

NATIONAL CENTER FOR STATE COURTS

**NORTH DAKOTA
ENHANCED RECORDS
MANAGEMENT SYSTEM**

FINAL REPORT

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TABLE OF CONTENTS

	Page
Executive Summary.....	i
Foundation.....	1
Other Considerations	2
Case Management Systems and Network Infrastructure Supporting the Unified Judicial Branch.....	3
Need for an Enhanced Records Management System.....	5
Benefits of an Enhanced Records Management System	8
The Case for an Enhanced Records Management System in North Dakota	9
Optimal Solution– Enhanced Records Management System.....	13
Standards	16
Functional Requirements for an Enhanced Records Management System.....	18
General Technology Requirements for an Enhanced Records Management System	22
Management Requirements for an Enhanced Records Management System	24
Business Process Re-engineering	27
Pilot Program	29
Implementation Plan for Pilot Program	34
Extending the Pilot Program to Other Casetypes and Courts.....	37
Hardware Requirements	38
Implementation of an Enhanced Records Management System	41

APPENDICES

Appendix A–List of Technology Vendors

Appendix B–Estimated Costs for Components Necessary for the Pilot Program

Appendix C–Logical Representation of the ERMS

Appendix D–Logical Representation of the Phased Implementation of the ERMS

Appendix E–Enhanced Records Management System

- Cost Estimate ERMS

- System Design-ERMS System

- Estimated Storage Requirements

EXECUTIVE SUMMARY

The state of North Dakota through its Office of State Court Administrator (SCAO) contracted with the National Center for State Courts (NCSC) to perform a needs assessment identifying requirements for an enhanced records management system to support the Unified Judicial Branch. NCSC was to make recommendations as to architecture, integration with current case management systems, required functionality within the enhanced records management system, and implementation scenarios and phases. In addition, NCSC was to suggest process improvements that would leverage the use of the enhanced records management system for Unified Judicial Branch users as well as its justice partners and the public.

An enhanced records management system for the Unified Judicial Branch is intended to preserve court information, promote greater accessibility to that information, and reduce operational and records storage costs within the Branch. Implementation of a system including e-filing and e-noticing and utilizing e-commerce tools could result in operational savings of \$536,623 if the system were implemented in the 10 North Dakota counties having the largest number of civil filings.

Functional requirements for the enhanced records management system focus on the creation and support of an electronic case file, its management by the court case management system, and the portability of and access to the electronic case file. Technical requirements support current strategies of the Branch's information technology recommending open systems, structured security levels, and highlight scanner resolution as the primary key to system usability. In addition, the suggested solution—utilizing messaging middleware to facilitate the flow of information between the case management system component and the document management system component of the enhanced records management system—allows for the replacement of the case management system component without requiring modification of the document management system component. Messaging middleware acts as a bridge.

The optimal solution includes acceptance of electronic images created through word processing software, facsimile, or electronic documents (such as electronic citations) as well as paper documents, their management through entry into the register of actions in the case management system, and the subsequent receipt of index data once the image is accepted and stored. It utilizes the electronic case file in place of the hard copy case file for clerical processing, judicial consideration, court proceedings, and compliance with court orders. The enhanced records management system begins first with the addition of imaging to current business processes and the replacement of the hard copy case file with the electronic case file for court users. This use can then be extended to the court's institutional partners. Upon introduction of electronic citations within the law enforcement community, the enhanced records management system can accept an upload of that data. The court never uses a paper citation because one does not exist. The last phase is the establishment of electronic filing with the court's institutional partners and then extending participation to the bar throughout the state. At any time, access can be extended outside the court and its institutional partners to the public via the Internet.

However, before the development and implementation of an enhanced records management system, the Unified Judicial Branch should begin the imaging of paper documents for specified cases in several pilot courts. This allows for the testing of equipment and infrastructure, permits needed process modifications without disrupting courts throughout the state simultaneously, and allows technologists and users to explore and adjust their goals and expectations as well as test the technology comprising the first phase of the enhanced records management system. Even if the decision is not to pursue a full service enhanced records management system including e-filing, e-noticing, e-commerce, and electronic monitoring and modification of workflow, the Unified Judicial Branch will have created the necessary infrastructure and systems to support integrated imaging and case management as well as increased portability of and access to its information.

The State of North Dakota through its Office of State Court Administrator (SCAO) contracted with the National Center for State Courts (NCSC) to perform a needs assessment identifying requirements for an enhanced records management system to support the Unified Judicial Branch. NCSC was to make recommendations as to architecture, integration with current case management systems, required functionality within the enhanced records management system, and implementation scenarios and phases. In addition, NCSC was to suggest process improvements that would leverage the use of the enhanced records management system for Unified Judicial Branch users as well as its justice partners and the public.

Foundation

The foundation of NCSC's work for the Unified Judicial Branch is to support the Branch's mission as expressed in its mission statement: **To resolve disputes with justice and efficiency.** In addition, our work expresses the values articulated by the Trial Court Performance Standards. The Trial Court Performance Standards promote access to justice, expedition and timeliness, equality, fairness, and integrity, independence and accountability, and public trust and confidence. These values inform solutions suggested for an enhanced records management system that will support the North Dakota Unified Judicial Branch.

The goals of an enhanced records management system as articulated through facilitated discussions with various members of North Dakota's court and court technology community include preserving the court system's information asset, extending and easing its use within the court community and throughout the justice partnership as well as more effectively serving the public, and ultimately reducing the costs associated with records storage. A primary asset of the court system, in addition to its people, is the information that is created throughout court proceedings. This information provides both an historical context for understanding the court's work and stands as the official record of matters before the court. Because we are a country grounded in the rule of law, this information

must be accurate, accessible, and preserved for future generations. In addition, the Unified Judicial Branch seeks to make its information more available to its partners and the public, enhancing the quality of its service, and responding more efficiently and effectively to requests. An enhanced records management system will permit the automated query of court cases including images of the actual pleadings filed. The Unified Judicial Branch is also concerned with the ever-increasing costs for storage of paper records and is seeking ways to reverse this trend. It is only by reducing the amount of paper retained by the Unified Judicial Branch that this goal can be met. In the past, paper records have been routinely filmed and transferred to either microfilm or microfiche. While this process has the effect of limiting the amount of paper that must be stored, it does not enhance access. It is also typically done after a case is closed requiring the court to hold on to its paper during the active life of the case and for a certain period of time afterwards. It limits access to the information to those who can access the actual film or fiche. Today's technology allows for a wider and simultaneous distribution of data electronically while permitting the destruction of the paper and even preventing the creation of the paper document itself. However, a major concern is the long-term viability of the technologies replacing film and fiche. This concern must be addressed as a component of the ongoing strategy for technology currency within the Unified Judicial Branch.

North Dakota's Unified Judicial Branch is seeking to fulfill these goals through the specification and implementation of an enhanced records management system to complement and integrate with its case management systems. In addition, the Unified Judicial Branch seeks to make the best use of North Dakota tax dollars for the benefit of all the court system's constituencies.

Other Considerations

North Dakota enjoys the luxury of geographical expansiveness and a widely dispersed population. But with thinly populated, wide-open spaces come the challenges of inclusion and responsiveness. The administration of justice must accommodate the needs and requirements of North Dakota's citizens and be

perceived and experienced by them as efficient and effective. Towards this end, the Unified Judicial Branch maintains a presence in each of the State's fifty-three (53) counties through the Office of the Clerk of Court. A courthouse is located in each county irrespective of whether or not judges are chambered in that county. Cases are taken to disposition in the county in which they were filed. Clerk's offices are located in each county and are currently a mix of state- and county-funding as decided by each county. In some instances, the duties of the Clerk of Court are combined with those of the Register of Deeds and do not require the dedication of a full-time employee. In those instances, the individual acting as clerk of court may also serve the county in other capacities.

Case Management Systems and Network Infrastructure Supporting the Unified Judicial Branch

Case management systems used in North Dakota general jurisdiction, juvenile, and appellate courts are supported by the SCAO. The primary case management system deployed throughout the State is the **Unified Court Information System (UCIS)**. UCIS was originally purchased from Scott County, Minnesota, by Burleigh County. It was then acquired by the SCAO and enhanced and upgraded for use throughout the State's district courts. It has recently been implemented, after undergoing additional upgrades and enhancements, in Cass County. UCIS runs on IBM's proprietary AS/400 platform. Utilizing a relational database, this case management system is designed to fully support North Dakota's general jurisdiction courts providing party, case, and count information from filing through compliance with court-ordered monetary and service sanctions. In addition, selected UCIS data is copied to the **State Court Data Warehouse** and is available to authorized users via this web-based inquiry system. UCIS is the primary access point for case information. Constrained by the AS/400 properties, UCIS is unable to effectively utilize graphics to highlight either significant or conflicting data to assist the user in navigating through the data but it does provide adequate information in the "green screen" format. The **Juvenile Case Management System (JCMS)**, purchased and supported by the SCAO, is used throughout the State's juvenile

courts. JCMS utilizes an Oracle database on a Windows server. The **Supreme Court Docket System (SCDS)** supports case management within the Supreme Court utilizing an MS SQL database, also on a Windows server. The Unified Judicial Branch is connected to the State's network (STAGENET) (managed and supported by Information Technology Department (ITD), an executive branch agency) to provide connectivity throughout the State permitting email, access to the statewide child support data system, administrative systems, and UCIS.

All of the courthouses in North Dakota have a T1 or greater connection to STAGENET. A T1 connection should provide sufficient capacity for implementing an enhanced records management system.¹ However, the network infrastructure within each courthouse varies because individual counties may be responsible for the network inside the courthouse. Due to performance issues encountered when the SCAO implemented a Citrix solution, the SCAO has had the internal network infrastructure upgraded in most courthouses thereby providing the additional bandwidth needed to support document images. In many instances, county information technology staff may support the local area network; executive branch personnel support the statewide communications network; and, Unified Judicial Branch employees support the application. The NCSC project team has concluded that:

- The mix of platforms, systems, and support responsibilities provides specific challenges for the implementation of an enhanced records management system. The most likely case type, given the documents filed, the case life, and the involvement of retained counsel (rather than pro se litigants or government-provided public defenders), with which to pilot the enhanced records management system is civil. Civil cases are supported by UCIS running on the AS/400 closed system (specifications are proprietary to the system's vendor).
- The executive branch currently supports statewide imaging applications through its Information Technology Department and can assist the Unified Judicial Branch in its understanding, design, and implementation of that

¹ A T1 circuit can transmit approximately 3 pages per second. T1 is defined as a 1.544 megabit T-carrier channel that can handle 24 voice or data channels at 64Kbits/sec. The standard T1 frame is 193 bits long, which holds 24 8-bit voice samples and one synchronization bit. 8,000 frames are transmitted per second. Alan Freedman, *the Computer Desktop Encyclopedia*, The Computer Language Company Inc., Point Pleasant, PA, 1996, p.845.

portion of the enhanced records management system that involves document imaging.

Need for an Enhanced Records Management System

The Information Technology Systems Integration and Migration Analysis performed by JUSTICE SERVED™ and published in July 1999 briefly addresses the need for an enhanced records management system through its discussion of electronic filing and document imaging. The definition of electronic filing presented by JUSTICE SERVED™ is

“transmission of case filing data, signatures, documents, and payment of fees (if required) in electronic form from a filing party’s computer to the court’s computer where the information is maintained and distributed in electronic form.”²

Their conclusion is that traffic citations, paternity and child support cases, and misdemeanor DUI cases are the best candidates for conversion to electronic filing.³ In their discussion of document imaging, JUSTICE SERVED™ concluded

“We did not see any areas of court operations in North Dakota that we believed would justify the cost of a document imaging system at this time.”⁴

However, the North Dakota Unified Judicial Branch Information Technology Plan of December 2002 identifies the analysis, integration, and implementation of an enhanced records management system as providing a more effective and efficient method of archiving, storing, and retrieving documents for Unified Judicial Branch employees and the public.⁵ The inclusion of an enhanced records management system in the Unified Judicial Branch’s plan exhibits

² JUSTICE SERVED™, *Information Technology Systems Integration and Migration Analysis*, July 29, 1999 prepared for the North Dakota State Court Administrator’s Office, p.27.

³ JUSTICE SERVED™ identifies the following characteristics as identifying cases appropriate for electronic filing: 1) high volume of cases is filed by one agency; 2) active life span of case is short; 3) the documents themselves are short; 4) documents’ electronic format is ASCII; 5) filing agency has an automated case management system; 6) no filing fees are required; and 7) document retention period is less than 10 years. JUSTICE SERVED™, *Information Technology Systems Integration and Migration Analysis*, July 29, 1999 prepared for the North Dakota State Court Administrator’s Office, p.27.

⁴ JUSTICE SERVED™, *Information Technology Systems Integration and Migration Analysis*, July 29, 1999 prepared for the North Dakota State Court Administrator’s Office, p.30.

⁵ *North Dakota Judicial Branch Information Technology Plan*, December 2002, Version 3.1, p. 13.

recognition of the problems inherent in paper files and the potential benefits of moving information electronically over long distances.

NCSC surveyed representative Unified Judicial Branch staff to find out if the need for an enhanced records management system would be spontaneously articulated. While it was not, the NCSC project team concluded that the lack of response reflected the court employees' current exposures to technology within their workplace today and not the possibilities of technology to support them in the future. It can be very difficult to see the advantages to documents received, archived, accessed, and distributed electronically while immersed in a paper-intensive environment – particularly when additional effort is required to convert the documents to an electronic format. The NCSC project team does agree with the strategic vision of the Unified Judicial Branch and their foresight in recognizing the need for a more efficient and effective approach to records management. We believe that in order to fully realize that vision, the enhanced records management system must go beyond the definition of electronic filing used by JUSTICE SERVED™ and their conclusions concerning document imaging. The NCSC project team's model of an enhanced records management system is one that will integrate case management modules with the document management index and point to a document database comprised of images, electronic images, and electronic documents,⁶ manage the electronic case file folder, and point to and retrieve its contents for electronic display alongside case management system information as well as prepare and route information electronically. It will also create the potential for Internet access via a virtual private network⁷ for authorized users, and possibly, access by the public through a public access portal on the Internet. In addition, it may control the flow of

⁶ For the purposes of this report, the NCSC project team defines images as digitized pictures of hard copy documents to which the enhanced records management system is NOT content-sensitive; electronic images are defined as the digitized pictures received electronically to which the enhanced records management system is NOT content-sensitive; and electronic documents are defined as digital data to which the enhanced records management system IS content-sensitive.

⁷ A virtual private network permits authorized individuals access and use of their network and its applications and data via the Internet as if they were sitting at their desks.

information through the court's business processes so that documents are delivered to court and clerk's office staff electronically.

