

FEASIBILITY REVIEW OF THE
ELECTRONIC DOCUMENT MANAGEMENT
SYSTEM
for the
IOWA JUDICIAL BRANCH

Final Report
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EXECUTIVE SUMMARY

The National Center for State Courts (NCSC) conducted a review of a feasibility study done for the Iowa Judicial Branch by Digital Data Resources, Inc. (DDR) in 1999. The subject of the feasibility study was the Electronic Document Management System (EDMS), a new application that would create a nearly paperless environment for the Iowa courts.

The review consisted of five areas and this report is organized under those headings:

- Applicability of the EDMS Feasibility Study
- Options for Implementation of the EDMS
- Coordination of the EDMS with the Integrated Justice Initiative
- Information Technology (IT) Architecture Review and Recommendations
- EDMS Request for Proposals

In general terms, the feasibility study reflects the state of technology and what was known about document management systems at the time it was done. Since then, much has changed, most of which results in improved speed, reliability, and capacity of the system at a lower cost. Unfortunately, the feasibility study did not cover some issues that are essential to the success of the project. This report will fill in some of those gaps.

A. Applicability of the EDMS Feasibility Study

The study provides an adequate description of the EDMS project. It does not address managerial and operational feasibility directly, but this does not seem to be an issue because of the soundness of judicial branch organization and management. The study minimizes operational issues that must be addressed. It does not provide a realistic picture of the magnitude of change the EDMS will bring to how the work of the courts is done. It oversells the value of the technology at the expense of addressing how the system will help solve business problems in the courts. It does not provide input into two key points that were the cause of failure of some of the early electronic filing projects in the United States: (1) inadequate planning, training, and assistance for those who will use the system—the external customers and (2) the inability of the court to work with electronic documents. The 1999 study provided a framework for the analysis of the financial feasibility of the project, but it offered no data. Potential risks were ignored or understated. With experience gained in the last six years, the Iowa Judicial Branch is in a much better position to plan, implement, and operate an electronic document management system.

B. Options for Implementation of the EDMS

Because of the scope and magnitude of change that will occur in the Iowa Judicial Branch, the EDMS project cannot be managed as a technology project, it must be considered a court-wide project. Work must be done at the policy, operational, and technical levels. Judges and staff must be involved to ensure a smooth implementation.

The first important step in this process is the creation of a plan by judicial branch leaders. The plan should make a business case for the EDMS, primarily by outlining the business problems that the new application will solve. More thorough projections of system

capacity and network traffic are required to ensure that the new system will not be so sluggish that it alienates users. The involvement of outside users from the beginning of the project also should be a part of the plan. Planning realistically for a document scanning operation is also important. Finally, system support 24 hours per day, 365 days per year must be anticipated.

The EDMS project should be organized around business issues, rather than around technology issues. More standardization of work processes will be required for the EDMS implementation, but a limited amount of flexibility must be available. The federal model for electronic filing in the bankruptcy court also should be considered, to help smooth the process for attorneys with experience in this area.

There is an extensive list of policy issues that must be addressed. While some of this work must be done concurrently with system development as unanticipated issues arise, most of it should be done well in advance of system development. Otherwise, progress with business and technical issues will grind to a halt while policy issues are being addressed.

The EDMS must be designed primarily to support the work of judges. The hardware that they use, the workflow software that routes electronic documents to their desktops, and the underlying infrastructure that supports document processing and network routing must produce a system that is faster, easier, and better for judges.

C. Coordination of the EDMS with the Integrated Justice Initiative

Iowa is also in the midst of an integrated justice initiative that will require a great deal of energy and resources from the judicial branch. It is necessary to ensure that decisions made for both projects are complementary and do not create obstacles and ill will. It will be difficult, but possible to harmonize these efforts so that electronic data can flow freely along side of electronic documents.

D. IT Architecture Review and Recommendations

The EDMS effort must focus on system performance. If electronic case folders and documents cannot be delivered within seconds of a request, the project will fail. This will mean that the storage of documents must be simultaneously centralized and distributed – master copies on a central, redundant server, with copies cached on local computers.

