"> Internal agency only. 	<ul style="list-style-type: none"> Single division. Improve or expand existing networks or mainframes with similar technology. 	<ul style="list-style-type: none"> Loss of opportunity for improved service delivery or efficiency. Failure to resolve customer service complaints or requests.
Ranking	2.0	2.5	3.0	2.5

Washington State Digital Archives Investment Plan

Levels	Impact on Clients	Visibility	Impact on State Operations	Failure or Nil Consequences
Comments		<ul style="list-style-type: none"> • Project is intended to be an ongoing effort & work seamlessly background without burdening state/local government agency staff. • Project will likely be of interest nationally to other state & local governments. 	<ul style="list-style-type: none"> • It is not anticipated that state and local governments will have to purchase hardware. • The technology is not high risk. • The 3.0 ranking is solely because the initiative will be deployed statewide. 	<ul style="list-style-type: none"> • Failure to implement would increasingly result in an inability to meet the agency's legal mandate for records management including digital assets. • However local governments will retain records needed for daily governance and use. • Daily government operations will be able to continue to function if system is down. • Records could mostly be downloaded to paper in the short term if needed for access.

Risk Level Criteria: Overall Ranking of 2.0

The risk matrix measures the impact of the project on the organization, the effort needed to complete the project, the stability of the proposed technology, and agency preparedness.

Levels	Categories			
	Functional Impact on Business Processes or Rules	Development Effort & Resources	Technology	Capability & Management
High (3)	<ul style="list-style-type: none"> Significant change to business rules. Replacement of a mission critical system. Multiple organizations involved. Requires extensive and substantial job training for work groups. 	<ul style="list-style-type: none"> Over \$5 million. Development and implementation exceeds 24 months.* Requires a second decision package. <p>*Clock starts after feasibility study or project approval and release of funding.</p>	<ul style="list-style-type: none"> Emerging Unproven Two or more of the following are new for agency technology staff or integrator, or are new to the agency architecture: programming language; operating systems; database products; development tools; data communications technology. Requires PKI certificate. Complex architecture-greater than 2 tier 	<ul style="list-style-type: none"> Minimal executive sponsorship. Agency uses ad-hoc processes. Agency and/or vendor track record suggests inability to mitigate risk on project requiring a given level of development effort.
Medium (2)	<ul style="list-style-type: none"> Moderate change to business rules. Major enhancement or moderate change of mission critical system. Medium complexity business process(es). Requires moderate job training. 	<ul style="list-style-type: none"> Under \$5 million but over agency delegated authority. 12 to 24 months for development and implementation.* <p>*Clock starts after feasibility study or project approval and release of funding.</p>	<ul style="list-style-type: none"> New in agency with 3rd party expertise and knowledge transfer. One of the technologies listed above is new for agency development staff. 	<ul style="list-style-type: none"> Executive sponsor knowledgeable but not actively engaged. System integrator under contract with agency technical participation. Agency and/or vendor record indicates good level of success but without the structure for repeatability.

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<p>Low (1)</p>	<ul style="list-style-type: none"> • Insignificant or no change to business rules. • Low complexity business process(es). • Some job training could be required 	<ul style="list-style-type: none"> • Within agency delegated authority • Under 12 months for development and implementation.* <p>*Clock starts after feasibility study or project approval and release of funding.</p>	<ul style="list-style-type: none"> • Standard, proven agency technology. 	<ul style="list-style-type: none"> • Strong executive sponsorship. • Agency and vendor have strong ability to mitigate risk on a development project. • Project staff uses documented and repeatable processes for tracking status, problems, and change. • Agency or vendor is CMM Level 3 equivalent or above.
<p>Ranking</p>	<p>2.0</p>	<p>2.0</p>	<p>2.0</p>	<p>2.0</p>
<p>Comments</p>	<ul style="list-style-type: none"> • Archiving principles & work processes will not significantly change: the primary change will be the format of the records (electronic vs. paper). • System will be designed to work seamlessly in the background without burdening state/ local governments' agency staff. 		<ul style="list-style-type: none"> • Some technology (e.g. SAN operation) will be new to agency staff. Currently & increasingly, these are off-the-shelf tools & technology solutions that did not exist a few years ago. 	<ul style="list-style-type: none"> • Phased implementation of the project will help ensure success. Agency has recent history of successful implementation of complex technology projects. • Expect technical consultation is being utilized to augment agency IT staff knowledge & experience.

Exhibit E

RISK MANAGEMENT MATRIX

Risk	Impact	Likelihood of Occurring	Mitigation Plan
Local and state government client agencies may demonstrate some resistance to archiving of electronic records	High	Medium	The WAC 434 governing Archives will be revised with participation from all stakeholder groups to ensure their understanding of requirements for archiving electronic records and that the requirements are doable. With client agency involvement in development of the rules, we anticipate a sense of ownership on their part and an additional desire to participate. The Secretary of State will meet with management of state and local agencies, working with them to determine which records are of archival value and the method by which they will be transmitted to the Digital Archives. Processes will be established to allow for transmittal of records with a minimum of manual intervention, and instead focus on automated processes that will require initial set up only. A Memo of Understanding will be written, at least initially, with participating agencies. Digital Archives staff will be available for assistance. The project will be phased in, beginning with only a few agencies to allow for successful piloting and provide other agencies with proven practices and methods prior to full implementation.
Inability to import and use legacy data due to outdated technology	Low to Medium	High	At a minimum, the Digital Archives will be able to convert data to the lowest common denominator (ASCII). The Digital Archives plans also include a legacy equipment lab that can be used for conversion and/or use of outside commercial conversion services if necessary. The percentage of unreadable data will decrease over time.

Washington State Digital Archives Investment Plan

Risk	Impact	Likelihood of Occurring	Mitigation Plan
State and local government client agencies may need to utilize/learn some new technologies.	Low	Medium (High for medium to small size agencies)	The Digital Archives will strive to capture data in current systems, rather than force state and local governments to convert to a new technology. Digital Archives staff will provide technical assistance, on-site when required. Training documentation that is easy to read and use will be provided, and some of the local government archives training dollars can be used to assist with local government training. If customer agency training needs exceed current budget, we will consider seeking additional appropriation authority from dedicated revenue streams in the future to provide such training.
Archival data will be centrally stored in a mass storage system (SAN), potentially subject to loss of power and data corruption.	Medium	Low	SAN will be vendor installed and staff will be fully trained. The SAN will be protected by redundant power sources (generator, UPS), RAID 5, a backup tape library, including off-site storage. Data will be able to be fully restored if necessary. If the system were temporarily down, there would be no cost consequences to client agencies and staff would still be able to respond to customers to fill any emergent needs.
There is no universal content management system used by state and local government client agencies. Lack of a universal system necessitates more manual and less automated systems for capturing, managing and preparing data for inclusion in the archives so that the data can be easily searched and retrieved.	Medium	Medium	The agency will not immediately impose universal use of a content management system. The Digital Archives will utilize a combination of off-the-shelf applications, sound data structure and processes, use of content management software at the Digital Archives and manual processes to manage and prepare the data. The agency will continue to work with client agencies in how to manage their content.