Because the Unified Judicial Branch is committed to hearing cases in the counties in which they are filed, North Dakota's 42 judges must travel from courthouse to courthouse across its 53 counties. Files must be sent to judges in preparation for hearings and trials and those same files must be available at the actual hearing or trial as well as for prosecutors, defense attorneys, litigators, and the public. Clerk's office employees end up duplicating and re-filing the duplicate copy once a file has been sent to the judge. Implementation of an enhanced records management system, while adding the work of creating the electronic case file folder, converting its contents from paper to a digitized image, and updating the case management system so it will point to the electronic case file⁸, relieves staff from copying, filing, pulling files for the judge, filing once again, and retrieving files for attorneys and the public. Staff will be able to burn a CD⁹ containing a particular judge's docket for a day or week and the judge can then access those electronic case file folders via his or her laptop while on the road or work on them at home without having to access or be directly connected to the court system's network. The electronic case file can be accessed via STAGENET for authorized users outside the Unified Judicial Branch and by the public through public access workstations in the courthouse or via the Internet through a public access portal.

To summarize the need for an electronic records management system:

- The Unified Judicial Branch has identified more effective and efficient records management as a goal.
- The NCSC project team recommends that effective and efficient records management be accomplished through implementation of an enhanced records management system that encompasses electronic filing where appropriate and economical, conversion of paper documents to electronic

⁸ Should the Unified Judicial Branch implement electronic filing processes, much of the work of indexing and creation of the electronic case file folder will be done by the electronic filing application. Integration of the ERMS with the case management system will also permit the case management system to capture pointers and index data automatically.

⁹ Compact disc.

images by scanning, and distribution of information through electronic media both within and outside the courthouse.

Benefits of an Enhanced Records Management System

Given that a case management system (CMS) only stores a minimal amount of data concerning a case and that data is utilized primarily to generate calendars, monitor caseload progress and growth, track payments, and provide a convenient summary of case events and actions, there is a significant amount of information that resides within the documents of the case themselves that is not captured by the CMS. An enhanced records management system (ERMS) that is integrated with the case management system allows access to the facts, context, and content of a case as represented by the electronic case file folder in addition to the details of calendaring, case assignment, case status, and compliance with court-ordered sanctions.

Clerk's office employees spend much of their time receiving, filing, retrieving, and copying paper documents. Activities such as creating files, pulling and filing case jackets, filing new documents in existing case files, maintaining indexing systems, monitoring the location of files, purging files, microfilming documents, and archiving are eliminated or significantly changed with the implementation of an ERMS. The most obvious and immediately realizable benefit to an ERMS is the simultaneous access to data and images by multiple users in the same way that a CMS permits multiple accesses to the same data by many users. The ERMS also removes the barrier of the counter between the court employee and the customer. Through the court network, public access computers, and potentially, the Internet, the customer (whether a judge, other court employee, attorney, or member of the public) can find and review data without requiring the direct assistance of a court or clerk's office employee. Elaborate storage methods utilizing labels (computer-generated and bar coded by the CMS), color-coded or specially constructed file jackets, electric filing cabinets requiring structural flooring, and safe, fireproof, off-site storage units, can be eliminated with the storing of paper still received by the court filed by date. And the paper is

only filed once.¹⁰ In order for a judge to work at home, no longer will he or she have to load his or her car's trunk with case files when only a CD is needed. No longer will the judge have to transport the case files to other courthouses to hear cases. All courts will be able to access the electronic case file folder and display its content in offices, chambers, and the courtroom. In addition, an ERMS paves the way for electronic filing, electronic management and monitoring of work processes, and electronic noticing.

To summarize the benefits of an electronic records management system:

- The ERMS provides the actual verbiage of pleadings and other documents filed with the court.
- No longer will court staff need to check out paper files, duplicate them, create file folders, and locate, pull, and re-file case jackets.
- The ERMS provides simultaneous access to multiple users.
- You no longer need to go to the courthouse to look at a file.

The Case for an Enhanced Records Management System in North Dakota

The answer that everyone wants to hear when considering the adoption of new technologies is that they will save money and time. The realization of these goals is not immediate. Installation and implementation of an ERMS is a major investment and requires a long-term budgetary commitment for the acquisition, maintenance, and upgrade of its underlying technologies. Training is costly as judges and court staff must first learn how the technology works, make and adjust to changes in business processes and workflow, and then become proficient in its use. Cultural barriers to viewing documents electronically instead of handling paper must be overcome. Steps are added to the process of document receipt but electronic case file creation, filing of the physical document itself (should one be received), retrieval, preparation for courtroom activity, and document review become significantly easier and more efficient over time.

Archiving the case for permanent storage can now be done automatically through

¹⁰ Court rules would need to address the issue of the court case file in a case on appeal. Either the court staff would have to reconstruct a paper file in the event or the electronic case file is deemed sufficient for appellate purposes through a change in court rule.

conversion of the electronic case file to microfiche should that remain North Dakota's the archival medium required by statute. Some of the time now spent in shuffling paper can be dedicated to other tasks. Currently, if a paper document is received by the clerk's office, a case file jacket must be created if a new case is initiated; it must be entered in the case management system, and filed in the case file jacket. When additional documents for that case are received, they must be entered in the case management system; the case file jacket must be located and pulled; and the new document filed in the jacket with the jacket then re-filed. When a file is requested, it must be located and pulled. If the judge needs the file before a scheduled event and he or she is not chambered in that county, the case file jacket must be located and pulled; the documents must be checked against the register of actions in the case management system to ensure that all documents are physically filed in the case file jacket; the documents are then copied; and a duplicate case file is created. The original case file jacket is given to the judge and the duplicate case file is re-filed. When a file is archived, it must be located, pulled, the documents checked against the register of actions in the case management system to ensure their completeness, and the documents filmed. The documents are then held while the resulting film or fiche is checked for readability and only then are the documents destroyed. If the electronic case file is deemed to be the original, at archival time, no further action is required because the underlying paper had been destroyed long before.¹¹ If the document is received electronically, it does not require conversion to a digitized format because it is already electronic; only verification and indexing by the clerk is necessary. If the document contains or is accompanied by predefined electronic tags, initiation in the case management system is automatic after acceptance and verification by the clerk.

¹¹ In Miami-Dade Florida, the image of the traffic citation created upon receipt of the paper citation by the clerk's office is the original by court rule. The paper citation itself is held 30 days and then destroyed.

In 1997, the Shawnee County, Kansas, court compared both its manual and electronic workflows.¹² Their findings are summarized in the following table:

Time and Estimated Savings per 100 Documents (Not Cases) Processed

Process	Manual Processing Time in Hours	Electronic Filing Time in Minutes	Staff Time Savings in Hours	Staff Savings @ \$30,000 Salary Plus 30% Benefits
Case filed and fees collected	1.00	5.5 minutes	0.93	\$21.14
Petition checked for completeness	0.75	Included above	0.75	\$17.05
Data entry	3.25	3.3 minutes	3.20	\$72.73
Summons issued	1.00	Included above	1.00	\$22.73
Summons signed	1.25	Included above	1.25	\$28.41
Docket fees rung by cashier	1.00	Automatic	1.00	\$22.73
Receipt mailed to attorney	0.25	Automatic	0.25	\$5.68
Documents filed in case file jacket	1.00	Automatic	1.00	\$22.73
Summons carried to sheriff	0.25	Automatic	0.25	\$5.68
TOTALS	9.75 HOURS	8.8 MINUTES	9.63 HOURS	\$218.86

The enhanced records management system used by the Shawnee County, Kansas, court included not only electronic filing of documents but electronic fee collection, automated data entry to and integration with the case management system, automated document generation and use of electronic signatures, integration with the cash management module of the case management system, and automated routing of electronic receipts and summonses.

An NCSC study of the Maricopa County, Arizona, Superior Court found that it received an average of 19 documents per case. According to the *Arizona Courts Data Report 1996*, 95,619 cases were filed in this court. At 19 documents per case, that equals 1.8 million documents. Applying the formula used by the

¹² <http://www.shawneecourt.org>

Shawnee County, Kansas, court results in a potential savings of more than \$3.9 million for that one year alone.¹³ Although the document and case number assumptions cannot be directly applied to North Dakota, it is obvious that some amount of savings can be realized through the implementation of an enhanced records management system that includes not only the imaging of paper documents but electronic filing, integration with the case management system, automated document generation and routing, and use of electronic funds and accounts. Not taken into account in either the Shawnee County, Kansas, study or the Maricopa County, Arizona, extrapolation are the savings that can be realized through reduction of records storage requirements both within the courthouse and off-site. If the formula was modified to an average of 10 documents per case and only the civil cases in the 10 North Dakota counties having the most volume in the state were participating in an enhanced records management system, the operational savings would potentially be \$536,622.83¹⁴. If we modified the assumptions to apply to traffic filings from electronic citations, we might realize the following savings:

Time and Estimated Savings per 100 Citations Processed

Process	Manual Processing Time in Hours	Electronic Filing Time in Minutes	Staff Time Savings in Hours	Staff Savings @ \$30,000 Salary Plus 30% Benefits
Case filed	1.00	5.5 minutes	0.93	\$21.14
Citation checked for completeness	0.75	Included above	0.75	\$17.05
Data entry	3.25	3.3 minutes	3.20	\$72.73
Documents filed in case file jacket	1.00	Automatic	1.00	\$22.73
TOTALS	6 HOURS	8.8 MINUTES	5.88 HOURS	\$133.65

¹³ James E. McMillan, J. Douglas Walker, and Lawrence P. Webster, *A Guidebook for Electronic Court Filing*, West Group, Inc., 1998, pp. 139-140.

¹⁴ According to 2002 Filings by County for North Dakota, Cass, Grand Forks, Burleigh, Ward, Stutsman, Morton, Ramsey, Richland, Stark, and Williams counties had a total of 24,519 civil filings. At 10 documents per filing, this represents 245,190 documents. Based upon the Shawnee County, Kansas, savings of \$218.86 per 100 documents, this represents \$536,622.83.

For those same 10 counties, this would result in a potential savings of \$74,612.78.¹⁵ If the system were extended statewide, the potential savings for traffic filings could be \$120,911.81.¹⁶ Although the savings in a county with fewer filings may be negligible when viewed in isolation, it is specifically these counties that are most likely not to have a judge chambered in the courthouse and therefore, are more in need of an electronic case file folder. For these counties, the benefit is the portability of the electronic case file folder and its accessibility.

To summarize the case for an electronic records management system:

- The cost of handling a document is reduced once the system is implemented, accepted, and operating.
- Court staff can focus on internal and external customers rather than papers.
- Electronic case file folders are portable, accessible, and small.

Optimal Solution – Enhanced Records Management System

The components of an enhanced records management system include the case management system, electronic filing, scanning capability and capacity, document management software, messaging middleware¹⁷, and potentially,

¹⁵ Again, according to 2002 Filings by County for North Dakota, Cass, Grand Forks, Burleigh, Ward, Stutsman, Morton, Ramsey, Richland, Stark, and Williams counties had a total of 55,827 traffic filings.

¹⁶ The North Dakota Highway Patrol is currently in the process of implementing use of electronic citations.

¹⁷ From <http://www.techweb.com/encyclopedia/defineterm?term=messagingmiddleware>, Messaging middleware is defined as software that provides an interface between applications, allowing them to send data back and forth to each other asynchronously. Data sent by one program can be stored in a queue and then forwarded to the receiving program when it becomes available to process it. Without using a common message transport and queuing system such as this, each application must be responsible for ensuring that the data sent is received properly. Maintaining communications between different types of applications as they are revised and eventually replaced with newer architectures creates an enormous programming burden in the large enterprise. A message broker is either a complete messaging system or software that works with existing messaging transports in order to add routing intelligence and data conversion capabilities. A rules engine analyzes the messages and determines which application should receive them, and a formatting engine converts the data into the structure required by the receiving application. Examples are MQSeries Integrator which extends MQSeries, e-Biz Integrator (successor to MQSeries Integrator) and Rendezvous (see MQSeries Integrator, e-Biz Integrator, TIB/Rendezvous and ActiveWorks). Messaging middleware and email messaging systems provide similar transport functionality. The primary difference is that messaging

workflow management software. The solution envisioned by the NCSC project team consists of access to electronic documents through UCIS (and, potentially, JCMS and SCDS) via messaging middleware that serves as the bridge to the index for the images themselves. The reason we recommend that UCIS only store a link to the actual index data is to permit the replacement of the case management system without requiring either reprogramming or downtime of the document management software. In the specific case of UCIS, we avoid embedding significant information and management of the electronic documents in a closed system. The document management software should create the link and upload it to the case management system via the messaging middleware. The ERMS definition should include electronic filing and permit automated case initiation within the case management system upon verification and acceptance of the filing. It will be necessary to define and specify the data needed to initiate the case in the case management system for electronic filers. Workflow monitoring and management should also be a component of the ERMS and be driven by the document management software. Preparation and distribution of electronic notices through the ERMS is appropriate for institutional customers within the justice partnership (police, sheriff, prosecutor) and those members of the bar having the necessary technological sophistication. The document management software also has the potential to manage the versioning and electronic publishing to the court system's and the State's intranet and the Internet of calendars, opinions (replacing the labor-intensive although effective mechanism currently in place), or other information produced and distributed by the Unified Judicial Branch.

However, the implementation of the optimal ERMS solution without staging or phasing is neither feasible nor recommended. Keeping in mind that crawling comes before walking just as walking comes before running (or should) and, that

middleware deals with transactions between programs, whereas e-mail messaging deals with memos between people.

imaging should be a transitional solution¹⁸ for the court, ERMS must begin with document scanning. The optimal deployment would be to equip each clerk's office throughout the State with scanners¹⁹ allowing for immediate indexing and scanning of documents and their subsequent availability throughout the rest of the court system. To obtain full benefit from digitized images and the labor necessary to produce them, these imaging workstations should also include CD/DVD burners. In order to maximize system use and reduce or eliminate movement of hard copy documents, each courtroom throughout the State should be connected to the network and equipped with computers, high definition monitors, and laser printers usable by the judge, the clerk, and attorneys. Each clerk's office should also be able to copy the electronic case file folder to CD for use outside the court's network by judges and authorized personnel. The hardware, network, and interface with the case management system needed to implement and use an imaging solution are also necessary to implement and use an ERMS. Should it be decided that imaging is the fulfillment of the strategic vision expressed in the Unified Judicial Branch's Information Technology Plan, a significant investment will have been made without taking advantage of the full

¹⁸ The NCSC project team believes imaging to be a transitional solution because of the necessary investment in hardware and network to fully utilize the image while continuing the existing processes of data entry into the case management system, manual workflow management and monitoring, and paper-based noticing, payment, and receipting of filing fees. The same hardware and network are necessary for an ERMS but the benefits to be realized are significantly greater. Unlike other records used primarily for reference (for example, land records, deeds, marriage licenses, birth certificates, or death certificates), court records are not only filed and retrieved but they are sorted, selected, managed, monitored, and added to by the court itself. Document imaging can be viewed as a static rather than a dynamic solution and may be the paper of the future.