There are a number of potential standards for storing electronic documents. The NCSC project consultants recommend portable document format (PDF), as implemented by the federal courts. It is clearly the best alternative available. Protection of documents, once they are filed with the court, also must be addressed.

As documents arrive at the court electronically, they must be accompanied by information about the document that will populate ICIS, the court's case management system (CMS). A web-based form is the preferred method of collecting this information, though several alternatives also must be provided.

Workflow software will route electronic documents through various work queues for processing. Some flexibility will be required in managing these work queues, to account

for differences in court operations, which are mainly dependent on the size of the operation.

E. The EDMS Request for Proposals

As a part of this project, the NCSC project consultants reviewed the EDMS request for proposals (RFP) that was prepared by the Iowa Judicial Branch in 2000. Numerous modifications of the RFP have been suggested in the body of the report, reflecting the issues explained in other sections of this report.

The Iowa Judicial Branch is well prepared to develop and implement an EDMS. It has competent staff resources, a supportive judicial organization, and an excellent case management system. This effort can be harmonized with the integrated justice initiative and both can succeed together.

Evolving technology makes the EDMS more practical today than it was in 1999. The technology issues are understood and can be managed. The areas of most concern relate to policy and business issues. Much work remains to be done in these areas.

INTRODUCTION

In August 2005, Larry Murphy, Director of Information Systems and Technology for the Iowa Judicial Branch, contacted the NCSC with a request for a review of a 1999 feasibility study for an electronic document management system. After a telephone conference call and several e-mail contacts, a proposal was prepared by NCSC staff for the project. After further discussion, the NCSC and Iowa Judicial Branch signed an agreement to proceed.

The work plan for the project consisted of three tasks: (1) background research and site visit planning, (2) a site visit, and (3) report preparation. The deliverable agreed upon was a report that would cover the following topics:

- IT architecture review and recommendations
- Issues related to the original feasibility study and its applicability in today's environment
- Options for implementation of the EDMS
- Coordination of the EDMS with the integrated justice initiative
- Construction of a new RFP, building upon the RFP created in 2000, modified to reflect changes in IT architecture in Iowa, advances in technology, the experience of other courts and organizations, and national work to develop standards and models to assist local efforts.

Lawrence P. Webster and James E. McMillan were assigned to the project.¹ They visited Des Moines on September 29 and 30, 2005 and met with numerous officials there. Teleconferences were held with several judges who play key roles in Iowa's technology efforts.

At the conclusion of the site visit, a debriefing was held with Larry Murphy and David Boyd, where tentative findings and recommendations for the project report were discussed. A telephone debriefing also was held with the technology committee on October 18.

This report draft was then prepared and submitted to the Iowa Judicial Branch for review.

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BACKGROUND

In 1999, a feasibility study for an EDMS was prepared for the Iowa Judicial Branch by Digital Data Resources, Inc. This lengthy publication is an in-depth study primarily of the technical feasibility of electronic document management. It includes a section on relevant statutes, rules, and court cases from other states, with little accompanying analysis. The following is an outline of this study:

- Justice for the Next Millennium
- EDMS Overview
- Counties of Study
- Feasibility of an EDMS in Iowa's Clerk of District Court
- Benefits
- Recommendations
 - Digital images and documents in a standard format (PDF)
 - E-mail to facilitate communication and effortless interaction between staff
 - Workflow software for automating routing of documents and a degree of standardization in decision making
 - The Internet and XML based web process including ICIS reports, schedules, and intra-dependent transference of data
 - Electronic forms for common transactions (PDF or Internet forms)
 - Electronic payment of filing or other fees (credit card, draw down/escrow account, or Electronic Data Interchange)
 - Enhanced ICIS abilities including image enabling of the Oracle database
 - Fax servers to both receive images electronically and to perform distribution tasks
 - Electronic record storage and retrieval instead of storing paper documents
- System operation and features
 - Data and document input: how information will get into the system
- Remaining paper issues
 - Standardization of forms
 - Cover pages for non-standard orders and other documents
 - Fax cover sheets designed and required by the state court administrator
 - Paper based registration form for all fax and electronic filers
- Internet access to the clerk's office
- Reports and other court related statistics on-line and up-to-date
- EDMS Diagram
- Recommended standards
- User interface and related
- Public terminals and kiosks