IV.e. Quality Assurance Process

The Office of the Secretary of State, in seeking approval for the Washington State Digital Archives project, agrees to abide by the principles of *Responsibilities and Obligations for Quality Assurance* as adopted by the state. A Quality Assurance Plan is required for this project by legislation, with the intent of ensuring that the project is successfully completed, with success factors including accomplishment of the functionality, meeting the anticipated schedule and budget parameters.

- ***Feasibility Study*** The agency has engaged in extensive investigation and analysis in preparing the Washington State Digital Archives Feasibility Study and the Washington State Digital Archives Investment Plan. All efforts were geared toward presenting a high quality and reliable business analysis of alternatives for meeting the objectives of the project.

Acquisition of expert consulting services, procured through an RFQQ process. GlassHouse Technologies, Inc. of Framingham, Massachusetts, was selected to assist the agency with the following:

- analyzing the technical feasibility of the project;
- identifying and describing the range of technical options available, the advantages and disadvantages of each, and the key decision points for narrowing the options;
- assisting the agency in conducting a requirements analysis to narrow the options to those that will best suit the business needs of the agency;
- preliminary identification and evaluation of key vendors, manufacturers and products that may meet agency specifications;
- design of a reference architecture and cost estimates

Regular progress reporting with our Office of Information Technology Oversight (OITO) consultant.

In addition, agency staff have attended DIS briefings and presentations on the DIS Email Archiving and Retention System (EARS) project, and initiated a joint meeting to discuss strategies for integration and coordination.

Regular, weekly meetings of project team.

Weekly meetings are used to review progress, establish milestones and deadlines. The Assistant Secretary of State attends all weekly meetings and serves as executive sponsor for the project.

Targeted training for key agency staff.

Agency IT staff members continue to actively acquire additional knowledge and training that will be required in order to plan and implement the project. As an example, IT staff members have, and continue to acquire, SAN knowledge through formal training classes, attendance at conferences, and on-

site visits with both public and private organizations where SAN solutions have successfully been implemented. Examples include:

- Microsoft Exchange 2000 training to increase knowledge in email archiving;
- Cisco and IBM SAN Solution workshop;
- On-site visits to the National Archives, Weyerhaeuser and state agencies using SAN technology;
- On-site visits to vendors such as ADIC and EMC to increase knowledge of different SAN solution product lines;
- Brocade Fiber channel workshop to increase knowledge base on fiber channel products and their configuration;
- Managing Electronic Records training;
- SQL Server Administration training;
- Windows 2000 Server training;
- Training on Cisco router configuration

Agency staff will participate in training in SAN technology, content management, electronic records management, XML and metadata, and other appropriate subjects. Initial intensive training will occur July 2003 – January 2004, with ongoing training as technology evolves.

Hiring of staff with specific knowledge and technical skills.

The legislature authorized some funding for hiring additional key staff to help ensure successful implementation of this project. One of the new positions, the state's Digital Archivist position, is on board and has been able to work with the project team and the consultants on development of the feasibility analysis. Additional technical staff hires are in process.

- ***RFP Process.*** The Request for Proposals (RFP) process will provide another opportunity to refine and/or clarify stated requirements. The RFP process will be initiated following ISB approval of the project and will be used to acquire the hardware and software required by the project. Specific steps that will help ensure a successful outcome for the RFP process include:

Requirements analysis facilitated by GlassHouse Technologies.

This effort provided a targeted requirements definition based on project service objectives and technical direction. In addition, a reference architecture has been developed based on the gathered requirements. This reference architecture, based upon specific requirements, will be reviewed prior to the RFP process, further refined as needed, and incorporated into the RFP process to ensure that bids received conform to specific agency requirements for functionality.

Pricing estimates are based on the requirements analysis and developed with assistance by industry experts.

Price estimates are highly accurate for the initial implementation phase. Accurate price estimates from the outset will help ensure that the project stays within the project budget and avoid surprises.

Use of successful RFP examples in state government.

The agency will work closely with our OITO consultant, other units of DIS and other agencies to develop a successful RFP that will provide the desired results. Consulting assistance from public or private sources with a track record of developing successful RFP documents may also be utilized.

Pre-bid proposal conference(s).

A pre-bid proposal conference will be held to assure clarity of requirements and common understanding among potential bidders.

- ***Bid review and contract negotiation***

A thorough review process.

Individuals with technical expertise, business/management background and program specific knowledge will be part of the review team. Review team members will include agency staff as well as possibly expertise from outside the agency (such as staff from DIS). Reference checks and bidder interviews will augment the review of the written bids.

Contract negotiation and development will ensure that all requirements are retained.

The intent will be to ensure that there is no opportunity for compromise in the quality of the product/solution, timeline or budget.

- ***Project Execution***

The agency will retain a quality assurance contractor.

The contractor will be obtained through a competitive procurement process, and may utilize the state's master contract process, supplemented by state agency references and evaluations of contractors. A quality assurance plan will be a deliverable from the contractor during the initial phase of the project and must be approved by the project team.

Continued training of key staff and hiring staff with needed expertise and knowledge.

Training will help ensure that the agency has the skill sets to initially implement and expand the project through full implementation.

Phased implementation.

As described in Section IV.c., phased implementation of the technology will help ensure project success by implementing the project in manageable stages such that each successive phase will be implemented only after successful implementation of the previous one. This will also allow the agency to manage expectations from client agencies.

Continued involvement of OITO consultant.

This will be important during project implementation. The agency looks forward to an ongoing relationship geared towards ensuring project success.

SECTION V: ACQUISITION PROCESS

V.a. Conformity with Technical Policies and Standards

The Digital Archives project is being executed within the framework of the OSOS IT Portfolio, and focusing on compliance with DIS policies. The project has been built on a strong business case of providing long term, archival storage of electronic records for state and local agencies using proven technologies for mass storage. By centralizing the storage of archival electronic records, overall storage costs are reduced while adding measurable value to the records in terms of access to the government sector, as well as to the public. Furthermore, state and local government agencies are legally mandated to provide long term storage and access to their electronic records, which currently is difficult to do and inconsistently executed.

As stated, the project has been designed to comply with DIS policies on project management, in that it:

- Has strong executive management support
- Lends itself to incremental development
- Supports the agency strategic plan
- Feasibility study conducted with assistance from private-sector experts
- Risks and mitigation strategies identified.

In addition to the feasibility study, a cost-benefit analysis was conducted, as well as proof-of-concept testing. Throughout the entire design phase, the focus has been on maximizing the functionality, interoperability and scalability of the Digital Archives to ensure long term benefit from the initial deployment.

V.b. Use of Existing Agency IT Resources

The technical expertise required by the project will be provided by a combination of existing agency staff who contribute time and expertise to the Washington State Digital Archives Initiative, staff hired specifically to support the Washington State Digital Archives on a full-time basis, and outside technical consultants, as appropriate. The technical expertise required by the project includes, but is not limited to: expertise in the field of archives and records management, the ability to provide required technical support to state and local client agencies, expertise in converting data from legacy hardware and software, expertise to prepare data from client agencies, expertise to determine the archival value of digital data, and the ability to ensure continuous operation and data availability 24 hrs x 7 days x 52 weeks.