¹⁹ Other deployment schema such as centralization within a district are possible; however, clerks will copy a document before the original is sent to central scanning for reference during the scanning process and a delay occurs until the document is available electronically.

potential presented by implementation of electronic filing processes²⁰ within an ERMS. Details of this first phase are provided later in this report.

Standards

There has been a significant effort over the last two years to establish and publish standards that support interoperability between systems. As interconnections become not only more critical but inevitable, standards ease the way towards linkage. Prepared by the Electronic Filing Standards Subcommittee of the National Consortium for State Court Automation Standards, NCSC published *Recommended Standards for Electronic Filing Processes (Technical and Business Approaches)* in February of this year. The recommended standards were published for consideration and review prior to their adoption by the Boards of Directors for the Conference of State Court Administrators (COSCA) and the National Association for Court Management (NACM). Funded by a grant from the State Justice Institute, the recommended standards are a project of the COSCA and NACM Joint Technology Committee. These recommended standards endorse the full service model of electronic filing processes similar to the model recommended by NCSC to the SCAO.

The recommended standards are also intended to provide a “road map” for vendors in their development of electronic filing, case management, and document management products. Other goals of this project include encouraging the movement of the Third Branch from paper to electronic records, and supporting the consistent application of technology standards to insure interoperability of systems at the federal, state, and local levels. These standards address many of the same issues outlined in this report and should be thoroughly reviewed by SCAO management and information technologists as well as judicial leadership for their

²⁰ For the purposes of this report, we are using the phrase “electronic filing processes” as the full service model as defined in the *Standards for Electronic Filing Processes (Technical and Business Approaches)*, a joint project of the Conference of State Court Administrators and the National Association for Court Management Joint Technology Committee and published by the National Center for State Courts, February 26, 2003. This includes not only the transmission of electronic documents into the courts, but also the routine use of electronic documents and the electronic record for case processing, for service on other parties, and for access and use by everyone involved in, or interested in, the case, p. 5.

applicability to North Dakota. The full text of the Standards for Electronic Filing Processes (Technical and Business Approaches) may be found at <http://www.ncsconline.org> following the link to Technology and then to Standards.

Standards are published in both RTF and PDF formats. The direct link to PDF version is

http://www.ncsconline.org/D_Tech/Standards/Documents/pdfdocs/Recommended_Process_standards_02_26_03.pdf.

These recommended standards are particularly important because they address not only the technical and technological aspects of electronic filing processes but outline policy and procedural issues as well.

Requirements

In order to create the enhanced records management system, it is necessary to identify and articulate functional and general technical requirements to assist in the selection or development of appropriate software and the selection of appropriate hardware. Functional requirements are intended to express the business outcome desired through utilization of the system rather than direct the developer as to what and how something should be accomplished. The actual technology solution should be irrelevant as long as it conforms to the parameters defined by the requestor as technical requirements. Technical requirements guide the integration of software and hardware acquisitions with the requestor's current technology. The Unified Judicial Branch utilizes both closed (AS/400) and open (MS SQL, Oracle) system architectures. Newer systems (JCMS and SCDS) have been developed using open system architectures, which represents a distinct change in direction for the Branch's information technology. Components of an enhanced records management system should conform to this new direction. Security tends to be defined by application. The enhanced records management system will consist of several components, including the case management system, and security should be defined to exercise authority over the ERMS components as a unit rather than as separate applications. While management requirements are not a component of a formal Request for Proposal and would not be included in a

solicitation for an ERMS, they are intended to describe some of the activities necessary to implement and foster acceptance and success of the system. No system implementation is without problems but if judges, court administrators, clerks of court, and technologists are able to engage in dialog that addresses potential risk and results in realistic expectations, the implementation will be smoother. The definition of management is purposefully vague because in some instances, the SCAO (supported by the judiciary) must be a leader for such activities as obtaining funds to support training and transition in addition to hardware and software; in others, only judges can provide the necessary leadership to facilitate the acceptance and success of the system through their use of and support for the ERMS. In each clerk's office, the Clerk of Court plays a pivotal role in the rollout of a new system and the attendant modification to business processes and workflow. The management requirements represent a compilation of lessons learned as described by SCAO and court staff and are offered as reminders that the success of a technology project comes about through the joint efforts of all involved in designing and using the technology – technologists, trainers, users, administrators, and judges.

Functional Requirements for an Enhanced Records Management System

The NCSC project team, in collaboration with representative court staff and judges, has identified the following high-level functional requirements for an enhanced records management system. The enhanced records management system should:

1. Facilitate simultaneous multiple accesses to the same image.
COMMENT. *This presumes that all court system workstations have access to the document manager and images.*
2. Permit access to the same image from multiple locations.
COMMENT. *This presumes that the document manager is capable of displaying multiple images of the same document at different workstations.*

3. Reduce (OR with rule and legislative changes – eliminate) hard copy information storage requirements for the Unified Judicial Branch.

COMMENT. *Project staff conducted a brief review of statutes to assess the status that documents scanned into an enhanced records management system will have as compared to paper documents. North Dakota statutes do not give explicit legal status to imaged documents, but do not limit the legal status of imaged documents.²¹*

RECOMMENDATION. *Current North Dakota statute permits the Supreme Court to specify the records management procedures for the court records of the state judicial system.²² The current records management procedures for courts, promulgated by Supreme Court rule, do not forbid the storage of court records in electronic format. However, the records retention schedule contains specific reference to retention of court records in microfilm format and appears to foreclose maintaining document images without retaining the original paper files and/or microfilm.²³ The following rule changes should be considered by the Supreme Court.*

- a. *Rules governing document retention and archiving should discuss goals of retention and archiving and desired characteristics of the archival medium rather than identify the actual medium itself.*
- b. *Rules should authorize acceptance of electronically filed documents; articulate authentication and signature definitions and requirements; define interface requirements; specify methods for payment of filing fees; allow for use of electronic images during court proceedings; and exempt public disclosure of information concerning private keys, asymmetric cryptosystems, or algorithms or other information that would jeopardize the security of the electronic filing component of the ERMS.²⁴*
- c. *Rules should define the status of electronic documents as compared to hard copy records for public access. Rules should also address the issue of cost recovery for public access.*

²¹ Section 54-46-02, NDCC. "... document ... or other material, regardless of physical form or characteristics, made or received pursuant to law or in connection with the transaction of official business."

²² See Article VI, Section 3 of the North Dakota Constitution and Sections 27-02-05.1 and 54-46-06, NDCC.

²³ N.D. Sup. Ct. Admin. R. 19 - Court Records Management Program Section 11.

²⁴ See Leibowitz, Wendy. "Courts Electrify Suits, Sparks Fly; New Rules Needed For E-Filings." *National Law Journal B6*, September 7, 1998.

- d. *Rules should provide for the replacement of traditional books, files, and other records by their electronic equivalent.*
 - e. *Rules should designate the electronic image as the original and any paper reproduction of that image as a certified copy.*
 - f. *Rules should designate how page and length limits for the electronic document are determined and whether or not links to web-based materials or footnotes connected to original references impact those limits.*
 - g. *Rules should provide for the sealing and expungement of electronic records.*
 - h. *Rules should specify who assumes the risk in the event of system failure as well as liabilities and assumptions related to the use of digital signatures. In addition, rules should outline remedies in the event of system failure.*
4. Create a single and complete electronic case file for each case.
COMMENT. *Business processes need to be modified to ensure that all documents associated with a case are included in the case management system's register of actions. This may necessitate the design of different views of the register of actions if it is to include documents that are not officially filed with the court such as correspondence.*
5. Enhance file integrity through integration of the ERMS with the court's case management system. Anticipate document acquisition and storage through integration with the court's case management system.
COMMENT. *Integration reduces retrieval time and provides quality assurance to business processes associated with case initiation.*
6. Permit tracking of anticipated documents through the document workflow processes.
COMMENT. *If the ERMS is used to key the workflow processes involved with court case management, supervisors and managers can monitor and assess work with more accuracy as well as provide for the dynamic redirection of workflow when required.*
7. Serve as the primary access point for and storage of case-related information.
COMMENT. *In order to maximize the advantages of an ERMS, it must be used. If users continue all manual processes in addition to supporting the ERMS, its benefits will not be realized.*
The enhanced records management system will alter the workflow in the courts where it is implemented. The SCAO, along with the clerk of court offices, should carefully consider and identify what

aspects of the workflow will, and should, change. The aspects of the workflow that will change will vary with the scope of the enhanced records management program as well as local practice and procedures. It must be recognized that although the functions in each county's clerk of court's office are the same, the performance of those functions will vary on an office-by-office basis. The SCAO should determine statewide policy and standards and work with each office to reengineer specific workflows to maximize the benefits realized from the enhanced records management system. The workflows most likely to change are records requests, case initiation, filing, and sealed/expunged files. The eventual integration of the enhanced records management system with the mainframe case management system will result in additional significant workflow changes.

8. Accept paper, electronic, and electronically created documents.
COMMENT. *Recognizing that the initial use of the ERMS will be the indexing and imaging of paper documents, it is still necessary to allow for other types of documents.*
9. Eliminate movement of paper documents from the clerk's office.
10. Promote the use of electronic filing and electronic noticing.
11. Reduce waste through print on demand functionality.
12. Allow for designation of user-defined security at the document and electronic case file levels.
13. Permit the sealing or expungement of case files or individual documents as ordered by the court.
14. Conform the display and sequencing of documents to case management system-controlled views for case-based information.
15. Utilize the court's case management system as the ERMS access point for case-based information and permit direct access for administrative reports built from case-based information to authorized users.
16. Allow for the storage and retrieval of electronically created non-case related documents that mimic paper documents or printed reports.
17. Allow for selective by-pass of the court's case management system for the storage and distribution of administrative point-in-time reports built from case-based information by authorized users.
18. Archive directly to permanent storage medium.

COMMENT. *It is of prime importance that there be long-term access to and usability of images. This requires a continuing commitment on the part of the Unified Judicial Branch to converting*

and maintaining its information in a digitized format while recognizing that specific technologies will become obsolete over time. It also requires the establishment and adherence to a migration strategy that recognizes technological advances and incorporates them into the workplace.

This commitment requires data readability, data retrievability, and data intelligibility.²⁵ Data readability means that information may be read on a computer system or device other than the one used to create the digital information or on which it is currently stored. Data retrievability assumes that identifiable information can be selected and accessed. This requires keys or pointers that link the logical record to the physical storage location of the data on a disk. This function is typically performed by a computer's operating system, which is as subject to obsolescence as are other technology components. Data intelligibility means that the information retrieved is understood – whether it be by another computer system or a person. Data intelligibility is impacted by such factors as proprietary file-header labels, data compression techniques, and software obsolescence.

The likelihood of long-term access and use of images is increased if the Unified Judicial Branch is committed to the assurance of digital image quality and continued functioning of selected hardware and software components, the routine monitoring for potential data degradation of stored images, and the anticipation and awareness of technological developments.

19. Support electronic management and monitoring of workflow through the business processes.
20. Support the presence of the court in each of North Dakota's counties.

General Technology Requirements for an Enhanced Records Management System

The following general technology requirements address system-wide issues regardless of the degree of sophistication or implementation of the recommended solution.

1. Open system architecture.

COMMENT. *Open system architecture permits component upgrades with negligible degradation to system functions, allows the system to be upgraded over time without a significant risk of*

²⁵ http://www.archives.gov/research_room/media_formats

information loss, and supports the import and exporting of digital data.

2. Security.

RECOMMENDATION. Some of the records maintained by the courts are confidential and are accessible only to authorized users. Therefore the ERMS must be secure against intrusion from unauthorized users by maintaining different security levels to limit access and operational functions to specified users. The following are suggested specifications on the security levels. The system must maintain different security levels to limit access and operational functions to selected users. All levels require password protection.

- *Level 1: User access is limited to the retrieval, viewing, and printing of images. This security level will allow the general public to examine case records from any workstation within the clerk's office or through remote access.*
- *Level 2: These users will have the ability to input all data and images into the system. This will include the ability to operate the scanning equipment and enhance image resolution, when required, including the ability to re-scan documents and add or delete pages within an instrument. These users also will have the ability to index documents while reviewing the image.*
- *Level 3: This level will have the same functionality as level two, but also will include the following managerial rights:*
 - *Prioritizing workflow.*
 - *Writing to optical disk.*
 - *Generating operation/managerial reports.*
 - *Conducting backup.*
 - *Conducting system recovery.*
 - *Providing security file/table updates.*
 - *Changing index.*

3. Scanner selection criteria.

COMMENT. The document scanner resolution used in the ERMS impacts display screen readability of digital images, the legibility of hard-copy output, and the usefulness of the digital images for future applications. Original scan resolution can never be increased even if future information retrieval technologies require a higher quality image. One should always scan at the highest resolution currently affordable.

Management Requirements for an Enhanced Records Management System

1. Management must provide appropriate training and support for implementation and maintenance of the ERMS.

COMMENT. *The SCAO must have sufficiently trained and experienced staff to operate the ERMS. Its information technology department currently supports the court case management system, UCIS. We anticipate that the ERMS, although most likely some combination of off-the-shelf software for messaging middleware, electronic document management, workflow routing and management, and enterprise reporting, would be integrated and implemented by an external vendor and managed by SCAO staff. SCAO staff will need to receive additional training to fully support the eventual enhanced records management system.*

The executive branch Information Technology Department (ITD) currently provides document imaging support for North Dakota's tax department and is preparing to provide document imaging support for medical records. The ITD experience with document imaging is a valuable resource available to the SCAO. However, we do not recommend that the SCAO utilize ITD as a service provider for the enhanced records management system. ITD's current deployment of document imaging does not appear to allow for the dynamic interaction required to index images to events within the Register of Actions and permit the simultaneous display of information from both the case management and enhanced records management systems. In addition, close integration between the case management and enhanced records management systems preserves the integrity and security of the court record as well as permits Judicial Branch directed case management system enhancements and replacements.

The technological sophistication of courts and clerk's offices varies greatly. While some have technical expertise on staff, many smaller offices cannot justify in-house technology support and are dependent on the SCAO.

The SCAO help desk and training staff provide user support for UCIS and limited hardware support. Due to the varied technical expertise of the courts and the clerk of court offices, the SCAO help desk and training staff will have significantly increased responsibilities during the implementation of the enhanced records management system and increased user support responsibilities once implementation is complete. Supporting the enhanced records management system for all of the court users will be a significant task.

ITD provides and supports the statewide network that is used for both data and video. All courthouses in North Dakota have a T1 or greater connection to the statewide network. While ITD can provide user

software support, it is unlikely that it currently provides this service to the Unified Judicial Branch. ITD does provide hardware support for the statewide network infrastructure.