- External agencies
- How will judges use the EDMS and how will it benefit them
- Financial analysis and feasibility
- State map with counties and regional clusters identified
- Potential questions and concerns
- Public education and relations campaign
- In defense of the current system
- Legal issues and EDMS activities in other states

The Iowa Judicial Branch then prepared a RFP for a pilot implementation of the EDMS. The state was well along in the procurement process when funding issues forced them to withdraw the RFP. The funding situation has now improved sufficiently and the state is ready to proceed with this initiative. Judicial branch leaders felt it would be necessary to update the original feasibility study and RFP to reflect changes in available technology and in the environment in Iowa.

ANALYSIS AND RECOMMENDATIONS

In general, the 1999 feasibility study presented a good picture of technology that was available at that time to support an EDMS. In the last six years, much has changed. Today, technology to support this project has improved in capacity, speed, and reliability, and is available at a lower cost. The costs and risks associated with the project are now much lower, while the return and benefits remain high.

The 1999 feasibility study did not present a complete picture of the costs and risks associated with the implementation of an EDMS in Iowa. Many points made in the study have proven to be incorrect or irrelevant in the current environment. The goal of this review is to update the prior study and provide a complete, objective, and realistic picture of the feasibility of an EDMS in Iowa.

As agreed upon in the scope of work statement for the project, the body of this report contains five sections:

1. Applicability of the EDMS Feasibility Study
2. Options for Implementation of the EDMS
3. Coordination of the EDMS with the Integrated Justice Initiative
4. IT Architecture Review and Recommendations
5. EDMS Request for Proposals

Observations, findings, analysis, and recommendations for each category of information are included in the appropriate section of the report. In most cases, where a particular issue might be relevant to more than one category, it is covered only once. There are eleven total recommendations; one through five are included under *Options for Implementation of the EDMS*, and six through eleven are in *IT Architecture Review and Recommendations*.

A. Applicability of the EDMS Feasibility Study

This section of the report will analyze the DDR feasibility study, covering in detail several important issues that are significant to the success of the EDMS project. A number of other minor issues also will be listed at the end of the section; these are problems with the study that are probably obvious to those who are familiar with court operations in Iowa or who have kept pace with technological change over the past six years. In order to focus on the most important factors for success, no analysis of these minor issues will be presented.

To be complete, a feasibility study should contain certain essential elements. In addition, it should objectively review all aspects of the proposed project, showing both the positive and negative aspects of proceeding. The study should not be an attempt to sell an idea by focusing on benefits while ignoring the obstacles and risks associated with any technology endeavor. The following outline illustrates the organization of a typical feasibility study for a technology project in the judicial branch. The 1999 feasibility study then will be analyzed, using this outline.

- Project description
- Organizational and managerial feasibility

- Operational feasibility
- Technical feasibility
- Financial feasibility
- Conclusions
- Next steps

Project Description

The 1999 DDR feasibility study provides a good description of the proposed project. It covers the document management system and electronic filing at an appropriate level of detail, but the discussion of the integration of the case and document management systems is not strong. Workflow technology also is addressed, but the discussion is not sufficiently detailed to provide a clear picture of how it will work.

Organizational and Managerial Feasibility

Organizational and managerial feasibility is not addressed in the study. While there appears to be good support among judicial branch and state government leadership for the project, there are hints of the normal resistance from judges and court staff to major changes in ways of doing business. NCSC project consultants spoke with a few key individuals in the state and were unable to gauge the full extent of support throughout the organization that is expressed in the study. Court leadership does not appear to be concerned about internal and external support for the project, so this should not be a significant issue.

There are some major organizational impediments to the success of the EDMS. The fact that there are 99 counties in Iowa, mostly small and rural, is a cause for concern. Dealing with so many local officials and locations is a greater challenge than working with a smaller number of larger sites. An additional problem is that many key local officials, such as prosecutors, are not in full time positions, so their interest in and attention to working with the courts in new ways is not the same as it will be in larger counties. The organization of the state court system by judicial district will mitigate some of the internal problems, but the quality of relationships with local officials external to the judicial branch will be important to the success of the EDMS project.