Internal IT agency staff resources include the areas of Applications, Network and Web support.

- Patti Prouty, Agency IT Applications Manager
Ms. Prouty has agency-wide responsibility for the agency IT portfolio. Patti is responsible for ensuring that the Washington State Digital Archives Initiative conforms to the portfolio and agency standards. She will oversee the development of any in-house applications, working with other agency applications staff as needed. She will coordinate with the Digital Archivist on long-term IT goals and special projects. Patti will continue to serve as a primary liaison with DIS and their Customer Advisory Board, stakeholder groups, on project-related issues. Finally, she will work with the agency and project-specific web masters on providing web-based content, specifically database security and database standards.

Ms. Prouty is supported by additional applications staff including: Brooke Barnes (ITSS-1), Dale Edwards (ITAS-3), Jeff Prentice (ITAS-3), and Samreth Sam (ITAS-3)

- Michael Huntley, Network and Desktop Services Manager
Mr. Huntley serves as the consultant to the State Digital Archives team regarding overall network administration and operations, and provides system trouble-shooting to both the agency and vendors to ensure seamless network operations.

Michael has over nine years of experience in network operations and desktop support. For the past four years, he has been responsible for managing the agency's internal and external network infrastructure, hardware and software equipment acquisition, network security, virus protection, upgrade and maintenance of all desktop, as well as server hardware and software. Michael is also charged with ensuring the agency receives the highest standard of customer service set forth by the Deputy Secretary of State.

Mr. Huntley is supported by Paul Longwell (ITSS) and Larry Gratton (ITSS), both of whom are responsible for agency-wide network administration. Each has been extensively involved in the research and design for the State Digital Archives, including SAN configuration and conversion software research and testing.

Additional Network resource support includes: Ying Dao (ITSS), Everett Evan (ITSS), Debra Peterman (ITSS), Linda Powell (ITSS), and Adam Rech (ITSS).

- Matthew Edwards, Agency Webmaster

As the overall agency webmaster, Mr. Edwards will be creating and/or coordinating the creation of web sites and applications for the delivery of Archived media. This may include graphic design, user interface design, web programming, database design as well as web server administration and maintenance. Work will be accomplished in conjunctions with the Digital Archives IT Manager or other designated OSOS staff. Additional Web support is provided by Garann Means.

V.c. IT Resources to be Acquired

GlassHouse Technologies, Inc was engaged to assist the agency with some of the more technical aspects of the Washington State Digital Archives Feasibility Study, including SAN requirements and configuration, conversion of data from legacy hardware and software, and digital archiving technologies. These contractors, and others, will continue to be utilized as needed.

The Washington State Digital Archives project will primarily utilize commercially available hardware and software solutions, with limited initial requirements for custom development. As a result, most remaining decisions regarding the technology solution, involve selecting hardware and software from vendor options available that meet the business requirements of the project. See Acquisition Plan and Schedule for a more detailed discussion.

In addition to the technology acquisitions, the following internal staff positions will be recruited:

- **Network/SAN Specialist (recruitment in process)**
This position provides on-site, full time technical support for the Washington State Digital Archives Initiative. He/she will attend weekly status meetings; assists in developing the RFP for acquisition of technical solutions and bid review process; serve as liaison with stakeholder/customer technical representatives; maintains Storage Area Network and tape library. The position will also be responsible for network operations and security; expansion and coordinating IT issues with other agency IT staff assigned to the Washington State Digital Archives Initiative.
- **Archives Assistant (vacant)**
Serves as primary customer interface; assist clients with access and on-site research; provides administrative support to Washington State Digital Archives staff.
- **Electronic Records Manager (pending funding)**
This position will be assigned full time to the Washington State Digital Archives Initiative and will be responsible for development and management of record retention schedules, disposition of records, and ensuring the authenticity of electronic records.
- **Digital Archives Webmaster (pending funding)**
This position will be assigned full-time to the Washington State Digital Archives Initiative and will be responsible for Web enabling digital records; coordinating the indexing, retrieval and web-arraying of archived electronic records of state and local government agencies; assisting with SAN maintenance.

- **Programmer (pending funding)**

This position will be assigned full-time to the Washington State Digital Archives Initiative and will serve as the principle programmer for the Washington State Digital Archives in Cheney, WA. The position will be responsible for development of applications for connecting with remote locations and transmitting their electronic records to the Washington State Digital Archives; indexing and storing records; providing web-based retrieval.

V.d. Cost Flow, Benefit and Revenue Analysis

Cost information for the agency's selected alternative is provided for a 7-year period (5 years past the initial development phase). The 2003-2005 Biennium is considered "Year One". The Digital Archives is an ongoing agency program. Following the initial investment, the technology will require ongoing maintenance, update and eventual replacement. All costs are incremental, as this is a program that does not currently exist for electronic records.

The following information is provided:

- Cost Flow Analysis
- Hardware Related Cost Estimate Detail
- Software Cost Estimate Detail
- Software Cost Estimate Analysis
- Legacy system Conversion Cost Estimate Detail
- Rationale for Cost Estimates
- Discussion of Benefits

**COST FLOW ANALYSIS
PREFERRED ALTERNATIVE: PHASED IMPLEMENTATION**

Budget Category	Object	Development Phase		FY 2007	FY 2008	FY2009	FY2010	FY2011	Total
		2003-2005	FY 2006						
Personal Service Contracts	C								
- Quality Assurance		\$150,000	\$0	\$0	\$0	\$0	\$0	\$0	\$150,000
- Software integration, conversion, and automation		\$136,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$436,000
- HW configuration, integration, optimization		\$46,750	\$0	\$0	\$0	\$0	\$0	\$0	\$46,750
Hardware Maintenance	EE	\$13,044	\$18,197	\$24,161	\$192,603	\$178,846	\$269,466	\$287,039	\$983,356
Software Maintenance/Upgrade	EE	\$247,889	\$135,302	\$135,328	\$182,769	\$233,457	\$258,289	\$362,822	\$1,555,856
Goods & Services									
- Software training	EG	\$8,000	\$0	\$0	\$10,000	\$0	\$0	\$10,000	\$28,000
- Purchased Services	ER	\$67,000	\$134,000	\$134,000	\$134,000	\$67,000	\$33,500	\$23,000	\$592,500
Hardware Purchase									
- Capitalized	JC	\$1,238,472	\$491,822	\$347,616	\$303,067	\$773,829	\$483,673	\$835,760	\$4,474,239
Software Purchase									
- Capitalized	JC	\$665,413	\$201,560	\$101,410	\$350,050	\$386,295	\$25,000	\$148,881	\$1,878,609
- Non-capitalized	JA	\$5,000	\$5,000	\$6,920	\$5,000	\$2,000	\$0	\$0	\$23,920
TOTAL		\$2,577,568	\$1,035,881	\$799,435	\$1,227,489	\$1,691,427	\$1,119,928	\$1,717,502	\$10,169,230
60% local fee revenue (Biennial Total)			\$621,529	\$479,661	\$736,493	\$1,014,856	\$671,957	\$1,030,501	\$6,101,538
40% state revolving fund revenue (Biennial Total)			\$414,352	\$319,774	\$490,996	\$676,571	\$447,971	\$687,001	\$4,067,692
			\$734,126		\$1,167,566		\$1,134,972		