2. Management (and very importantly, judges) must provide the leadership necessary to shift reliance on paper documents to the electronic case file folder.

COMMENT. *If the ERMS is seen as imposed by the SCAO, rather than developed in cooperation with judges, court staff, clerks of court, and the court's institutional partners, it will not succeed. Judges and their use of the electronic case file folder rather than reliance on printed copies of documents in the electronic case file folder will play a critical role in determining the system's success.*

3. Management must solicit support and commitment from the justice partnership and the bar to initiate and sustain electronic citations and electronic filing for not only traffic cases but other case types as well. This support and commitment should extend to the use and acceptance of electronic funds, electronic service, and electronic noticing wherever possible.

COMMENT. *While the ERMS is an extension of the court's case management system and its primary users will be judges and court staff, inclusion of the court's institutional partners and the bar in its development will advance their participation in and acceptance of the system. Acknowledgement and inclusion of their needs and expectations during development and implementation will assist the Unified Judicial Branch in creating a system that is functional both for the court and its customers. North Dakota may consider forming a user group to assist SCAO technologists in designing and implementing the ERMS.*

4. Management must provide sufficient quality assurance for the ERMS so that court information users are satisfied with the system's reliability, integrity, and accuracy.

COMMENT. *This is particularly important when creating index data and when scanning the documents themselves. Without an accurate index, images cannot be retrieved and without competent scanning, displayed images are not readable.*

5. Management must prepare judges, court staff, and clerk's office staff for the ERMS and the changes it brings with it.
 - a. In the case of court and clerk's office staff, this will involve additional training, adjustment of current processes and workflows, and may involve reassignment.
 - b. Management may have to rewrite job descriptions.

- c. The support of judges is necessary for the success of ERMS. They must, therefore, be confident in their use and understanding of the system.

COMMENT. *No change is easy to make and making no changes cements systems and processes in the past. The introduction of technology designed to automate processes previously done by people will result in the fear that current staffing levels and skill sets are no longer appropriate. This may very well be true and it should be acknowledged and addressed from the very beginning. Technology will change the jobs people do and it may change the people doing them.*

6. Management must determine policies identifying the scope of the conversion of paper documents to the ERMS.

COMMENT. *The NCSC project team recommends that paper documents be converted from a point forward. Cases filed prior to initiation of the conversion effort should be converted on an "as needed" basis.*

7. Management must determine the appropriate levels of scanner resolution for each document type scanned. Management must also determine the dynamic range of gray-scale and/or color imaging for continuous tone images.

COMMENT. *The technologist should guide management through this process. While the technologist may better understand the technical details of resolution, gray-scale, and continuous tone images, it is the user that must ultimately work with the imaged documents. The better the resolution is, the more expensive it is. A cheap scanner can be a shortsighted savings. Management needs to determine the quality of the image required for the ERMS to be a usable system.*

8. Management must determine the extent of use of image enhancement technologies within the ERMS and its impact on confidence in the system's reliability and integrity.

COMMENT. *Image enhancement technologies should result in a more readable and usable image. However, image enhancement technologies could also be viewed as a modification to the original document. This issue has not yet been litigated as to what, if any, affect the use of an image-enhanced electronic document has on legal proceedings for the case of which the image-enhanced document is a part.*

Business Process Re-engineering

In order to best utilize the technology of an enhanced records management system, a number of changes must be made in the business processes of each court. We cannot detail the specific changes that will be necessary for each court that participates in the ERMS because each court handles its processes somewhat differently. However, we have categorized some of the broad changes that should occur.

1. Access to the Electronic Case File Folder

The most significant change in business process and the change having the most impact will be the availability to authorized users of the electronic case file folder. Public users of case file information can access the electronic case file folder at a public access workstation within the courthouse. The electronic case file folder can be downloaded to CD for judges in preparation for scheduled hearings and trials. In addition, the ERMS can make documents available remotely via the Internet to both authorized users and modified access and views for the public.

Prosecutors, defense attorneys, litigators, and the public would be able to access, via a computer, the same information that can be viewed today by appearing at the courthouse in person and requesting the case file jacket.

2. Case Initiation

Case initiation will fundamentally change if the court encourages the participation of its institutional partners in electronic filing processes. As discussed in the JUSTICE SERVED™ study, traffic cases, paternity and child support cases, and misdemeanor DUI cases present the best opportunity for the elimination of paper documents and acceptance of filing information in electronic format. This is particularly true for Cass and Grand Forks counties because of their caseload volumes. In addition, in some counties, other components of the justice partnership such as the prosecutor already use case management systems and office automation to track their cases and generate their pleadings. Word processing software is used by every prosecutor's office in the State. In those offices with prosecution case management systems, the prosecutor creates a case and enters defendant and charge data as well as administrative details such as the prosecutor assigned to the case. The pleading is then prepared utilizing word processing software, saved in electronic format, printed, and the printed copy filed with the clerk's office. Once there, using a computer, the clerk extracts details of the case including defendant, charges, assigned prosecutor, and enters those into the court's case management system. He or she will also scan the printed document, converting it to a digitized format, and file the paper document. An enhanced records management system would change this process by

accepting data from the prosecutor's case management system into the court's case management system. It will also accept the electronic document into the court's electronic case file folder. The clerk would quality assure the process.

Even in those instances where paper documents are still used, immediate scanning of those documents into digitized representation will allow the information to be queued and move through the workflow governing the working of the case through the courthouse.

3. Calendaring and Courtroom Preparation

The calendaring function is managed through the case management system with the case being assigned appropriate court dates and times depending on the type of case, its status, and its position within the predefined workflow for that case type and status. These business rules are defined by statute, court rule, and local practice. The ERMS would supplement the calendaring function by preparing courtroom queues containing the electronic case file folders assigned for a particular date and time. These queues of electronic case file folders would be available before a particular session for review, modification, and re-sorting as needed or desired. Instead of reviewing a copy of the file that may or may not match what the court actually has in its records, a prosecutor can review the file that will be actually be used in court.

The clerk's office will no longer have to pull case file jackets and take them to courtrooms. They will verify the cases already queued based upon information in the case management system concerning a particular hearing and either approve the queue for distribution or modify and update its components.

4. Courtroom Activity

The pace and flow of cases through the courtroom itself will change significantly. Instead of the case file jacket being handed to the judge who writes minute orders on the back of the register of actions, the session can be driven by the judge who, using the computer located on the bench, pulls cases from the courtroom queue, hears them, makes decisions, updates them, and releases them to the clerk of court's office for compliance activity. Alternatively, the judge can have the courtroom clerk drive the session at his or her direction, calling cases, updating each case with the outcomes of that day's events, and releasing the case for compliance activity. Documents are generated electronically based upon the data entered in the case management system and the templates controlled by the document management system.²⁶ Defendants and

²⁶ In Miami-Dade Florida, judgment and sentence menus have been customized for each judge hearing traffic cases so that if he or she has a particular style of language or choice of sanctions, they can be incorporated into the document generated, printed, and given to the defendant.

attorneys can pick up printed orders containing the judge's electronic signature at the clerk's office or in the courtroom itself.

5. Compliance Activity

In those instances where a defendant's signature is required, the electronic document can be routed to a signing station equipped with an electronic signature pad and non-detachable stylus, which the defendant uses to sign his or her name. The signature is affixed to the electronic document and the document is then printed.²⁷

6. Managing and Monitoring Workflow

A supervisor can utilize the ERMS to determine what work remains to be done, where that work is in the process, and whether or not work should be redirected to another workstation to relieve a logjam in the workflow. This is particularly important if indexing, imaging, verification, and quality assurance become backlogged when dealing with paper documents. There are also benefits by monitoring output and throughput as well as the quality associated with employee's performance.

Pilot Program

Prior to a statewide implementation of an enhanced records management system, a pilot program should be done to test the assumptions and expectations of users and technologists concerning the ERMS. The success (or lack thereof) of the pilot will certainly change and inform the final form of the ERMS. In addition to a pilot program, the development of the ERMS should be done in phases to allow for a smooth transition from paper to electronic documents. The phases the NCSC project team suggests are 1) Imaging Paper Documents, 2) Extending Access to Imaged Documents to Institutional Partners; 3) Adding Electronic Citations to Imaged Documents; and 4) Adding Electronic Filing to Imaged Documents. These four phases are intended to create a successful track record in the use of the electronic case file folder within the Unified Judicial Branch before extending its use to those outside the Branch. Once the justice partnership is accustomed to the electronic case file folder created from imaged documents, images of paper citations can then be replaced with electronic

²⁷ A signing station and electronic signature pad are used for orders of protection in the Bronx New York Misdemeanor Domestic Violence Court. The subject of the protection order is able to sign acknowledging receipt of the order and awareness of its conditions as soon as it is issued. The order is then printed and served immediately on the subject.

citations. However, the bulk of the work required to make this change is outside the Unified Judicial Branch and requires the cooperation and coordination of law enforcement agencies throughout the state. The addition of electronic filing of other case types will involve not only the court's institutional partners but also members of the bar. Appendix D illustrates these four phases.

This section of the report discusses recommendations intended to assist the SCAO in planning a pilot program beginning with creation and access to electronic court records and moving towards the eventual statewide implementation of an enhanced records management system. Given the experience gained during the pilot program, changes in strategies may prove necessary.

Scope of Pilot Program

The SCAO must first determine the scope of the pilot program. In making this decision, the SCAO should include the Supreme Court, trial court judges, court and district administrators, court and clerk's office staff, and the state archivist or state records administrator. In addition, representatives from the justice partnership should also participate. This accomplishes two goals. It gives notice that processes are going to change and involves the court's customers in determining exactly what those changes will be.

The scope of the enhanced records management program defines what documents are included in the enhanced records management system and on the optical disk archive, identifies the extent and method²⁸ of back file conversion, and determines optimal settings for each document type. Most likely the initial scope as suggested here will undergo refinement

²⁸ Back file scanning can be done by current staff in addition to other tasks and assignments or may be outsourced to a service bureau. There are benefits and risks to each possibility. Current staff may never have the time to scan back files but will understand and be able to verify file content. A service bureau may present security concerns, will mechanically scan the documents found in the file, and present a readily observable additional cost. However, a service bureau will complete the task.

during the pilot program. This refinement will redefine the scope of the statewide enhanced records management system. The final scope of the enhanced records management system should be adopted by the Supreme Court as a modification of court records management rules.²⁹

For the pilot program, the NCSC project team recommends that document imaging commence with a point forward approach. All new filings as of a certain date should be scanned. Active and closed court records as of the scan commencement date may be scanned as they are needed, as time permits, or bundled and outsourced. We also recommend that all case file documents be scanned including those documents that are not a part of the register of actions. However, only the critical and official case file information should be committed to optical disk for archival purposes including all pleadings, summons, minutes, and orders.

Initial Case Type

Considering the functions of the clerk's office in the trial courts and the information requirements of internal and external users, the NCSC project team recommends that a pilot program begin with civil case processing. The civil case type was selected for the following reasons:

- Civil case filings remain active for relatively long periods of time when compared to criminal cases. Criminal cases are governed by speedy trial rules. Traffic and misdemeanor criminal cases are generally thought to have a shorter case life than either felony criminal or civil cases.
- Civil cases typically consist of more and longer documents than criminal cases.

Once document imaging has been introduced for civil cases, the expertise gained from that experience can be applied to criminal cases followed by traffic, gradually ramping up the effort and speed required as staff become more proficient. Civil cases will teach the method of document imaging

²⁹ N.D. Sup. Ct. Admin. R. 19 - Court Records Management Program, N.D. Sup. Ct. Admin. R. 26 - Court Records Management, and N.D. Sup. Ct. Admin. R. 45 - Records Management Program for Supreme Court Records.

and indexing as well as the use of the electronic case file folder.

Expansion to criminal cases will require attention to the timing of imaging within the life of the case, its impact on workflow, and permit expansion of the use of the electronic case file folder to the court's institutional partners. Imaging traffic cases will truly make the court "less paper"³⁰ intensive.

Selection of Courts to Participate in the Pilot Program

Several factors must be taken into consideration in the selection of a particular court to participate in the pilot program.

1. Caseload

The SCAO should consider courts with low to medium caseloads. The lower caseloads will be less demanding on equipment and staff and allow for more analysis and experimentation with different procedures.

2. Logistical Considerations

As noted in this report, courts participating in the pilot program may need significant support, particularly during installation and startup. It is to be anticipated that some of the support issues will require on-site attention. Due to the possible need for on-site support, the SCAO should consider courts in relative close proximity to the SCAO offices and not more than two hours driving time away.

3. Technology Available to the Courts

A significant consideration in selecting the pilot sites is the technology that the local courts have available to them. The two major technology issues facing any pilot site, and the statewide implementation, are hardware in the courts and communications infrastructure to move the images between the local courts and the SCAO's imaging server.

As previously indicated, the local courts have limited technology appropriate for imaging in place. The hardware required by the trial courts for imaging can be acquired relatively inexpensively. However, even inexpensive equipment may represent a challenge to the SCAO given the current budget situation.

As documents are scanned, the scanned images need to be sent to the SCAO's imaging server to make them available to all

³⁰ As opposed to paperless.

users. There are two basic approaches to accomplish this. One approach is to have the scanning stations continuously connected to the SCAO imaging server and immediately place document images on the server. This real-time approach will provide the best performance to the users because document images are instantly available to all users. Most courthouses should have sufficient bandwidth through the T1.³¹ However, larger courts may require expanded bandwidth to handle the necessary data transfer. Expanding the bandwidth for the courts can prove very costly. The other approach is to store the document images on a computer located at the court and periodically or at night send the index and images to the SCAO's imaging server as a batch. The batch transfer could be accomplished using the court's existing communications links during non-business times. A batching approach could produce savings by utilizing communications links when these links are normally idle. The batch option has a significant liability, as access to the imaged records is limited to the local court users at the court where the document was scanned until the images are sent to the SCAO.

The pilot program should be used to test various solutions. The results of this testing should be used to guide the SCAO in determining the most appropriate solution for the statewide implementation. The higher case volume in larger courts participating in the pilot program would give the SCAO a good gauge of the bandwidth required for imaging.

4. Judicial and Clerk's Office Leadership and Willingness to Participate

In order for the ERMS to succeed, the pilot program must succeed, and the only way the pilot program can succeed is if both judges and clerk's office leadership are willing to undergo and understand the hardship and disruption inherent in being first.

5. Timing

Courts selected for the pilot program should be participants in its development, deployment, timing, and evaluation as well as the development of requirements for modifications to the case management system so that it may point to the index for documents held in the ERMS.

³¹ Bandwidth. The amount of data that can be sent through a given communications circuit per second.