Operational Feasibility

Electronic document management will introduce significant change into the way courts operate in Iowa. While ICIS is primarily a tool for *managing* the courts, the EDMS will be a tool for *operating* the courts. While judges and some clerical staff can perform their work with minimal contact with the case management system, this will not be true with the EDMS. The EDMS will change the way most tasks are performed by everyone involved in processing cases, including judges. Understanding the feasibility of new operational procedures is essential to making good decisions during the design and implementation. Unfortunately, the feasibility study did not adequately address how the work of judges will change.

The 1999 feasibility study opens with a vision statement of a technological nirvana that can be achieved when the EDMS is implemented. It gives the impression that the courts will be magically transformed — travel to courthouses by the public will become

unnecessary and most of the work of court employees will be eliminated. This approach to selling technology is as problematic as it is inaccurate.

Technology tools should be implemented to solve business problems. Rather than relying on the inherent value of technology, courts should focus on how technology, properly applied, can make interaction with courts simpler and more convenient for the public and make the work of the judicial branch more effective, productive, and economical. It would be better to describe the project in terms of the problems that exist in the judicial branch and how these technology tools can eliminate them or reduce their impact. A business case should be built for implementation of the technology. From the articulation of business problems, the definition of performance metrics, showing how success will be measured will follow.

The 1999 feasibility study should have done a better job of articulating a business case for the EDMS, but court leaders in Iowa do have a general understanding of the business problems that are being addressed. By being clear about the operational benefits of the technology, judicial branch leadership will have an easier time convincing judges, rank and file court staff, legislators, and others of the value of the investment in an EDMS.

This being said, there are some serious operational obstacles that must be overcome for the project to succeed. In short, the EDMS will only be successful if two conditions are met: (1) attorneys and organizations transacting business with the court must be willing and able to provide and receive information in an electronic format and (2) courts must be able to use the information in an electronic form, rather than reverting to paper. There will always be paper in the courthouse, but there is a threshold at which converting to and from paper is not cost effective. Too much scanning and too much printing will quickly erase the operational and economic advantages of the system.

Experience in other states has shown that a stated willingness by the Bar to transact business with the court electronically does not always translate into participation in electronic filing. The Iowa courts should not take this participation for granted, but they should work diligently with court customers in planning, design, training, and implementation of new procedures and technologies on the user end.

Another significant issue is the willingness of judges to work with electronic documents. This is a very difficult issue because judges cannot be forced to do something that does not make sense to them. The technology must be designed for rapid access, easy reading, and annotation if it is to succeed with the judges.

The 1999 feasibility study claims that the EDMS will simplify court operations. It will not. Computer systems are more difficult to master than paper files. An EDMS will add a layer of complexity to working in the courts; and the judicial branch should begin the project with clear expectations that this is an issue that must be addressed.

Technical Feasibility

The 1999 feasibility study was strongest in describing the technical feasibility of the EDMS. In this regard, the NCSC project consultants agree with many of the recommendations of the report, with exceptions noted as recommendations in subsequent sections of this document. The study gave good coverage of document management and

electronic filing technologies, but was a little light on workflow and the interface between the case management system and the document management system.

The EDMS was technically feasible in 1999. Because of the rapidly maturing and improving technology, it is even more feasible in 2005. The power, speed, and reliability of most hardware components continue to improve, while costs decline. Network capabilities are also significantly better and software tools have become more sophisticated.

One major barrier to electronic document systems in 1999 was the cathode-ray tube (CRT) monitor. Reading large documents on those bulky devices was inconvenient and impractical. Today's liquid crystal display (LCD) monitors and tablet computers will make it more practical for judges and other staff to use electronic documents.

Financial Feasibility

The financial feasibility section of the DDR study was most puzzling. After pages of description of methodology, the report provides no numbers. Perhaps the financial information is contained in separate studies for each of the five counties; but the report is unclear about this.