Washington State Digital Archives Investment Plan

Hardware Related Cost Estimate Detail

<i>Costs by Component</i>	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Enterprise Disk	\$781,121	\$254,869	\$254,869	\$402,864	\$446,192	\$592,242	\$680,039
ATA Disk Subsystem	\$0	\$266,198	\$62,746	\$85,228	\$121,962	\$138,312	\$313,135
SAN Fabric	\$118,330	\$0	\$5,064	\$140,064	\$83,024	\$5,064	\$43,878
Tape Library & Drives	\$198,329	\$32,423	\$12,713	\$12,713	\$78,313	\$15,818	\$78,313
Backup Solution	\$117,963	\$0	\$3,245	\$111,974	\$26,219	\$1,325	\$27,544
Consulting Services	\$46,750	\$0	\$0	\$0	\$0	\$0	\$0
Host Systems	\$76,500	\$8,000	\$25,000	\$0	\$210,000	\$16,000	\$33,000
Network Connectivity	\$350,000	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL	\$1,688,994	\$561,490	\$363,637	\$752,842	\$965,711	\$768,760	\$1,175,910

<i>Costs by Budget Category</i>	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Hardware Maintenance	\$9,360	\$12,713	\$17,777	\$185,319	\$170,662	\$261,282	\$278,855
Software Maint./Upg.	\$147,484	\$22,481	\$1,325	\$26,456	\$3,974	\$23,806	\$39,049
Personal Srv Contracts	\$46,750						
Hardware Purchase	\$868,007	\$481,822	\$342,616	\$298,067	\$768,829	\$483,673	\$835,760
Software Purchase	\$267,393	\$44,475	\$1,920	\$243,000	\$22,245		\$22,246
Other	\$350,000						
TOTAL	\$1,688,994	\$561,490	\$363,637	\$752,842	\$965,711	\$768,760	\$1,175,910

<i>Component Specifics</i>	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Enterprise Disk (TB)	3.00	5.00	7.00	11.00	15.00	21.00	29.00
ATA Disk Subsystem (TB)	0	3.60	8.60	13.60	22.10	30.60	45.60
SAN Fabric - ports	64	64	64	64	128	128	128
SAN Fabric - switches	2	2	2	2	4	4	4
Tape Library (TB cap)	120	120	120	120	150	150	180
Tape Library (slots)	400	400	400	400	500	500	600
Tape Media (carts)	450	600	600	600	750	750	900
Drives in Tape Library	4	4	4	4	6	6	8
Host Systems	9	9	9	9	(Replace 7) 16	16	16

<i>Total Terabytes</i>	Year 1	Year 2 (est)	Year 3	Year 4 (est)	Year 5	Year 6 (est)	Year 7
Tape Library	10	28	45	103	160	255	350
Storage Array Disk	3	8.6	15.6	24.6	37.1	51.6	74.6

Software Cost Estimate Detail

Costs by Budget Category	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Hardware Maintenance	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Software Maintenance & Upgrade	\$99,505	\$111,021	\$131,303	\$152,713	\$225,523	\$230,523	\$319,813
Personal Services Contracts	\$144,000	\$50,000	\$50,000	\$60,000	\$50,000	\$50,000	\$60,000
Professional Services	\$136,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Training	\$8,000	\$0	\$0	\$10,000	\$0	\$0	\$10,000
Hardware Purchase	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Software Purchase	\$398,020	\$157,085	\$101,410	\$107,050	\$364,050	\$25,000	\$126,635
Other							
Total	\$641,525	\$318,106	\$282,713	\$319,763	\$639,573	\$305,523	\$506,448

Component Specifics	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Content Management	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Email Archive - # mailboxes	501	1001	2001	3001	5001	5001	6001
Content Contributors	100	600	600	1100	1100	unlimited	unlimited
Content Viewers	1001	unlimited	unlimited	unlimited	unlimited	unlimited	unlimited
Web Spidering was included in 2 products							

Washington State Digital Archives Investment Plan

Software Cost Estimate Analysis

Year	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	Total Software
Software Costs								
Software Product A	\$155,000	\$101,500	\$131,250	\$0	\$487,500	\$0	\$0	\$875,250
Software Product B	\$154,750	\$37,125	\$55,125	\$0	\$78,750	\$0	\$179,750	\$505,500
Software Product C	\$398,020	\$157,085	\$101,410	\$107,050	\$364,050	\$25,000	\$126,635	\$1,279,250
Software Product D	\$292,250	\$547,500	\$675,000	\$150,000	\$1,725,000	\$150,000	\$150,000	\$3,689,750
Software Product E	\$501,000	\$277,000	\$449,000	\$420,000	\$515,000	\$325,000	\$331,000	\$2,818,000
mean (average)	\$300,204	\$224,042	\$282,357	\$135,410	\$634,060	\$100,000	\$157,477	\$1,833,550
mean(without Product D)	\$302,193	\$143,178	\$184,196	\$131,763	\$361,325	\$87,500	\$159,346	\$1,369,500
median (middle)	\$398,020	\$157,085	\$101,410	\$107,050	\$364,050	\$25,000	\$126,635	\$1,279,250
Software Support and Maintenance								
Software Product A	\$31,000	\$51,300	\$77,550	\$77,550	\$175,050	\$175,050	\$175,050	\$762,550
Software Product B	\$30,950	\$38,375	\$49,400	\$49,400	\$65,150	\$65,150	\$101,100	\$399,525
Software Product C	\$99,505	\$111,021	\$131,303	\$152,713	\$225,523	\$230,523	\$319,813	\$1,270,401
Software Product D	\$58,450	\$167,950	\$302,950	\$332,950	\$345,000	\$677,950	\$737,950	\$2,623,200
Software Product E	\$100,200	\$155,600	\$145,200	\$173,800	\$187,000	\$168,000	\$131,200	\$1,061,000
mean (average)	\$64,021	\$104,849	\$141,281	\$157,283	\$199,545	\$263,335	\$293,023	\$1,223,335
mean(without Product D)	\$65,414	\$89,074	\$100,863	\$113,366	\$163,181	\$159,681	\$181,791	\$873,369
median (middle)	\$99,505	\$111,021	\$131,303	\$152,713	\$225,523	\$230,523	\$319,813	\$1,270,401
Personal Services								
Software Product A	\$159,540	\$50,000	\$50,000	\$50,000	\$50,000	\$59,060	\$50,000	\$468,600
Software Product B	\$179,875	\$50,000	\$50,000	\$50,000	\$50,000	\$65,000	\$65,000	\$509,875
Software Product C	\$136,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$436,000
Software Product D	\$182,200	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$482,200
Software Product E	\$117,200	\$10,000	\$40,000	\$40,000	\$40,000	\$49,000	\$40,000	\$336,200
mean (average)	\$154,963	\$42,000	\$48,000	\$48,000	\$48,000	\$54,612	\$51,000	\$446,575
mean(without Product D)	\$148,154	\$40,000	\$47,500	\$47,500	\$47,500	\$55,765	\$51,250	\$437,669
median (middle)	\$136,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$436,000