Implementation Plan for Pilot Program

This section describes a high-level implementation plan for the pilot enhanced records management project in the selected courts. A proposed schedule for the steps in the plan follows:

Implementation Steps and Schedule

	M1	M2	M3	M4	M5	M6	M7-9	M10-12
Preliminary Functional Design	X							
Specify, Program, and Test Modifications to Case Management System		X	X					
Order Hardware and Network Upgrades			X					
System Training				X				
Installation Testing					X			
User Training and Job Reallocation						X		
Pilot Period							X	X
Evaluate Pilot and Refine Workflow Processes								X

A few references are available for SCAO staff to obtain design and implementation ideas.³²

1. Preliminary Functional Design

Once the courts for the pilot program have been selected, the SCAO should meet with their judges and clerks and the selected vendor. This planning group will help to formulate the procedures for integrating the enhanced records management system with the court's workflow. Working with the vendor, the planning group will examine technical solutions for equipment and communications. The SCAO should work closely with the courts throughout the design and, later, the testing phases to determine the exact procedures for scanning documents, verifying clarity of images, and rescanning documents when necessary. This interaction will be critical to the success of the pilot program and the subsequent statewide system.

2. Specify, Program, and Test Modifications to Case Management System

In order for document imaging to be of value, the images must be accessible through the case management system. The case management system must be modified to include the index value

³² *Court Technology Reports*, Vol. 5, "Document Imaging", by Carter Cowles, National Center for State Courts (1995); "Oregon Judicial Imaging System Pilot Project Evaluation", by John T. Matthias, National Center for State Courts (1993).

assigned to a particular document entered in the register of actions and point to the messaging middleware for retrieval of that document via the document management software. In addition to changes for the register of actions, query options should be included in the case management system to trigger display of the requested document image. The use of the options should be seamless to the user although it will necessitate opening a second window for document display and activation of the document management software to make the search, find, and display of the document possible.

It is estimated that modifications to existing UCIS functionality may cost between \$20,000 and \$45,000 if done by an outside consultant. It will be necessary to ensure that case management system changes integrate with the messaging middleware and the document management software. The NCSC project team recommends that the SCAO construct an RFI to identify appropriate vendors for both the messaging middleware and the document management software. Because the case management system should remain the portal to the document management software through the messaging middleware, it may be appropriate for that vendor to make the modifications to the case management system to ensure a tight integration.

3. Order Hardware and Network Upgrade

After users and technical staff design the architecture of the enhanced records management system in relation to the existing systems, the technical staff will proceed to implement technical decisions. This stage will include obtaining and installing hardware and communications solutions and installing the enhanced records management software. Technical staff will need to determine if they can recommend that certain workstations can be used as imaging workstations (through hardware upgrades and a larger monitor), or whether new hardware must be obtained.

The physical layout of equipment and placement of staff in the clerk's offices will require some redesign of work areas to accommodate document imaging and the redesigned workflow.

Furniture/desktop equipment. Imaging workstations will be larger than the current workstations. In particular, the monitors will be larger, requiring additional desk space.

Space for scanning operation. The footprint of the scanner must be added to the desktop or table space. Additional workspace to place scanned documents and those waiting scanning will also be needed. The table should be of a height to enable the scanner operator to either remain seated while feeding documents into the scanner and retrieving scanned documents, or to stand while performing these functions, and

the table surface area should be large enough to handle documents being scanned.

4. System Training

SCAO staff must learn how to support the enhanced records management system. The vendor should provide technical training to enable SCAO staff to perform all system functions on vendor-supplied hardware and software.

5. Installation Testing

After the imaging capability is added to the workstations, court users and SCAO staff should design and execute a series of tests to determine whether or not the enhanced records management system is operating as required. Users in the clerks' offices should develop test scripts to test all reasonable, and some unreasonable, conditions that may arise during production.

6. User Training and Job Reallocation

The enhanced records management system vendor and SCAO staff should provide training to users on how to perform various functions associated with document imaging. The test scripts developed during installation testing can form a basis for training users on how to use the enhanced records management system. Although the enhanced records management system vendor will furnish some training, a significant amount of new information which users will need to know will be developed in-house during installation testing. The SCAO should supervise development of training materials and coordination with vendor-provided materials. Once the initial training is completed the SCAO staff should be able to support the required continuing training.

The enhanced records management system will eliminate certain current manual operations and create other operations. This will require the clerks to reallocate duties among staff in the clerks' offices. New operations to scan documents and verify clarity of images will be instituted. Revised job descriptions should be developed to itemize new and continued tasks of all staff in the offices. The process of recording changes to job descriptions will highlight the reallocation of tasks.

7. Pilot Period

The project team recommends that document imaging proceed on a date-forward basis initially; that is, all documents received as of a certain day forward will be scanned. The enhanced records management system will run in parallel with some manual procedures. A 9-to-12 month pilot period is recommended.

The courts and the SCAO may formulate criteria for back-scanning certain cases; that is, scanning all or certain documents in currently active cases, where case processing would benefit from having the documents available electronically. Generally speaking, the cost of converting active cases to images may not be justified, considering how close a given case is to completion. Documents from closed cases should be scanned only on an as requested basis, meaning that when a record is requested from a closed file that record, or the entire case file, is scanned. The costs for converting all closed cases to images most likely cannot be justified.³³ The SCAO and courts could identify case and document types that are more often accessed after the case is closed, such as domestic relations cases and orders, and establish a conversion plan for these case types.

8. Evaluate Pilot and Revise Workflows

The SCAO must develop evaluation criteria for the enhanced records management system. The evaluation must involve the court staff working with the scanning system. The court staff and the SCAO must continually monitor the workflow and case processing to assess the influence of organizational changes and technical changes incorporated in the operations of the clerks' offices during the pilot phase. The most important aspects to evaluate are workflow, records access, and document inclusion. The SCAO must work with court staff to review the workflows to identify changes that enhance performance, such as speed, accuracy, and customer service. This information will provide the basis for work procedures in other courts as enhanced records management is expanded. The SCAO should establish an automated monitoring system to report on records accesses, yielding statistics based on case type, age, document type, etc. These statistics should be used to determine the necessary extent of any conversion plan for closed case files.

Extending the Pilot Program to Other Casetypes and Courts

After a period of successful operation for the pilot program of about six months, the SCAO should expand implementation to criminal cases. Lessons learned in implementing enhanced records management for civil cases can be applied to facilitate extending it to other case processing, such as domestic relations and juvenile, as well as to other courts.

³³ Minimum commercial scanning cost for back file conversion (more than 1 million pages) is about 5 cents per page. This cost covers only the scanning and does not include the time to pull, prepare, and re-file the documents.

After the enhanced records management system in the pilot sites is fully implemented, the SCAO can consider the costs and benefits of implementing enhanced records management in other courts. The SCAO should establish a limit on the number of courts where the enhanced records management system will be implemented at any one time to allow for the necessary support availability. The number of courts simultaneously involved in implementation will vary depending on the size and complexity of the courts. The SCAO could develop a canned implementation for smaller courts, i.e., 1 workstation, based upon the pilot sites' experience. The larger courts will require a more custom plan for each court. Starting with smaller courts and moving up to larger courts may be a logical way to proceed in implementing the enhanced records management system throughout the state. Alternatively, SCAO staff may be confident enough to implement the enhanced records management system in a larger urban court operation and at smaller courts simultaneously.

Hardware Requirements

The following requirements are high-level, minimum requirements to guide trial courts in purchasing workstations. Following the pilot program, the SCAO should develop specific requirements based on what has been learned. It is recommended that the SCAO use the state purchasing schedules to purchase the workstations from a single vendor and hopefully make the workstations more affordable for courts with limited budgets. Additionally, the SCAO's support duties will be eased by using a single vendor and system configuration. Another equipment acquisition approach that the SCAO should investigate is leasing. Leasing has some of the same advantages as purchasing from a single vendor, including volume cost advantages and consistent system configuration. An additional advantage to leasing is the regular replacement of workstations. Whether the SCAO decides to purchase or lease the workstations, the contract should specify that the vendor provide support, both by phone and on-site.

1. Scanning Workstation Requirements

It is recommended that the scanning workstations be configured to meet the video display demands of document imaging. The workstation configuration should be at least equal in performance capacity to the following specifications:

- a. The workstation should have a Pentium III 500 or better CPU. The SCAO should consider including image processing accelerator boards for the high volume courts in particular and possibly for all imaging stations.
- b. The workstation must be configured with sufficient memory (256MB RAM), cache, and hard disk storage, if required, to facilitate the retrieval of any document's images and to emulate the case management system. The hard disk storage must be sufficient to store several days of imaged documents to permit the station to continue to operate when the imaging server is unavailable for file transfers. The disk space required will vary between individual courts due to differing caseloads. For smaller courts a 20GB hard disk space dedicated to imaging could be sufficient, medium sized courts may require 40-60GB dedicated and large courts may need 100GB or more dedicated. These estimates are a best guess based on what documents are stored.
- c. The workstation should include a removable media backup system. A system backup capturing stored image files must be run daily.
- d. The workstation must include at least a 19", preferably 20", monitor. The workstation is required to have ample memory (minimum 64MB VRAM) for the monitor to display images without any excessive delay. The images should be displayed quickly (i.e., five seconds) on the monitors with little delay for any screen repaints (i.e., zooming and paging). The clarity and legibility of these images is extremely important.
- e. Workstation must have full-page screens for ease of use.
- f. There must be the ability to easily browse next page, next document, previous page, etc. Acceptable range is one to two seconds to refresh screen.
- g. When panning or scrolling, the response time to begin screen repaint between views (i.e., zoom in/out) must be less than two seconds 90 percent of the time. The response time for the complete screen repaint should be less than two seconds 90 percent of the time.
- h. The workstation will need a network interface card.

2. Printer Requirements

It is essential that the courts have the ability to produce hardcopies of scanned documents when documents are requested. Court copies provided to requestors must be high quality accurate reproductions of the imaged documents. The quality required necessitates the use of laser printers to produce court copies. Specifications to be met include the following.

The SCAO should work with each court to develop an appropriate mix between individual and shared laser printers, sufficient to handle the paper volumes and graphic diversity of court documents. For the pilot program a single laser printer directly or network connected to the scanning workstation should be sufficient.

Each unit should have the ability to print data and image documents of at least 8 pages per minute with minimum resolution of 300 dpi for images and 150 dpi for text/data. Printer must be able to handle 8½" x 11" and 8½" x 14" multiple weight paper.

3. Scanner Requirements

The scanner is a critical component of the imaging system. It is important for the selected scanner(s) to meet operational requirements. The following operational requirements should provide the performance the courts need for all small and most medium size courts.

- a. Ability to scan a minimum of 15 pages per minute, single sided. Larger courts will need scanners with the ability to scan 50-75 pages per minute.
- b. Ability to scan mixed size original documents ranging from 8½ x 5" up to 8½" x 14" and documents of various paper weight, ink color, and/or poor physical quality.
- c. Ability to scan at 200 dpi³⁴ to 600 dpi.
- d. Ability to scan both sides of a single piece of paper in one pass.
- e. Must support dithering and an appropriate gray scale level to accommodate the record types and conditions present in the court case processing.
- f. Compliant with the Twain or ISIS scanner interface.
- g. The scanner(s) must maintain a minimum rate of 2,000 pages per day while scanning. The scanner(s) must maintain high operational reliability with minimum downtime for repairs.

³⁴ Although a scanner resolution of 200dpi is adequate for many applications, it is recommended that the SCAO adopt a higher scanner resolution to preserve the readability of imaged court documents.

4. Document Imaging Application Server Requirements

The document imaging application server will require sufficient processing power to manage document storage, retrieval, and indexing functions. A separate database server may be required for the indexing function. Specifications to be met include the following.

- a. Dual or quad 1.8 GHz (or better) CPUs.
- b. 4 GB of memory (or better).
- c. Dual 10/100/1000 MB/s network interface cards.
- d. Internal SCSI disks with 40 GB of free space.
- e. Additional hard drive storage system, RAID preferred. 1 GB disk space per 20,000 documents.
- f. The server must include a removable media backup system.
- g. Dual power supplies.
- h. UPS.

The NCSC project team has included a list of technology vendors in Appendix A. We do not, as policy, recommend specific vendors but discuss only requirements. We do recommend that the SCAO carefully review the experience of ITD and determine if appropriate incentives exist for the SCAO to consider leapfrogging onto any existing purchasing agreements for the pilot program.

Appendix B contains a list of estimated costs for components necessary for the pilot program.

Appendix C is a logical representation of the ERMS.

Implementation of an Enhanced Records Management System

Based upon the pilot program experience, the Unified Judicial Branch needs to consider whether it will move forward with full service electronic filing processes or confine itself to creation of and access to the electronic case file folder.

Should it decide to move no further, a viable document imaging and access system will be in place, requiring only the expansion of document imaging to other casetypes. The likely compromise is a system that mixes electronic filing for traffic citations in high volume courts and adjudication of those citations utilizing the enhanced records management system as described in this

document while other courts and other casetypes remain paper-based. Regardless of the outcome, records retention remains an issue to be addressed. With document imaging, the issue of how long to keep a particular record becomes moot as long as the Unified Judicial Branch remains committed to technological upgrades and enhancements so that images may continue to be accessed. The more important issue is what cases should remain immediately accessible and which should be off loaded from the imaging server to secondary storage. With the case management system remaining the portal to the enhanced records management system, archival criteria should match. Index data should remain searchable as long as an individual's previous court and compliance history may be a factor in a case currently before the court. This is true in the case of civil protection orders as well as for traffic, misdemeanor and felony criminal, and juvenile cases. Any case that may require the court's attention (probate, divorce, and child support) should also remain immediately accessible even though the case may be considered closed for dispositional purposes. Cases that result in action by the court of last resort should also remain accessible.

Implementation Plan

As noted previously, NCSC recommends that the SCAO move forward with the ERMS development independently of ITD. At present ITD has implemented only records storage with little integration to existing information systems. The SCAO needs to procure the services of a qualified vendor to integrate the selected document management solution with UCIS. Even if the SCAO selects the Filenet document management system, a qualified integration vendor should be brought in to integrate the document management system with UCIS.

Following the pilot project the SCAO will need to prepare to implement the ERMS in the remaining courts. ERMS implementation requires the SCAO address several issues such as estimating the storage requirements, court operations continuity, hardware requirements, and determining an implementation approach.

Estimating Storage Requirements

One approach that the SCAO can use to estimate the electronic document storage needs of the courts is to use historical information to establish the number of pages or paper volume of a case. For simplicity this exercise assumes a 5-year retention cycle for a particular case type.

- Select one year's volume of archived cases, e.g. 1996.
- Convert the volume of archived cases to pages, i.e. 8 boxes = 20,000 pages = 1 GB.
- Identify how many cases were filed in case year being archived, e.g. 1991.
- Divide the total number of pages by the number of cases filed to obtain a rough estimate of the average number of pages in a case.