The cost of the installing the EDMS cannot be determined without an estimate of the volume of work that it will perform. Equipment and networks cannot be sized and support needs cannot be estimated without this important information. While ballpark numbers can be produced, they cannot be reliable.

Two studies of the document volume in pilot counties were provided to the project consultants. The studies provided some of the needed measures, but they were incomplete. This issue is discussed at length in the next section of this report.

Financial feasibility must consider costs that go beyond equipment acquisition, maintenance, and operation; support staffing needs; etc. The EDMS will save a considerable amount of labor in managing paper files, but some of these savings will be offset by new tasks that are introduced, such as scanning documents that the court will continue to receive and producing paper outputs for those who are not in a position to use electronic information. These new people and tasks are an important part of the equation.

Any study of financial feasibility also must consider non-quantitative costs and benefits of a project. Sometimes a particular system may not appear to be feasible from a purely quantitative perspective, but the non-quantitative benefits are so significant that they overcome a cost-benefit ratio that is not optimal.

The NCSC project consultants do not believe, from the materials that they reviewed, that a thorough study of financial feasibility has been conducted for the EDMS project. The NCSC project consultants share the belief of the original study that the project will prove to be financially feasible, but have insufficient data to validate this conclusion.

Conclusions

A major weakness of the 1999 study is that it makes several unsupported conclusions. For example, the report indicates that the district court is an excellent environment for the EDMS without providing sufficient data or analysis to support the conclusion. An

objective review should be required to weigh all the appropriate factors and provide reasoning for its results.

There is risk in any technology project. The NCSC project consultants believe that the most significant risks associated with the EDMS project in Iowa are in getting a critical mass of external users to send and receive electronic information to and from the court and in convincing a majority of judges and court staff to work with electronic case files. Too much scanning and too much printing will nullify most of the benefits of the EDMS. To ensure that this does not happen, more time and effort may be required for non-technical planning, analysis, and training than are currently envisioned.

Next Steps

The 1999 feasibility study does not provide a clear picture of how the courts should proceed in developing and implementing the EDMS. The NCSC project consultants have a number of thoughts and recommendations on this subject and they are included in this report.

Minor Issues

A number of minor issues that were apparent in the feasibility study are listed below. Either the issues that are addressed are obvious or the technology has changed sufficiently that discussion of these points is not necessary.

- Documents should be converted to PDF by the filer or sender, where possible – the court should never alter a document beyond affixing a date and time stamp.
- The court should acknowledge receipt of documents, not return (or fax) a copy to the sender – this would cause extra work for the court, delay for the filer, and other issues.
- A new cover sheet for faxes (and other forms of filing) probably should be developed through the court rules process, rather than by the state court administrator.
- Including information concerning attachments to be filed in an e-mail message is not a good idea, since the message is not saved in the case file – all information should be in the document and on the cover sheet.
- The court should not assume responsibility for service of process.
- Lengthy and complex login processes should not be required for filers, simple login identification (ID) and password should be sufficient.
- Public information about the court (and court forms) is not the same as case information and does not require the same level of encryption and security.
- Placing access points in libraries and other public buildings is not a good idea – who would provide assistance?
- Providing legal research capabilities to the public through court workstations is a questionable idea.
- Charging a fee for training on the EDMS is not a good idea.
- Providing printers for the public to use in preparing documents must be done very carefully.

- Discussion of XML is simplistic and inadequate.
- COLD reports are irrelevant, except perhaps for a limited amount of financial information.
- Adobe FrameMaker should not be a standard for the EDMS project.
- Document management and electronic filing should be integrated statewide as the study recommends, but case management, workflow, and IJIS also should be a part of the package.
- There are very few possible reasons for affixing bar codes to electronic documents.
- Optical character recognition is not a reliable technology for extracting case management data from document images.
- Spyware is not listed as an issue that must be addressed.
- Biometric security for external customers is not realistic.

B. Options for Implementation of the EDMS

Numerous important decisions must be made in planning for and design of the EDMS. Many of these choices are not technological in nature and must be addressed at the policy and business levels of the court organization. This section will discuss these options and how the Iowa Judicial Branch should organize itself to address them. There are five specific recommendations.