Washington State Digital Archives Investment Plan

Year	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	Total Software
Personal Services								
Software Product A	\$159,540	\$50,000	\$50,000	\$50,000	\$50,000	\$59,060	\$50,000	\$468,600
Software Product B	\$179,875	\$50,000	\$50,000	\$50,000	\$50,000	\$65,000	\$65,000	\$509,875
Software Product C	\$136,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$436,000
Software Product D	\$182,200	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$482,200
Software Product E	\$117,200	\$10,000	\$40,000	\$40,000	\$40,000	\$49,000	\$40,000	\$336,200
mean (average)	\$154,963	\$42,000	\$48,000	\$48,000	\$48,000	\$54,612	\$51,000	\$446,575
mean(without Product D)	\$148,154	\$40,000	\$47,500	\$47,500	\$47,500	\$55,765	\$51,250	\$437,669
median (middle)	\$136,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$436,000
Training								
Software Product A	\$12,000	\$0	\$0	\$10,000	\$0	\$0	\$10,000	\$32,000
Software Product B	\$8,000	\$0	\$0	\$10,000	\$0	\$0	\$10,000	\$28,000
Software Product C	\$12,000	\$0	\$0	\$10,000	\$0	\$0	\$10,000	\$32,000
Software Product D	\$8,000	\$0	\$0	\$10,000	\$0	\$0	\$10,000	\$28,000
Software Product E	\$8,000	\$0	\$0	\$10,000	\$0	\$0	\$10,000	\$28,000
mean (average)	\$9,600	\$0	\$0	\$10,000	\$0	\$0	\$10,000	\$29,600
mean(without Product D)	\$10,000	\$0	\$0	\$10,000	\$0	\$0	\$10,000	\$30,000
median (middle)	8,000	0	0	10,000	0	0	10,000	\$28,000

Legacy System Conversion Cost Estimate Detail

Costs by Component	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Media Server	\$8,890	\$0	\$0	\$0	\$0	\$0	\$0
Additional Drives	\$11,575	\$10,000	\$5,000	\$5,000	\$5,000	\$0	\$0
Extraction Software	\$0	\$2,500	\$2,500	\$2,500	\$1,000	\$0	\$0
Conversion Software	\$5,000	\$2,500	\$2,500	\$2,500	\$1,000	\$0	\$0
Image Conversion Services	\$42,000	\$84,000	\$84,000	\$84,000	\$42,000	\$21,000	\$10,500
Document Conversion Services	\$20,000	\$40,000	\$40,000	\$40,000	\$20,000	\$10,000	\$10,000
Miscellaneous Conversion Services	\$5,000	\$10,000	\$10,000	\$10,000	\$5,000	\$2,500	\$2,500
Maintenance on WH and SW	\$4,584	\$7,284	\$9,084	\$10,884	\$12,144	\$12,144	\$12,144
Total	\$97,049	\$156,284	\$153,084	\$154,884	\$86,144	\$45,644	\$35,144

Costs by Budget Category	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Hardware Maintenance	\$3,684	\$5,484	\$6,384	\$7,284	\$8,184	\$8,184	\$8,184
Software Maintenance	\$900	\$1,800	\$2,700	\$3,600	\$3,960	\$3,960	\$3,960
Purchased Services	\$67,000	\$134,000	\$134,000	\$134,000	\$67,000	\$33,500	\$23,000
Hardware Purchase	\$20,465	\$10,000	\$5,000	\$5,000	\$5,000	\$0	\$0
Software Purchase	\$5,000	\$5,000	\$5,000	\$5,000	\$2,000	\$0	\$0
Total	\$97,049	\$156,284	\$153,084	\$154,884	\$86,144	\$45,644	\$35,144

Notes:

Image conversion costs are based on an average of \$ 0.21 per converted image. Thus, Year 1 assumes 200,000 images converted at a cost of \$42,000, Year two 400,000 images at a cost of \$84,000, etc.
 Assumes image conversion to TIFF.

Document conversion costs are based on an average of \$2.00 per converted page. Thus, Year 1 assumes 10,000 pages converted at a cost of \$20,000, Year 2 20,000 pages at a cost of \$40,000, etc.
 Assumes document conversion to XML-encoded text files.

Rationale for Cost Estimates: Phased Implementation

Hardware and Related Costs

The phased hardware acquisition architecture is based on recommendations from the consultants on the minimum requirements for a scalable enterprise-level infrastructure that will maintain expandability throughout the entire growth process of the Digital Archives. Through careful monitoring of the system resources, hardware will be added once demand on the system passes a certain threshold. Additional capacity will be added in direct proportion to agencies connected to the Digital Archives and as funding for expansion is available. To that end, the initial architecture will be comprised of: a 3 TB enterprise-level storage array; dual redundant fibre channel switches; a automated tape library and software for data backup; servers for the content management, database, Internet, email archiving and backup. Each proceeding year, storage availability and computing power and capacity requirements will be increased based on the anticipated agencies planned to be connected to the Digital Archives in the coming year. Prices for the equipment are according to those quoted under the state master contract, when available. For those items not available under master contract, prices used are those developed by the consultant for FY 2003-2008. Storage hardware costs were reduced 5% from current prices in FY 2009, 7% from current prices in FY 2010, and 10% from current prices FY 2011 to reflect an assumption of future, cheaper storage prices.

Year two will add:

- 2TB to the enterprise storage array for added capacity as additional agencies are brought on board
- 3.6TB to a secondary ATA disc array for less expensive storage of infrequently accessed records
- one additional CPU and 1GB RAM to each existing servers to better handle increasing resource utilization

Year three will add:

- 2TB of enterprise storage
- 5TB of ATA storage
- An additional load balancing server for the database
- A test server to replicate the content management environment for continued development of the system outside of the production environment
- One CPU and 1GB RAM for existing servers.

Year four will add:

- 4TB of enterprise storage
- 5TB of ATA storage
- SAN Management software to optimize the storage environment
- Server for SAN management utilities

Year five will add:

- 4TB of enterprise storage
- 8.5TB of ATA storage
- technology refresh on the dual fibre channel switches
- technology refresh on content management, database, email archiving, and backup servers
- additional tape drives for automated tape backup system for decreased backup time on larger storage environment

Year six will add:

- 6TB of enterprise storage
- 8.5TB of ATA storage
- additional fibre channel switch to add capacity for additional storage
- one CPU and 1GB RAM for existing servers

Year seven will add:

- 8TB of enterprise storage
- 15TB of ATA storage
- additional tape drives for automated tape backup system
- additional servers for load balancing

Software and Related Costs

The content management software implementation using a phased approach operates under the philosophy of purchasing the minimum number of concurrent licenses required. In order to function effectively with a smaller number of licenses, concurrent contributor usage of the system will be actively monitored and each contributor will have a carefully planned ‘window’ of time usage assigned to them. Data dumps will be automated throughout the night to the extent that it is possible. All servers have XML conversion capability and the metadata indexing will be automated to the greatest extent possible. Email archiving will be configured from the start, with additional key policy makers identified yearly and their emails brought into the Digital Archives. Year one initial configuration has 10 concurrent contributor seats, a minimum of 1000 web viewer seats (used for price comparison on those software packages which charge for web viewers) and 500 email accounts identified for archival preservation. The cost figures are based on the average of five major content management software vendors.