This method will over estimate the number of pages per case due to the case file jackets in the archived materials. The over estimate should provide a sufficient buffer for the inherent imprecision in this method. Additionally this method will over estimate the storage requirements for "born digital" documents. Typically born digital documents occupy a quarter or less of the storage space of scanned documents, e.g. the digital size of a scanned page is ~50 KiloBytes and a PDF page is ~10 KiloBytes.³⁵

V = volume of archived cases converted to pages (8 boxes = 20,000 pages = 1 GB)

C = number of cases filed in case year being archived (e.g. number of cases filed in 1991 for cases archived in 1996)

P = estimated average pages in a case

$$P = V / C$$

The SCAO can apply the estimated page count to the courts' projected caseload growth to derive the anticipated storage requirements.

L = projected case load

P = estimated average pages in a case

S = estimated electronic storage requirements in GB

$$S = (L * P) / 20,000$$

³⁵ Steve Gilheany, *Document Imaging Document Management (DMC) Summary*, ArchiveBuilders.com.

Court Information Redundancy

With the commitment to technological support of mission-critical functions, it is also necessary to make a commitment to business continuity planning. With technology as a core component of how courts do their work, the SCAO should consider the need for the courts to maintain court operations in the event of any sustained communication disruption in STAGENET or an individual court's access to STAGENET. If STAGENET is not available, neither UCIS or ERMS will be available. There are many options to address this issue from a full statewide redundancy with copies of electronic case files stored locally with each court to complete manual backup procedures and return to use of paper files to continue court proceedings. Neither approach is probably appropriate. The Judicial Branch should determine to what extent interruptions in access and use of the ERMS is tolerable. Different courts may have different needs and different solutions may be viable depending on size of the court, number of judges, and volume of cases. ERMS could be configured to provide each court with a local copy of its electronic case files. Or all cases scheduled for a particular court on a particular day could be downloaded to either a local server or burned to a CD.

Hardware Configurations

1. High Volume Courts

High volume courts will require either three or four scanning workstations with attached low volume scanners and appropriate printers. The high volume courts may want to have additional image reviewing workstations to handle the additional load. Three scanners, one for civil case types, one for criminal, and one for traffic, should be more than sufficient to process the current caseload and provide capacity for several years of caseload growth. The over capacity will provide an additional benefit of having redundant capacity when a scanner fails.

Cass County may have a sufficient case load to justify two high-volume scanners.

2. Medium Volume Courts

Medium volume courts will require two imaging workstations, two low volume scanners, appropriate printers, and a single image server.

Two scanners, one for civil case types and one for criminal and traffic, should be more than sufficient to process the current caseload and provide capacity for several years of caseload growth. The over capacity will provide an additional benefit of having redundant capacity when a scanner fails.

3. Low Volume Courts

Low volume courts will require a single workstation/image server, a low volume scanner, and printer. For the low volume courts a single machine should be sufficient to handle both the workstation and image server functions.

Phased Approach

Based on what is learned in the pilot project the SCAO will need to review case processing procedures in the courts and develop recommendations for the courts to integrate the ERMS into court operations. NCSC recommends the SCAO implement the ERMS for civil case types, e.g. civil, domestic relations, probate, etc., first. The criminal and traffic case types should follow once the courts are satisfied with the civil case processing. The SCAO should develop a phased approach to implementing the ERMS in the courts rather than try to implement the ERMS in all courts simultaneously. Using the knowledge and experience gained from the pilot project the SCAO could develop standard implementations for the low and medium volume courts. Using the standard implementations for low and medium volume courts the SCAO should implement the ERMS in these courts at a rate that the SCAO staff can easily support to provide staff resources for unforeseen issues. The SCAO should start with low and medium volume courts closer to their offices. The proximity of the courts to the SCAO offices allows for easier support and to refine the implementation process to make the later more remote implementations more trouble free. The high volume courts will require more customized approaches. The SCAO should implement the ERMS in the high volume courts sequentially so that only one major implementation is occurring at any one time.

Appendix E contains a cost estimate and a logical representation for the statewide ERMS, as well as estimated storage requirements by county.

APPENDIX A

List of Technology Vendors

Technology Vendor List

Mr. James F. DeFerrari
Government Industry Marketing Manager
FileNET Corporation
434 Exeter Street
Sacramento, CA 95864
(916) 359-3248/Fax (916) 971-0462
E-mail: jdeferrari@filenet.com
Internet: <http://www.filenet.com>

Mr. Mark Griffis
Business Development Manager
WIZNET, Inc.
360 North Congress Avenue
Delray Beach, FL 33445
Phone: (800) 297-5377 Toll-Free
(561) 272-7710 ext 221
E-mail: MarkG@wiznet.com
Internet: <http://www.wiznet.com>

Hershey Business Systems, Inc.
14111 Freeway Dr., Ste 100
Santa Fe Springs, CA 90670
Contact: Jeff Sallee, Vice President.
Telephone: 800-722-4454
<http://www.hershey.com/>

Hyland Software, Inc.
28500 Clemens Road
Westlake, Ohio 44145
Phone: 440.788.5000
Fax: 440.788.5100
Email: hyland@onbase.com
<http://www.onbase.com/>

ECS/Tyler Colorado
PO Box 1020
Eagle, CO 81631-0120
800-554-4434
<http://www.ecsplus.com/>

Real Vision Software, Inc.
3700 Jackson Street Suite 203
P O Box 12958
Alexandria, LA 71315-2958
<http://www.realvisionsoftware.com/>

Legato Systems
Corporate Headquarters
2350 West El Camino Real
Mountain View, CA 94040
Phone: 650-210-7000
Fax: 650-210-7032
www.legato.com

IMAGE-X
30 South La Patera Lane, Suite 8
Santa Barbara, Ca. 93117
Telephone: (805) 964-3535
Fax: (805) 683-8525
<http://www.imagexx.com/>

APPENDIX B

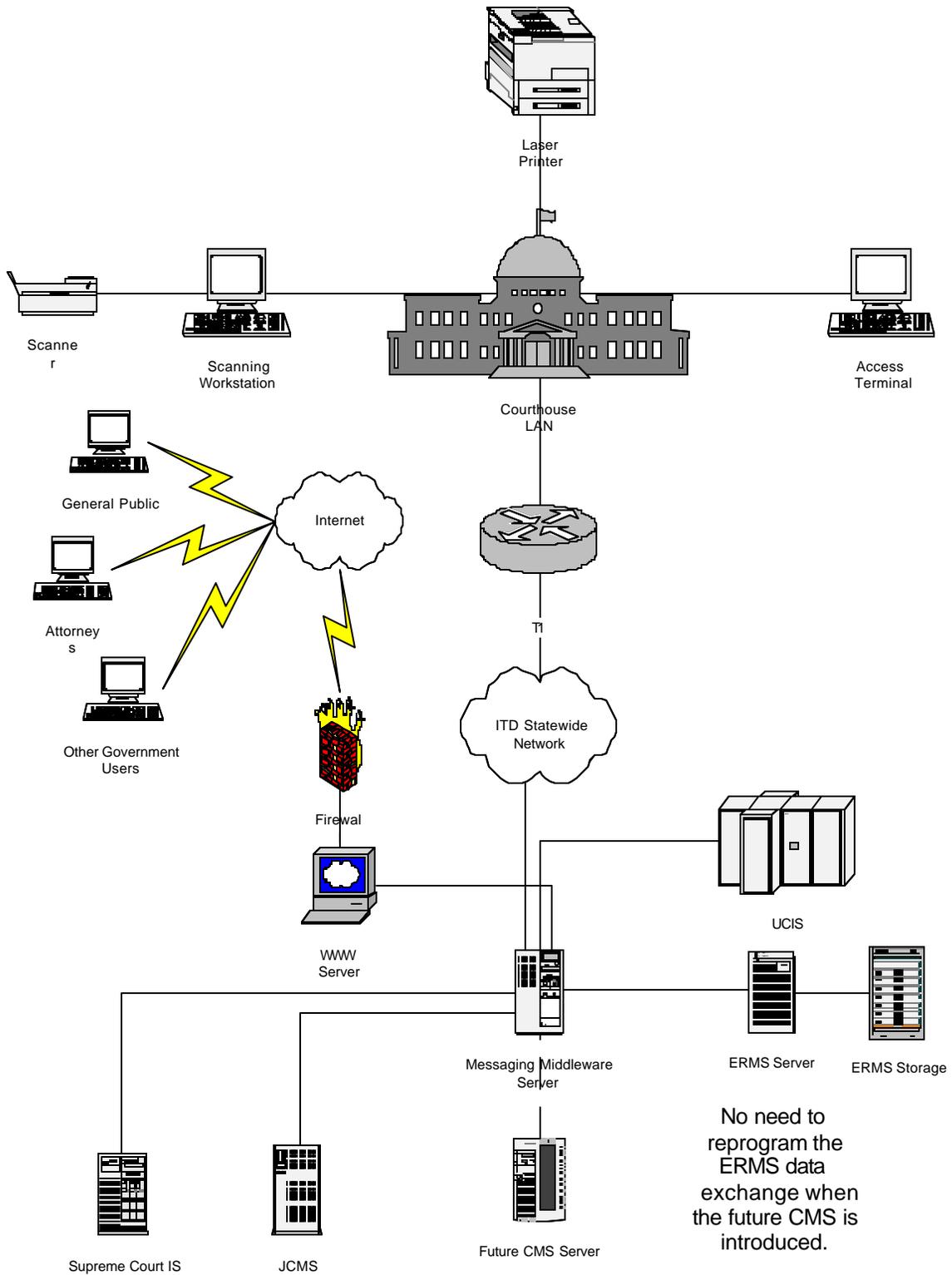
Estimated Costs for Components Necessary For the Pilot Program

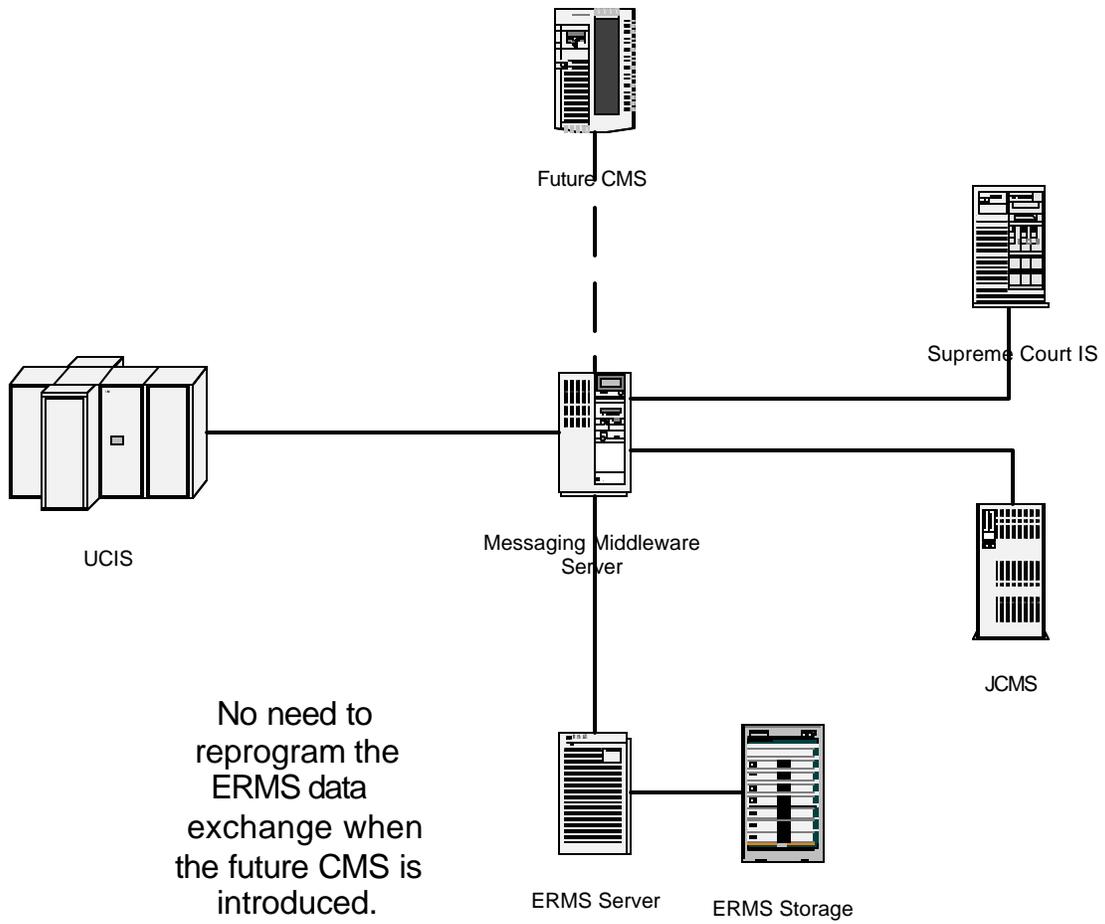
ERMS - Estimated Costs

Component	Estimated Cost
Imaging System	\$350,00-600,000
Modifications	\$50,00-100,000
Workstations (each)	\$1,000-1,500
Scanners (each)	
High volume	\$2,500-20,000
Low volume	\$500-1,000
Servers (each)	\$8,000-15,0000
Storage	
Optical (jukebox)	\$60,000-100,000
NAS	\$10,000-20,000
SAN	\$50,000-125,000
Middleware Software	\$7,000-25,000
Middleware Servers (each)	\$8,000-15,000
Training	\$30,000-100,000