- EDMS must be managed as a court project, not as a technology project
- Develop a plan for the EDMS development
- Organize the EDMS initiative around business issues
- Begin work on policy issues immediately
- Design the EDMS first and foremost to support the work of judges

Recommendation 1: The EDMS must be managed as a court project, not as a technology project

Implementation of an electronic document management system, along with electronic filing and workflow, will fundamentally change the way the Iowa courts operate. Nearly every task that relates to case processing will be altered in some way. Judges, clerks, administrative staff, and other court employees must learn to use new tools and adapt to new processes that may not be comfortable to them at first. In order to assure maximum effectiveness of the new technology with minimal disruption of work processes, judicial branch personnel at every level must be involved in planning, design, and implementation of the new system. If court policy and business decisions are left to the technologists, the project is less likely to succeed.

Experience has taught that appropriate levels of engagement must be maintained in the governance of judicial branch technology. Policy leaders are responsible for policy decisions. Business people must work out business issues. Technologists are responsible for finding the best technological approaches. Problems arise when technologists are left to grapple with business or policy issues, when judges or court administrators prescribe technological solutions without the input of technology staff, or when personnel at any

level fail to participate. At the same time, it is important to coordinate efforts; the policy leaders, operational experts, and technologists must work together as a team.

Traditional court case management systems were created to help monitor and control court production activities: the adjudication of cases and related work. The court CMS is a tool that is used more by the presiding judge and court administrator than by judges working on individual cases. The CMS helps ensure that caseload, caseflow, and workload are managed at an optimal level, without too much concern for what is happening within each of the cases. The CMS also has evolved to become the primary record of all of the proceedings, decisions, and actions of the court.

Document management, electronic filing, and workflow systems are concerned more with the processing and resolution of cases than with court management. In this respect, these new technologies are very different from a case management system, although all of these tools should be tightly integrated. Judges and clerks will rely on them much more to do their work than they relied on the case management system. While judges could continue old ways of doing business with the implementation of a CMS, the same will not be true with the EDMS.

Because the document management and associated systems will have greater effect on the daily work activities of judges and other court staff, there is greater need for their participation and involvement in planning, design, and implementation. Policy leaders (judges and court administrators) should provide oversight and policy guidance, while judges and other court staff should be responsible for working out operational business issues. The technologists should offer assistance at every level, but are primarily responsible for implementing systems that meet the business needs of the court, as defined by others.

Recommendation 2: Develop a plan for the EDMS development

Planning is deciding what to do before it is time to do it. The plan should produce agreement about what is to be done, who is to do it, when it is to be done, how it is to be paid for, and what the deliverables will look like. Planning also addresses procurement, risk management, etc. In the end, a set of blueprints defining the product and a work plan defining the process for construction and deployment of the system will be produced.

The plan drives the development of the system, but it is also a marketing document to be used both within and outside of the judicial branch. Externally, the plan is used to secure and maintain adequate funding, to help convince attorneys to file their documents electronically, and to work out issues with other organization with which the courts exchange data. Internally, the plan is a tool used to communicate with and encourage the support of judges and court staff for the effort.

The business case for the EDMS

It is important that the plan articulates a business case for the project. It should clearly identify the business problems that will be addressed by the EDMS technology. For example, the court may be unable to move documents that are filed just before a scheduled hearing to the appropriate judge quickly enough, documents are being misfiled, retrieval times for case files is too slow, inordinate staff time is spent moving paper case files, etc. When these business problems can be quantified (e.g., case file

retrieval requires an average of four hours), they can be used to make a powerful case for improving productivity in the court, as well as for defining performance metrics for the project. An example of such a metric is: the average retrieval time for case files will be reduced from 4 hours to 10 seconds; the amount of staff time spent retrieving and re-filing case folders will be reduced from a 1.2 full-time equivalent (FTE) to 0 FTE; future storage space for courthouse records will be reduced by 50 percent in 5 years. These are terms that funding bodies and policy makers can understand and support.