Year two will add:

- 40 concurrent contributors to handle increased number of contributors from new agencies/departments
- 1000 concurrent web viewers will allow more public/external read-only access to the electronic records
- 500 email accounts will allow for the archiving of additional, identified policy makers from state and local agencies

Year three will add:

- 100 concurrent contributors
- 1000 concurrent web viewers
- 1000 email accounts
- one load balancing server for the content management software to better handle increased demand on system capacity

Year four will add:

- 1000 concurrent web viewers
- 1000 email accounts

Year five will add:

- 350 concurrent contributor
- 1000 email accounts
- 5000 concurrent web viewers

Year six will add:

- 1000 email accounts
- Unlimited concurrent web viewers, if possible

Year seven will add:

- 1000 email accounts
- two additional load balancing content management servers
- one additional test server

Legacy Conversion Costs

The pricing for the legacy electronic records conversion is based on the current cost of the MediaServer by Shaffstall. As this is a very elite, specific market, no other vendors have currently been identified which produce a similar product. The MediaServer will allow up to 28 drives of different media types to be installed, with appropriate conversion software to operate the hardware and decode, then translate the electronic records. As obsolete media that contains records of archival nature, additional drives and appropriate software will be purchased to allow the migration of the electronic records to the Digital Archives. Prices are based on a current quote received by the consultant.

Quality Assurance

This estimate for an outside quality assurance (QA) contractor assumes the need for QA through Phase II of the project, with an estimated duration of 18 months. The estimate is based on the rough proration of two external QA contracts entered into by other state agencies, one costing \$90,000 for 15 months, the other \$96,000 for 12 months.

Discussion of Benefits

The cost benefit analysis forms do not reflect any dollar benefits for the Digital Archives project. Their exclusion does not mean that there aren't any financial benefits. Rather, their exclusion reflects the fact that many of the benefits cannot be accurately projected and would potentially be misleading, if a projection was attempted. Other benefits are intangible and not quantifiable in terms of dollars.

The agency evaluated potential benefits in four categories, as shown below. Following the table, a description of each category is provided.

TABLE OF BENEFITS

Cost Savings	Cost Avoidance	Cost Recovery	Intangible Benefits
	Legal fines and sanctions	Copies of certified records	Improved public access
	Growth in storage facilities for paper records	State recoveries from lawsuits and settlements (e.g. Tobacco settlement)	Legal compliance
			Public trust in government
			Preservation of state history
			Staff efficiency
			Improved record security

Cost Savings

Cost savings was defined as funds *currently* being expended by the agency that will no longer need to be expended once the project is up and running. No cost savings are projected.

Cost Avoidance

Legal Fines and Sanctions

The state can face legal fines and sanctions if the event of:

- failure to retain records that are required to be retained in accordance with the state records retention requirements, or
- failure to produce public documents requested, in a timely manner, in the course of a public disclosure request or in litigation.

This issue is discussed in more detail in Section 2.4, of the Washington State Digital Archives Feasibility Study, Statutory and Legal Requirements. The absence of an organized system of records management – including electronic records – can cost agencies substantial amounts of money. If an agency cannot find their records when they need them, the time and money spent looking for them is a cost. If the state does not provide a record to a requester because it cannot be found, the agency could face monetary sanctions under the Public Disclosure Act or in litigation.

For the purposes of state public records laws, it doesn't matter whether records are in an electronic form or not. The Digital Archives will serve the purpose of providing state agencies with an organized way of storing electronic records that otherwise run the risk of being lost in various ways, including technological migration, inconsistent systems of organization and retention, and others.

Growth in Storage Facilities for Paper Records

Governments are far from the paperless operations predicted in earlier years, even in the face of technological developments. Despite continuing exponential growth in the creation of *electronic* records, there will be a continuing need to properly store and retain paper records as well. In fact, there is some evidence to support the notion that with the technologies available, agencies are creating more paper than ever before! However, it is hoped that over time the required growth in storage facilities for paper records will begin to diminish, with a corresponding increase in electronic storage. The Washington State Digital Archives should facilitate such a trend for Washington State.

Between 1987 and 2001, the Division of Archives and Records Management has constructed new or expanded facilities to house paper records at an average cost for any 10-year period of \$17 million:

- The new Eastern Regional Archives and Washington State Digital Archives facility is currently being built for approximately \$13 million and is expected to open in the spring of 2004 (the first floor devoted to the regional “paper” archives).
- The state Records Center is currently being expanded.
- The agency’s ten-year capital plan also addresses the need to possibly move the Southwest Washington “branch” out of the central Archives building in downtown Olympia to a separately constructed facility somewhere in southwest Washington.
- The central Archives is currently full and an expansion or new facility combining the Archives and the State Library is in the early planning stages.

As a result, the agency is not projecting any short term cost avoidance for physical storage facilities; a slowing in the need to construct new facilities for paper record storage, however, might be anticipated in the future.

Cost Recovery

Copies of Certified Records

The archives has a fee structure that allows recovery of costs to produce copies of records in our collection. An initial estimate for the digital archives, based on historical trends from this cost recovery stream among all branches of the division, is \$12,000 per year. It is anticipated that this may increase over time as more data becomes available electronically. Records series such as maps are in high demand, but their large size and the fragile condition of the paper originals precludes the provision of copies. Once these maps are scanned in and become available in digital format, demand for full-size copies will likely increase the cost recovery revenue.

State Recoveries from Lawsuits and Settlements

Government agencies also stand to gain from lawsuits and settlements. Starting in 1996, Washington joined several other states in a suit filed against the tobacco companies, alleging illegal targeting and marketing to minors and violating Washington's consumer protection and antitrust laws. This suit resulted in a settlement for Washington State of approximately \$4.5 billion through 2025 to help rectify the harm caused by tobacco. The total tobacco settlement is the largest financial recovery in legal history.

This financial recovery, benefiting the citizens of Washington State, was won in part through the ability to recover and produce records. As described in a white paper by Jeffrey Bean from the Washington State Attorney General's office (June 8, 1999) many of the documents required by the Attorney General's office were "aged and ripened well beyond their retention period – many from the 1950s, some from the 1940s, and some even earlier." Much of the documentation was obtained through the Division of Archives and Records Management. A well organized records management system, for records in *any* format, improves the ability to produce documentation and evidence that can ultimately result in a legal settlement.

Intangible Benefits

Most of the immediate benefits resulting from the Digital Archives fall into this category, but are no less important.