APPENDIX C

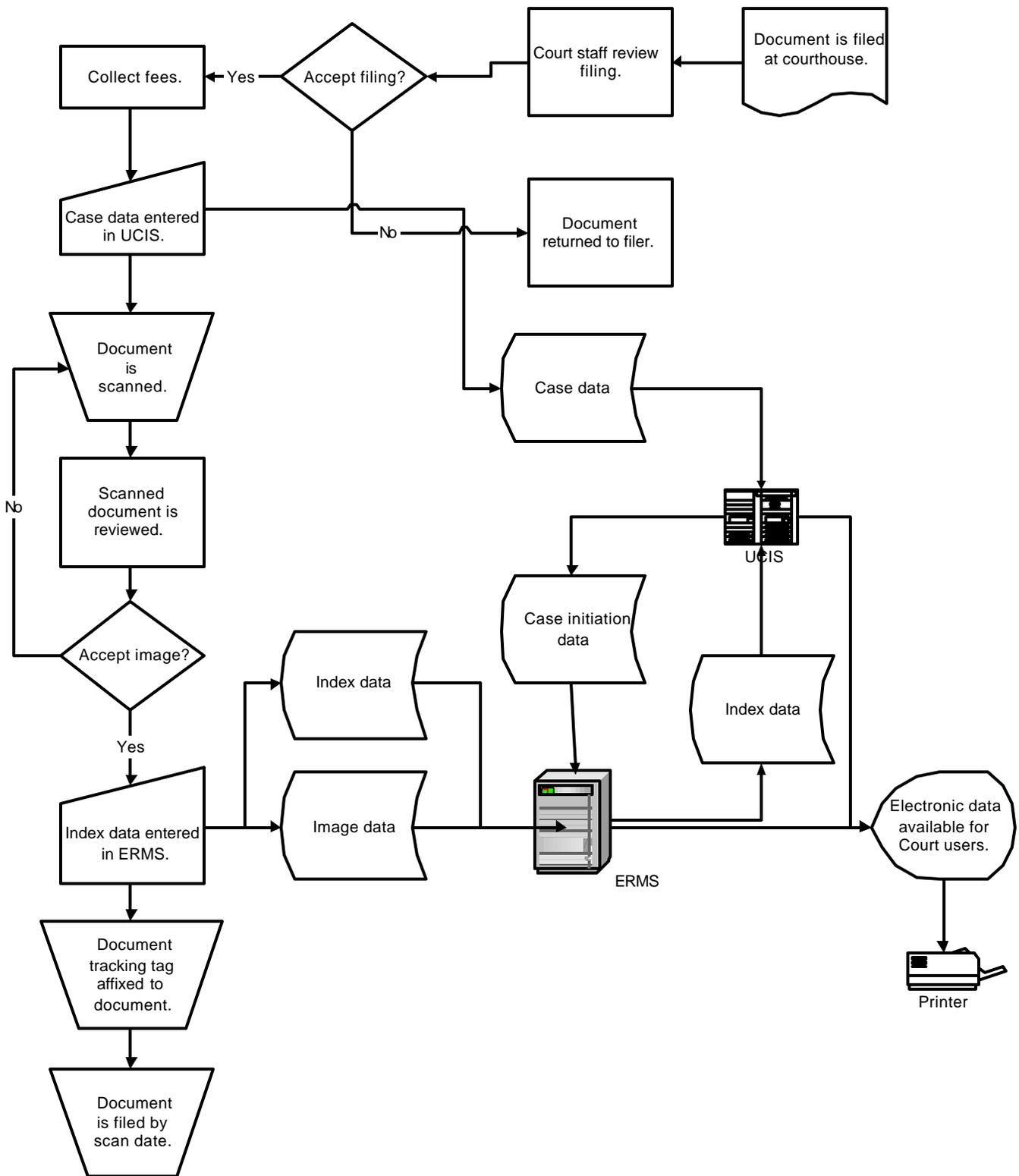
Logical Representation of the ERMS

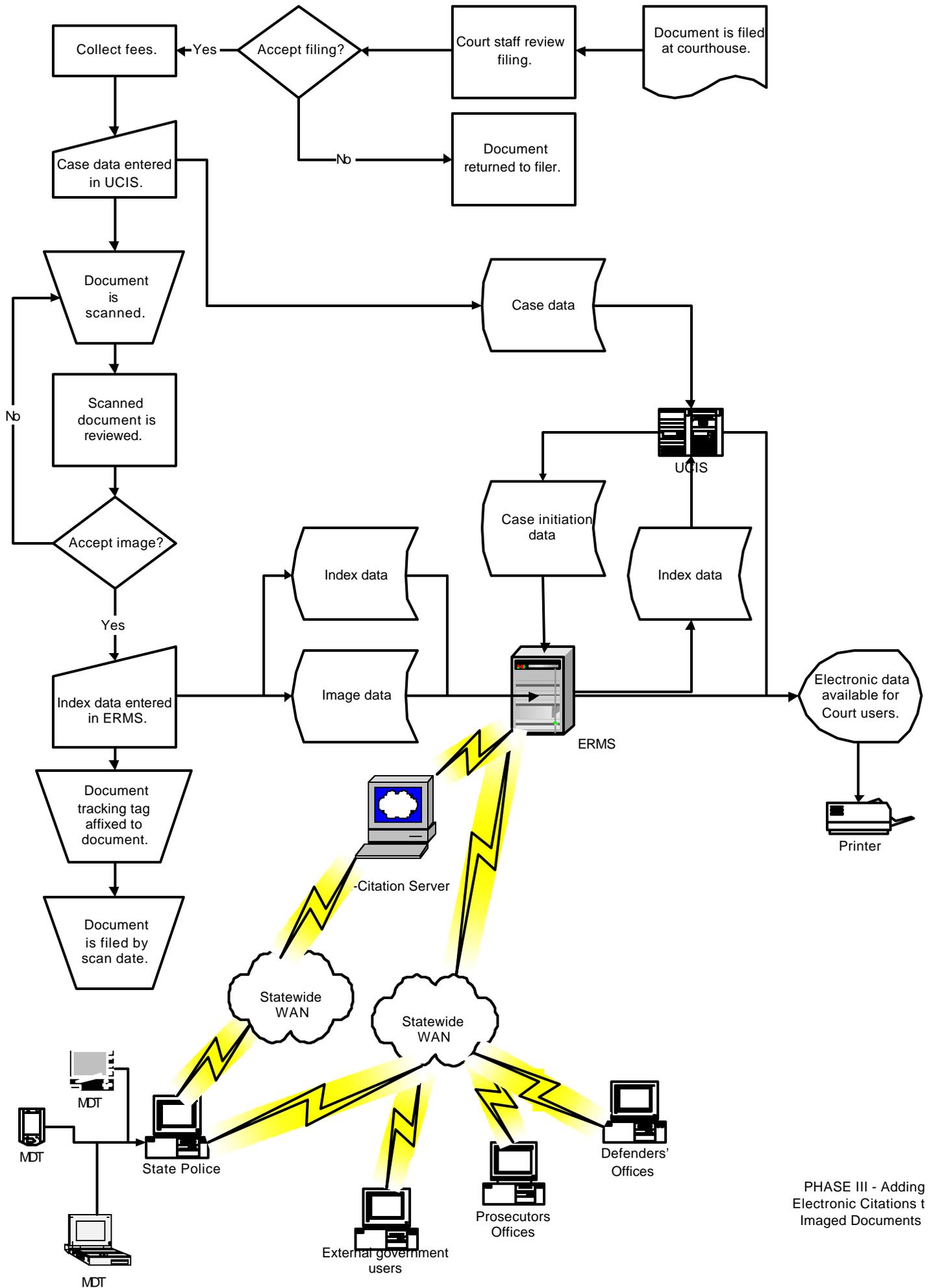




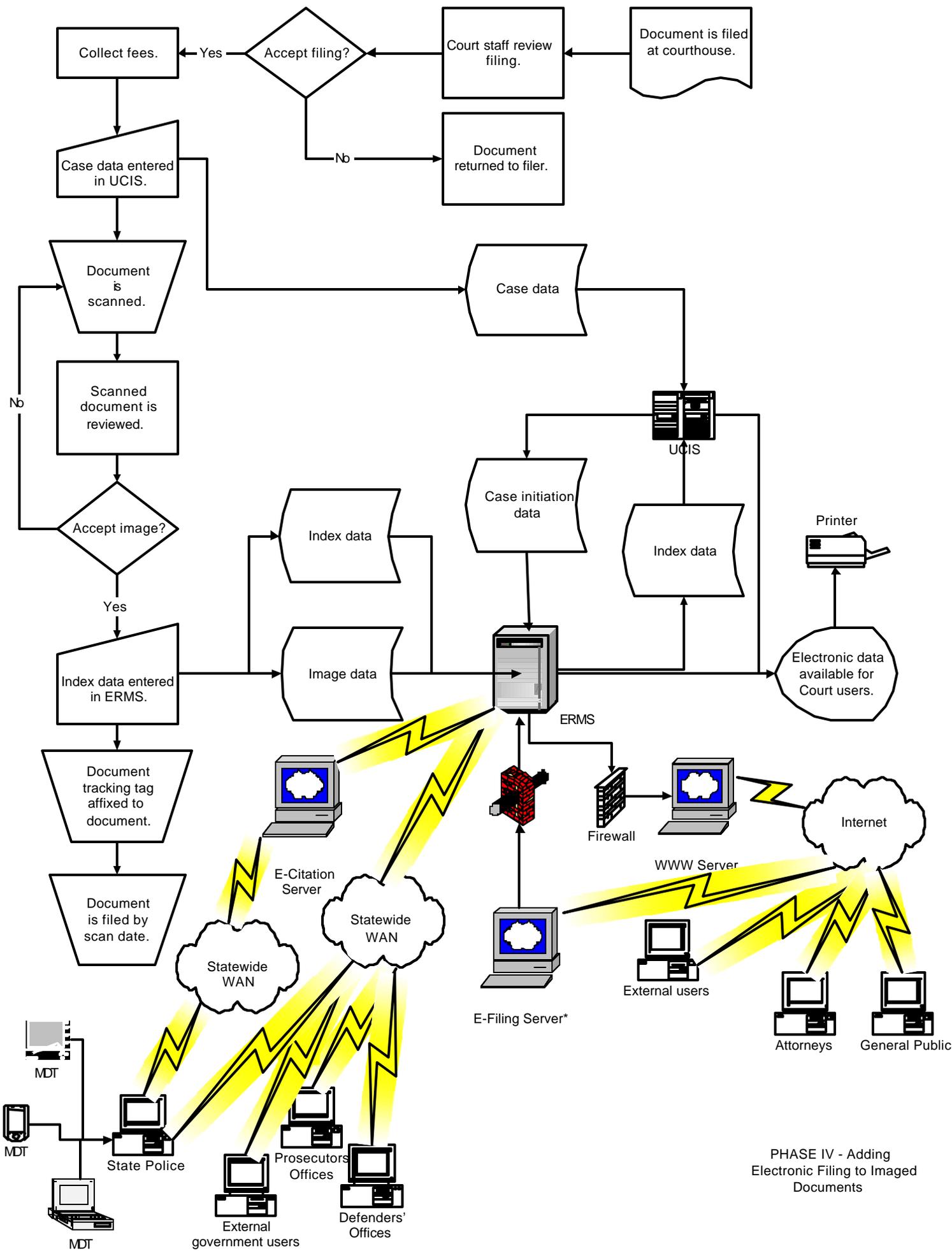
APPENDIX D

Logical Representation of the Phased Implementation of the ERMS

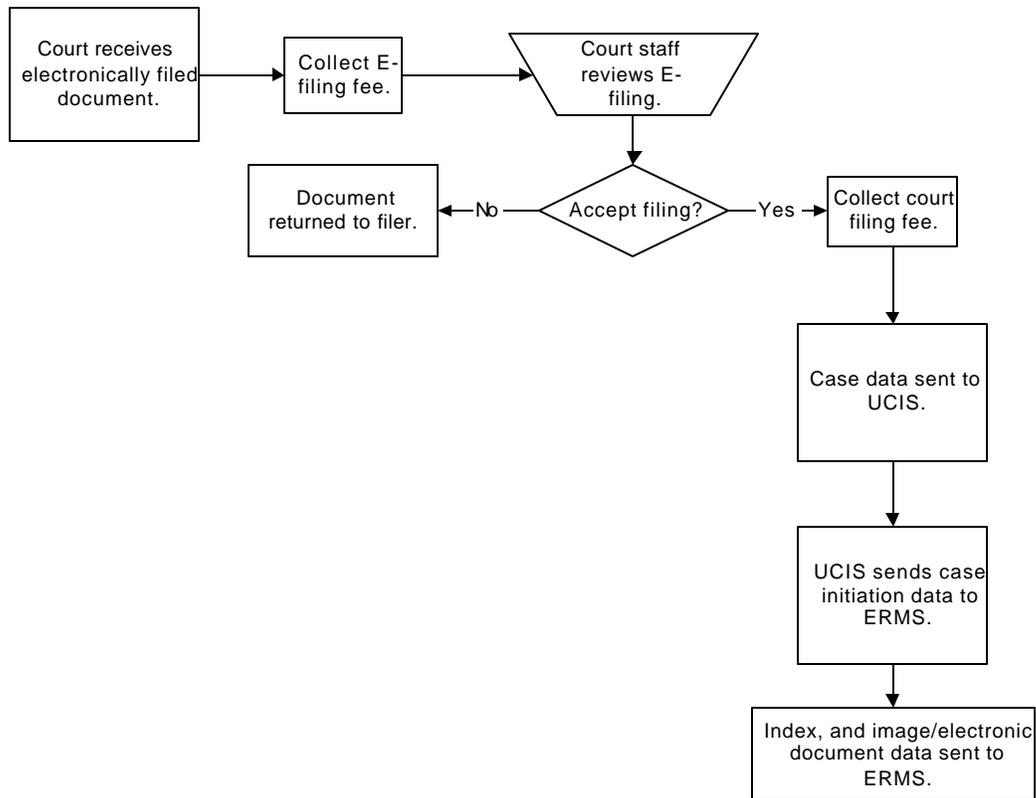




PHASE III - Adding Electronic Citations to Imaged Documents



PHASE IV - Adding Electronic Filing to Imaged Documents

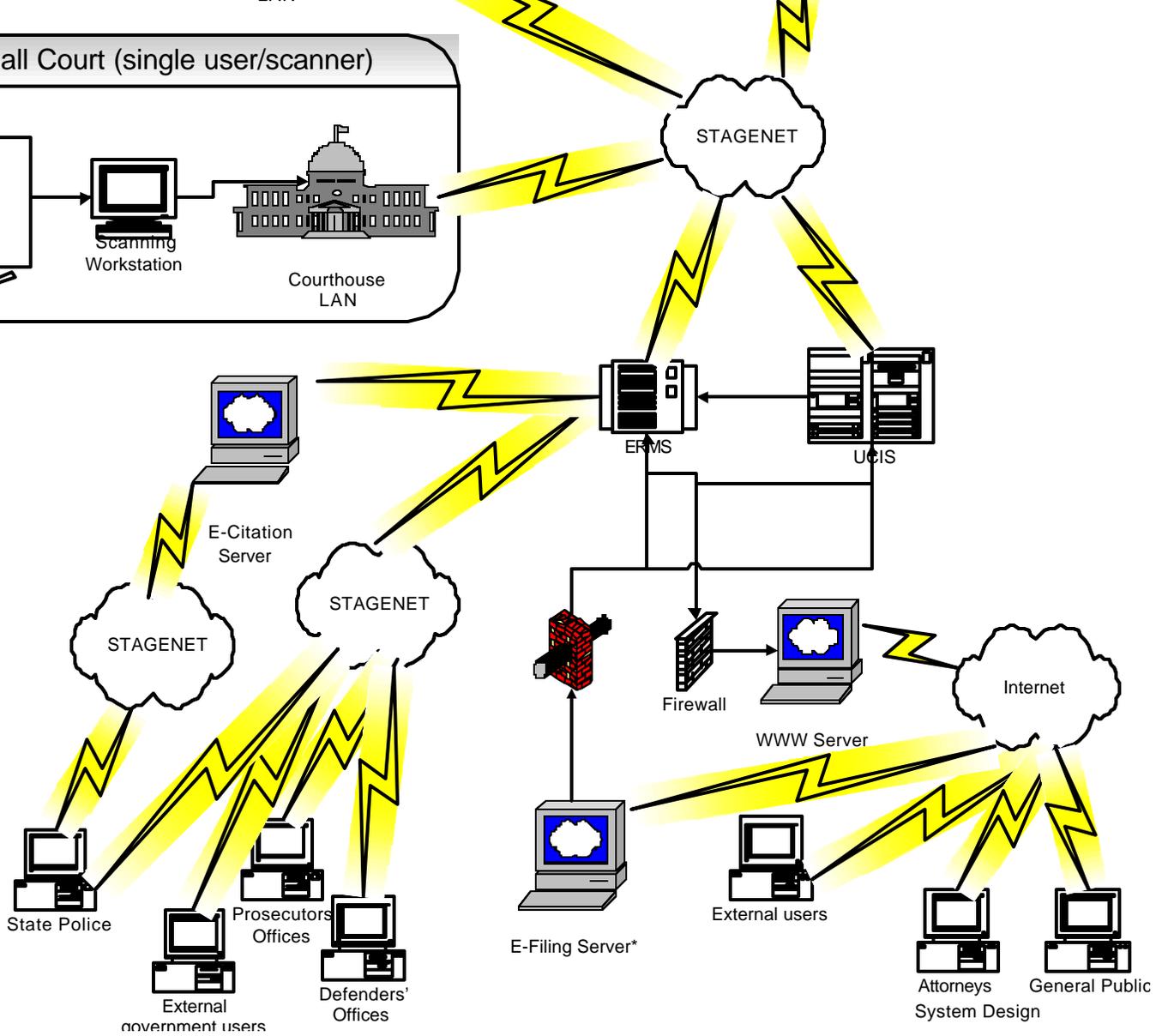
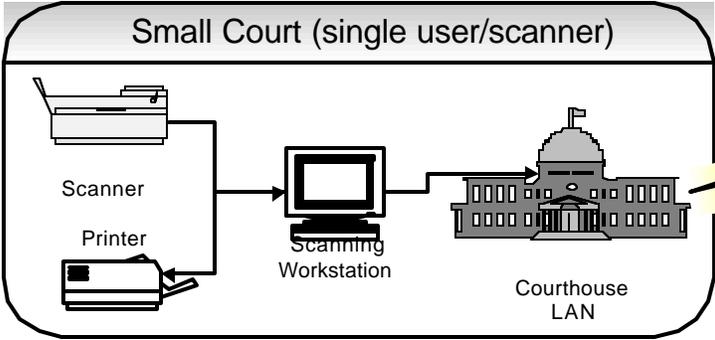
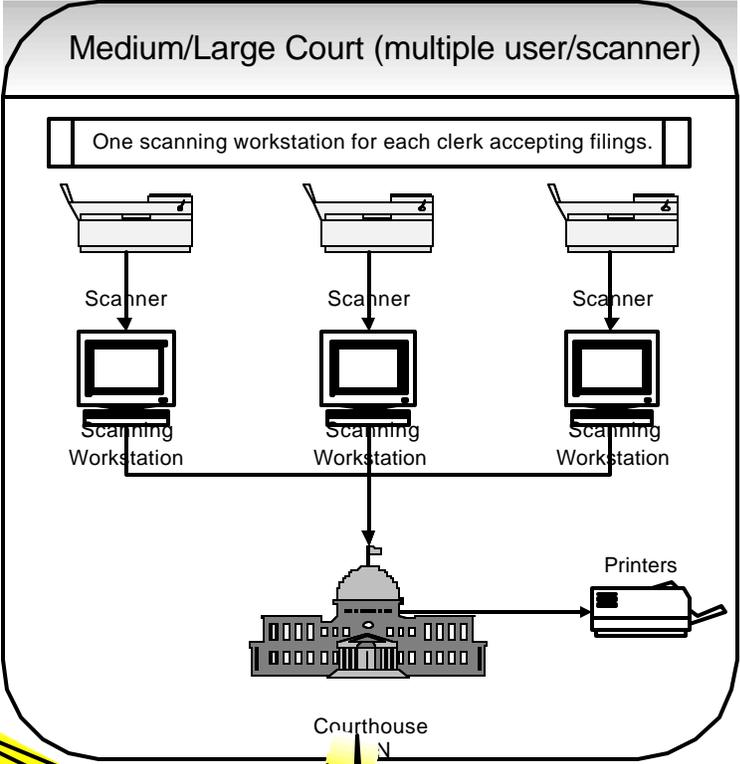
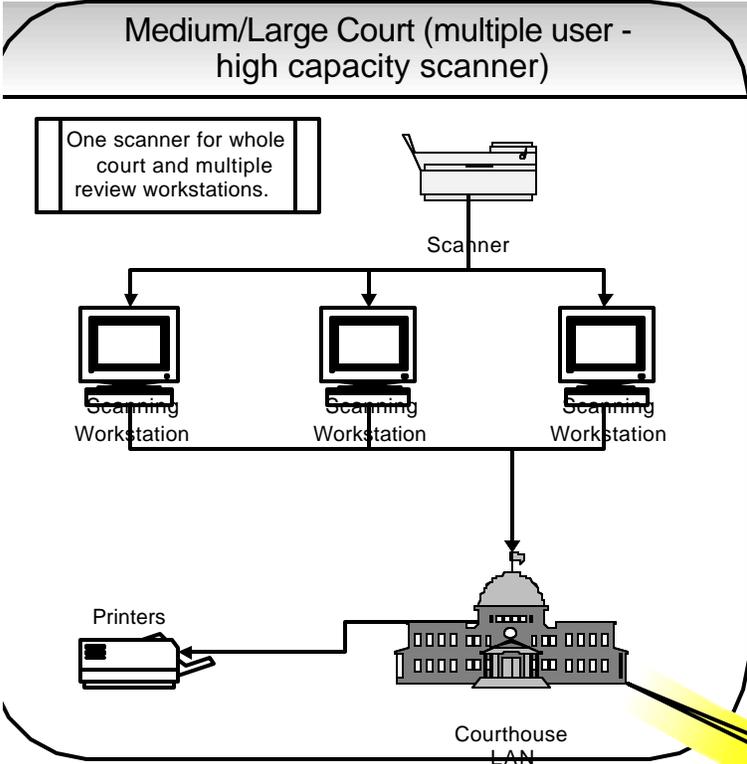


APPENDIX E

Enhanced Records Management System

ERMS - Estimated Costs

	Estimated Cost Range		SCAO	Large Courts	Medium Courts	Small Courts	Total Items	Estimated Total Cost Range	
Imaging System	\$350,000	\$600,000	1				1	\$350,000	\$600,000
Modifications	\$50,000	\$100,000	1				1	\$50,000	\$100,000
Middleware	\$25,000	\$100,000	1				1	\$25,000	\$100,000
Workstations (each)	\$1,000	\$1,500	1	16	18	40	75	\$75,000	\$112,500
Scanners (each)									
High volume	\$2,500	\$20,000		2			2	\$5,000	\$40,000
Low volume	\$500	\$1,000	1	12	18	40	71	\$35,500	\$71,000
Servers	\$8,000	\$150,000	4				4	\$32,000	\$600,000
Storage									
Optical (jukebox)	\$60,000	\$100,000	1				1	\$60,000	\$100,000
NAS	\$10,000	\$20,000	1				1	\$10,000	\$20,000
SAN	\$50,000	\$125,000					0	\$0	\$0
Training	\$30,000	\$100,000	1				1	\$30,000	\$100,000
Total Estimated ERMS Cost								\$672,500	\$1,843,500



2002 Filings	Civil	Criminal	Traffic	Juvenile	Total	Daily Case Load	Page Estimate (Cases * 10)	Minutes (15 Pages/Minute)	Page Review Effort in Hours (2 Pages/Minute)	Annual Pages	GB of Storage	GB of Storage for 5 YR	Estimated Caseload Increase	
Cass	7876	4736	12207	633	25452	97.9	-978.9	-65.3	-8.2	Large	-254520	-12.73	-67.56	3%
Grand Forks	3265	3585	7660	377	14887	57.3	572.6	38.2	4.8	Big	148870	7.44	39.52	3%
Burleigh	3352	2567	7741	221	13881	53.4	533.9	35.6	4.4		138810	6.94	36.85	3%
Ward	3103	2706	4220	140	10169	39.1	391.1	26.1	3.3		101690	5.08	26.99	3%
Stutsman	1461	1165	4889	103	7618	29.3	293.0	19.5	2.4	Medium	76180	3.81	20.22	3%
Morton	1491	1363	3858	86	6798	26.1	261.5	17.4	2.2		67980	3.40	18.05	3%
Ramsey	800	1478	4185	180	6643	25.6	255.5	17.0	2.1		66430	3.32	17.63	3%
Richland	914	1127	4443	52	6536	25.1	251.4	16.8	2.1		65360	3.27	17.35	3%
Stark	1045	1701	3244	93	6083	23.4	234.0	15.6	1.9		60830	3.04	16.15	3%
Williams	1212	1000	3380	62	5654	21.7	217.5	14.5	1.8		56540	2.83	15.01	3%
Barnes	601	783	3379	37	4800	18.5	184.6	12.3	1.5		48000	2.40	12.74	3%
McLean	333	474	3691	3	4501	17.3	173.1	11.5	1.4		45010	2.25	11.95	3%
Walsh	636	790	2922	35	4383	16.9	168.6	11.2	1.4		43830	2.19	11.63	3%
LaMoure	163	204	2252	8	2627	10.1	101.0	6.7	0.8	Small	26270	1.31	6.97	3%