Improved Public Access

One of the functions of the Digital Archives will be to serve as a centralized repository for the state's archival and historical records. Government agencies, researchers and other citizens will no longer be required to contact individual agencies to access information. State and local researchers and the general public will benefit from a centrally accessible point to search for government records, and geographically dispersed users will have remote access to the data 7 days a

week, 24 hours a day. This will reduce the public's cost in time, travel, parking, etc. The inventory will be searchable through use of metadata associated with the records, facilitating ease of searching by source, date, author, agency, subject, and other key descriptors.

Legal Compliance

Section 2.4 of the Washington State Digital Archives Feasibility Study, Statutory and Legal Requirements, describes the legal issues surrounding the retention of electronic records. The Secretary of State's Division of Archives and Records Management is mandated by statute to insure the proper management and safeguarding of public records and facilitating citizen and government accessibility. This program will allow the archives to fulfill this mandate by providing the means to safeguard, and provide access to, electronic records – a function we are currently unable to perform. Further, all state and local government agencies have a legal obligation to establish and follow records retention schedules for all records regardless of format. This program will help ensure that agencies meet that obligation by providing reliable, persistent methods to capture, identify, index, store and retrieve digital records for their statutory retention periods.

Public Trust in Government

When public documents and records are difficult to access, the public's trust in government diminishes. Conversely, greater accessibility and availability of government records and documents can increase that trust.

Preservation of State History

Significant amounts of critical electronic data have already been lost. The primary purpose of the Digital Archives is to preserve and provide access to records of enduring legal and historical significance. As government records are increasingly generated and stored in computer-based information systems, the state faces the challenge of managing and preserving these digital documents. Many are critical to the survival of Washington's history and culture, captured in the day-to-day business of government.

Improved Record Security

In a distributed environment such as we have today, agencies are often unable to identify archival data due to the large volume of electronic records. As a result, records of enduring value are often deleted, overlooked, or cannot be located. The digital archives will provide the ability to clearly identify and accumulate in one centralized location records of long-term archival value and the ability to universally apply mandated security to those records.

Staff Efficiency

Because of the lack of reliable methods for capturing, maintaining, and providing long-term access to archival data in electronic form, staff resources are often utilized to manage both a printed "hard copy" of the record along with the

electronic data. While this process helps ensure the availability of critical records, it drives up the cost of storing managing, researching and retrieving the documents. The centralized nature of the Digital Archives along with the ability to clearly identify archival records, will result in increased efficiency in staff resource utilization for management of that data.

V.e. Acquisition Method and Schedule

The Digital Archives project plans to utilize a combination of acquisition methods, as described below, for the various components of the technology solution.

1. Enterprise Disk and ATA Disk Subsystem

The enterprise disk storage component will be the first to be procured. The ATA disk subsystem will not be procured until Year 2. For both, the agency plans to use a Request for Proposal (RFP) competitive process. Only a very few vendors are currently on the DIS Master Contract list. There are a multitude of vendor options, with new technologies becoming available all the time. The agency will need to ensure compatibility with the intended back up solution software (Veritas), the host operating system environment (Windows) and the SAN fabric. The agency's consultant, GlassHouse Technologies, also highly recommended a competitive RFP process in order to obtain the highest level of functionality for the best possible price. Vendors that will be included in the RFP solicitation include, but are not limited to: EMC, IBM, Fujitsu, Dell, Hewlett Packard and others as identified.

2. Host systems, Tape Library and Drives, SAN Fabric

This will be the second major component to be procured. The agency plans to utilize the DIS Master Contracts for this procurement. These Master Contracts represent pre-negotiated discounts on proven products and technologies. The agency will compare the products and pricing from among those vendors covered by a DIS Master Contract prior to making a selection. One key factor will be ensuring compatibility with the enterprise disk and ATA disk subsystem selected.

3. Backup Software

The agency plans to utilize the Veritas product. Veritas is the Secretary of State agency-wide defacto standard and in-house expertise therefore exists already. However, because there are many resellers of this product, a Request for Quotation for procuring the backup software will be used to procure this targeted product at the best price.

4. Content Management Software

This will be the last of the major components to be procured. The agency plans to procure the software utilizing a Request for Proposal (RFP) competitive process. Content management software is not currently available through a DIS Master Contract. There are a wide range of options available, and several products that will meet all or most of the specifications. New products continue to emerge as this is a rapidly growing and expanding market. Specifications will include

compatibility with a Windows operating environment, SQL server database and the Veritas backup software. Vendor offerings that will receive the solicitation include, but are not limited to: Stellent, Interwoven, Relativity, Filenet, Hummingbird, FileNet, Gauss Enterprise, Hyland Software, IBM, Identitech, iManage, OIT, Open Text, Optika, OTG, Tower Technologies, and others as identified.

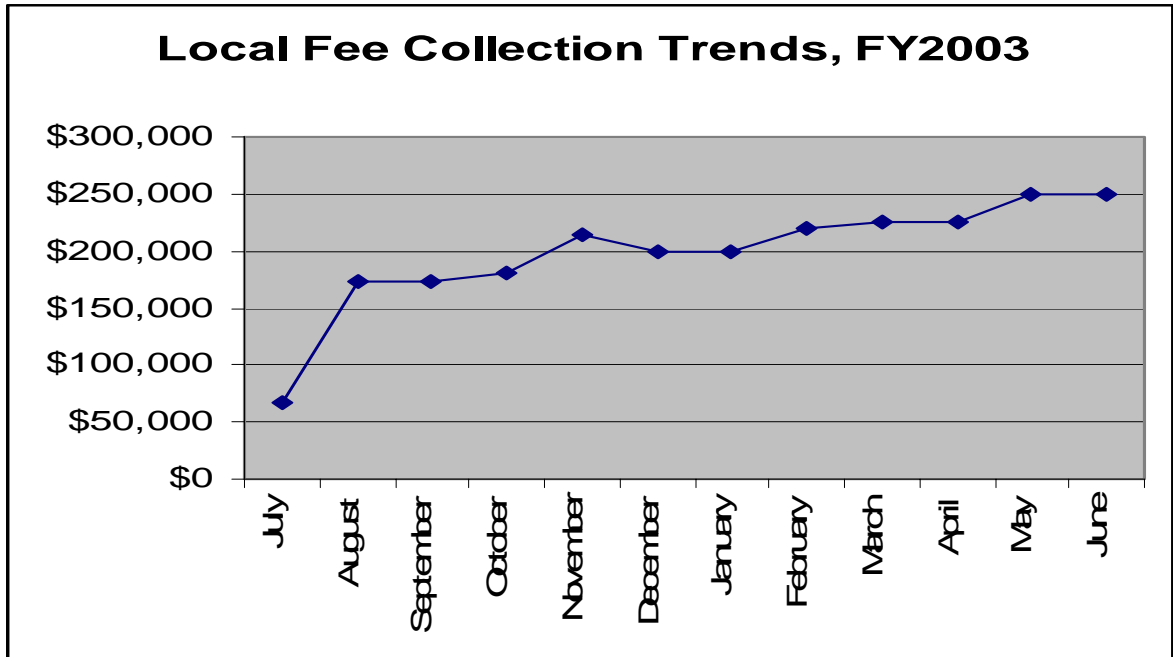
V.f. Financing Plan for the Digital Archives

Source of Revenue

The Division of Archives and Records Management is funded primarily through a combination of two existing revenue sources:

- Revolving fund charges to state agencies based on FTEs and the number of boxes at the state Records Center
- Local fee revenues

One portion of the local fee revenue is a one dollar surcharge on every document recorded at county auditor offices which is transmitted monthly to the state treasurer for deposit into the Local Government Archives Account. This revenue stream, initiated January 1, 2002, is a dedicated revenue stream that requires appropriation authority from the Legislature. RCW 36.22.175 authorizing this revenue stream states that it is “to be used exclusively for the construction and improvement of a specialized regional facility located in eastern Washington designed to serve the archives, records management, and digital data management needs of local government.” It also states that “At such time that all debt service from construction on such facility has been paid, fifty percent of the surcharge authorized by this subsection shall be reverted to the centennial document preservation and modernization account as prescribed in RCW 36.22.170 ...”.



As of July 1, 2003, the fund balance from this dedicated local revenue stream was approximately \$2.1 million. The estimated revenue collection for the 03-05

Biennium is \$3,600,000 -- a conservative estimate, given current trends. Adding the current balance (as of July 1, 2003) and the estimated revenue for 2003-2005 would make \$5.7 million available from this revenue stream for expenditure during the 2003-2005 Biennium. Of that total, \$1,769,267 is pledged to make COP payments on the construction of the facility leaving estimated revenue of approximately \$4 million from this dedicated revenue stream available for use in 2003-2005.

Revenue from a surcharge on recorded documents can be volatile from year to year since the volume fluctuates according to the real estate market activity. In periods of low interest rates, volumes increase dramatically due to large numbers of refinancing transactions. However, the trend in recordings state-wide is a yearly growth rate of 5 – 10% so over time this source of revenue will continue to increase. For purposes of this plan, however, a conservative estimate of 5% annual growth is used.

Financing Plan for the Technology Investment

- Start up costs

Following ISB approval of this Investment Plan in September 2003, the agency will submit an Unanticipated Receipt to the Office of Financial Management requesting additional expenditure authority from the Local Government Archives Account, using some of the currently unobligated balance from this dedicated revenue source. With additional appropriation authority, the agency will take out a four-year term COP to finance the entire amount of the initial technology investment (estimated at \$2,577,568, reflected as 2003-2005 in the Cost Flow Analysis Section V.d.). Payments on this COP are estimated at approximately \$600,000 per year. With approval of the Unanticipated Receipt, the agency can begin the procurement process by the end of October, 2003 and have time to acquire, install and test the hardware and software by the time the facility opens in the spring of 2004.

- Ongoing costs

The ongoing funds needed for upgrade, maintenance and replacement of the technology (“Year 2” and beyond) will be covered through the agency’s operating budget for the Digital Archives.

Financing Plan for the Facility

In the 2001-2003 biennium, the legislature authorized the agency to enter into a financing agreement with the Treasurer (Certificate of Participation) for the construction of a two-story, 48,000 sq. ft. facility that will house both a new Eastern Washington Regional Archives and the Digital Archives. The facility is being constructed on a 2-acre site in Cheney, WA on property belonging to

Eastern Washington University. The Digital Archives portion of the facility will operate on the second floor. The facility is expected to be completed in the spring of 2004.

In December 2002 the agency signed a Certificate of Participation for \$12,870,000 on a 15-year term. The payments on the COP are included in the agency's existing operating budget and are made using the combination of state revolving fund revenue and local fee revenue. There are some projected and unanticipated cost overruns that will need to be covered outside of the COP (unsuitable soil conditions and building code changes) estimated at \$475,000. These are one-time expenses and will be covered by local fee revenue through the Unanticipated Receipt process in FY2004.

Financing Plan for Ongoing Operations

Ongoing operating costs for the Digital Archives will be funded using a combination of state revolving fund charges (40%) and the locally collected fee (60%) discussed above. This funding split will be used during the development phase of the project. However, the split will be adjusted over time, as needed, based on the actual split of state vs. local government records accessioned into the Digital Archives.

Local Fee Revenue

As shown in Exhibit F, the local fee revenue is projected to be adequate to fund the 60% ascribed portion of the costs, in addition to covering 100% of the initial technology costs, the one-time unanticipated construction costs, and the local fee portion of the COP for the facility.

State Revolving Fund

The current state revolving fund revenue is insufficient for both the current (2003-2005) and ongoing costs for the Digital Archives, at 40% of the funding level needed.

The original Digital Archives budget was developed in the summer of 2000. Subsequently, the agency realized that several of the estimates including the staffing levels—were woefully inadequate. Success of this initiative requires staff members at a level that ensures they have the knowledge, skills and abilities to manage the technical and managerial aspects of this program. A decision package was submitted as part of the agency's 2003-2005 biennial operating budget request to increase both the size and the classification levels of the staffing required to operate the Digital Archives. The Office of Financial Management did not include this request in the Governor's Budget Request preferring to wait until the Digital Archives Feasibility Study was completed and the staffing needs were confirmed. In the meantime, updated cost information has been obtained for some of the other areas, revealing other under-projections (e.g. building maintenance/utilities that could not be adequately projected by EWU until the

building design was complete; fiber optic connection that could not accurately be projected until the technology planning was complete). Finally, no funds are included in the current funding level for the ongoing technology maintenance and replacement.

To meet the additional operating costs, the agency will submit a decision package in the 2004 Supplemental Budget Request for the current biennium shortfall, and will submit subsequent decision packages in future biennia to meet the required funding level.

Exhibit F
Financing Plan
Comparison of Local Fee Revenue Estimates to Expenditure Estimates

	07/01/2003 Balances	2003-2005 Estimate	2005-2007 Estimate	2007-2009 Estimate	2009-2011 Estimate
Local Fee Revenue Estimates*					
REVENUE COLLECTED DURING BIENNIUM	\$2,137,597	\$3,600,000	\$3,874,000	\$4,271,636	\$4,709,478
CARRY FORWARD FROM PREVIOUS BIENNIUM	\$0	\$2,137,597	\$2,500,702	\$1,666,366	\$1,191,379
TOTAL REVENUE AVAILABLE	\$2,137,597	\$5,737,597	\$6,374,702	\$5,792,976	\$5,592,053
Expenditure Estimates					
Initial Digital Archives Technology Investment COP payment		-\$600,000	-\$1,200,000	-\$600,000	\$0
Subsequent Digital Archives Technology upgrade, maintenance and replacement (60% of total projected)		\$0	-\$1,101,190	-\$1,751,349	-\$1,702,458
Facility construction COP payment (local fee portion only; entire facility both Eastern Regional and Digital Archives)		-\$1,598,048	-\$1,604,558	-\$1,592,686	-\$1,594,744
Unanticipated construction costs		-\$475,000	\$0	\$0	\$0
Remaining Digital Archives operating budget costs (60% of total projected)		-\$563,847	-\$802,588	-\$802,588	-\$802,588
Balance remaining to carry forward		\$2,500,702	\$1,666,366	\$1,191,379	\$1,801,067

*Assumes 5% annual growth rate from 2003-2005 level