Pembina	404	477	1661	30	2572	9.9	98.9	6.6	0.8		25720	1.29	6.83	3%
McKenzie	224	251	1536	7	2018	7.8	77.6	5.2	0.6		20180	1.01	5.36	3%
Bottineau	395	448	1142	22	2007	7.7	77.2	5.1	0.6		20070	1.00	5.33	3%
Rolette	511	598	807	38	1954	7.5	75.2	5.0	0.6		19540	0.98	5.19	3%
Traill	354	439	1047	24	1864	7.2	71.7	4.8	0.6		18640	0.93	4.95	3%
Mountrail	259	285	1077	11	1632	6.3	62.8	4.2	0.5		16320	0.82	4.33	3%
Kidder	157	113	1188	3	1461	5.6	56.2	3.7	0.5		14610	0.73	3.88	3%
Dickey	245	174	1028	6	1453	5.6	55.9	3.7	0.5		14530	0.73	3.86	3%
Ransom	286	290	861	4	1441	5.5	55.4	3.7	0.5		14410	0.72	3.83	3%
Mercer	301	368	612	20	1301	5.0	50.0	3.3	0.4		13010	0.65	3.45	3%
McHenry	210	252	825	12	1299	5.0	50.0	3.3	0.4		12990	0.65	3.45	3%

2002 Filings	Civil	Criminal	Traffic	Juvenile	Total	Daily Case Load	Page Estimate (Cases * 10)	Minutes (15 Pages/Minute)	Page Review Effort in Hours (2 Pages/Minute)	Annual Pages	GB of Storage	GB of Storage for 5 YR	Estimated Caseload Increase
Pierce	350	257	540	5	1152	4.4	44.3	3.0	0.4	11520	0.58	3.06	3%
Benson	211	206	660	23	1100	4.2	42.3	2.8	0.4	11000	0.55	2.92	3%
Dunn	116	179	791	9	1095	4.2	42.1	2.8	0.4	10950	0.55	2.91	3%
Cavalier	189	198	579	11	977	3.8	37.6	2.5	0.3	9770	0.49	2.59	3%
Wells	209	229	436	8	882	3.4	33.9	2.3	0.3	8820	0.44	2.34	3%
Nelson	139	136	558	1	834	3.2	32.1	2.1	0.3	8340	0.42	2.21	3%
Foster	168	148	474	5	795	3.1	30.6	2.0	0.3	7950	0.40	2.11	3%
Emmons	173	109	487	6	775	3.0	29.8	2.0	0.2	7750	0.39	2.06	3%
Bowman	139	132	485	2	758	2.9	29.2	1.9	0.2	7580	0.38	2.01	3%
Golden Valley	64	105	542	10	721	2.8	27.7	1.8	0.2	7210	0.36	1.91	3%
Towner	135	134	421	13	703	2.7	27.0	1.8	0.2	7030	0.35	1.87	3%
Sargent	206	166	307	5	684	2.6	26.3	1.8	0.2	6840	0.34	1.82	3%
Eddy	110	215	350	7	682	2.6	26.2	1.7	0.2	6820	0.34	1.81	3%
Adams	144	115	399	8	666	2.6	25.6	1.7	0.2	6660	0.33	1.77	3%
McIntosh	118	70	369	3	560	2.2	21.5	1.4	0.2	5600	0.28	1.49	3%
Burke	105	165	287	1	558	2.1	21.5	1.4	0.2	5580	0.28	1.48	3%
Billings	18	67	468	0	553	2.1	21.3	1.4	0.2	5530	0.28	1.47	3%
Steele	49	138	307	3	497	1.9	19.1	1.3	0.2	4970	0.25	1.32	3%
Renville	120	73	284	10	487	1.9	18.7	1.2	0.2	4870	0.24	1.29	3%
Grant	66	56	360	4	486	1.9	18.7	1.2	0.2	4860	0.24	1.29	3%
Hettinger	82	41	332	7	462	1.8	17.8	1.2	0.1	4620	0.23	1.23	3%
Griggs	138	127	174	1	440	1.7	16.9	1.1	0.1	4400	0.22	1.17	3%
Divide	86	77	273	2	438	1.7	16.8	1.1	0.1	4380	0.22	1.16	3%
Slope	19	28	301	0	348	1.3	13.4	0.9	0.1	3480	0.17	0.92	3%
Logan	56	50	183	0	289	1.1	11.1	0.7	0.1	2890	0.14	0.77	3%

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Oliver	59	69	141	4	273	1.1	10.5	0.7	0.1	2730	0.14	0.72	3%
Sioux	59	29	81	0	169	0.7	6.5	0.4	0.1	1690	0.08	0.45	3%
Sheridan	61	14	25	3	103	0.4	4.0	0.3	0.0	1030	0.05	0.27	3%
GRAND TOTALS	32,987	30,707	90,469	2,358	156,521	602.0	6020.0	401.3	50.2	1,565,210	78.26	415.50	3%