The following is a list of some of the business problems that might exist in Iowa that could be included in the EDMS project plan:

- Judges cannot get case files quickly
- Only one individual can have a case file at any time—often a file is unavailable because someone else is using it
- As judges ride the circuit, they often do not have access to files housed in other courthouses
- Judges cannot find specific text in filed documents
- The court wastes valuable staff time locating, pulling, and re-filing case files
- Court staff spends inordinate amounts of time extracting information from documents and entering it into ICIS
- There is no paper trail for documents moving through the courthouse
- Newly filed documents do not always make their way into a case file in time for scheduled hearings
- There is not enough room in the courthouse to store paper files
- Case file materials are damaged by repeated access
- Case files and documents are lost, defaced, or stolen by the public
- Documents get lost while being passed from clerk to clerk
- Attorneys cannot get timely access to court materials
- Attorneys face high costs (printing and transporting) and unreliable service in filing documents with the court
- Delay in mail service adds days to case processing time at every step

Data analysis

The EDMS project design should be based on a thorough data analysis. The judicial branch cannot make accurate decisions about hardware performance, network bandwidth, and storage capacity without this information. The measures could include estimates of:

- How many documents (and pages) are filed daily with the court (by case type)
- How many documents (and pages) are produced daily by the court (by case type)
- What is the average size (in pages) of an active case file (by case type)
- What is the average size (in pages) of a closed case file (by case type)
- How many case files are retrieved daily
- How many cases (by case type) are active at any time

- How long is access to closed cases required (by case type)
- How many orders to seal or expunge cases are issued (by case type)

Some of this information is currently available for Polk and Scott counties, but additional work is required to project scanning volume, storage needs, and network traffic. The data also will be useful in reallocating staff when the new technology is implemented. The electronic filing guidebook contains average storage requirements for documents of different types, to assist planning efforts.²

Involving internal and external users

The success of electronic filing is dependent upon the answers to two questions: (1) are attorneys and other organizations prepared to file documents with the court electronically and (2) is the court ready to use electronic documents? If attorneys are not willing or able to file documents electronically, then the burden of scanning too much paper will quickly outweigh the benefits of an EDMS. Making assumptions about what attorneys would and could do was the main cause of failure in many early electronic filing projects. The EDMS will succeed only if a certain percentage of documents are filed electronically; scanning everything will not produce a favorable cost-benefit ratio. It is essential that the plan address marketing and training for the Bar.

If the court ends up printing and maintaining large numbers of paper documents for internal use, then the EDMS will not be cost effective and the court will simply become a print shop for the law firms, transferring the time and expense to its own budget.

The cost of scanning documents

Most sites embarking on electronic document systems or electronic filing have underestimated the cost and overestimated the capacity of scanning operations. Typically, they will project the volume of scanning that must be done on a daily basis, then find equipment and staff to work at that capacity. Experience has shown that the need to disassemble and reassemble documents adds a considerable amount of time to the process. Certain documents are on odd-sized paper, may have notes written in margins, may be printed on two sides, or are permanently bound. To address these issues (and to cover non-productive time devoted to staff meetings, leave, etc.) it is necessary to plan on about one-half of the rated capacity of the scanning hardware; in other words, it will be necessary to have twice the scanning capacity than is indicated by projected document filing volume. The courts should plan on at least one flatbed scanner for each location, in addition to the sheet feeder scanners that will be needed. It also would be helpful to have court representatives visit a court site with a mature, high-volume scanning operation, like Orange County, California or DuPage County, Illinois.

Once a site is up and running on the EDMS, it is expected that scanning volume will decrease as more and more attorneys and agencies provide documents in electronic form. As this occurs, it will be possible to move extra scanning equipment – and perhaps even staff – to new sites that are just starting up.

² Lawrence P. Webster, James E. McMillan, and J. Douglas Walker, *A Guidebook for Electronic Court Filing*, West Group, 1998.

Implications of 24 x 7 operations

The implementation of electronic filing offers opportunities for parties to transact business with the court over the Internet and to file documents at any time during the day or night. The move to integrated justice also creates opportunities for justice system agencies to access information, e.g., warrant and protection order data, during the evening and on weekends. There are numerous policy, operational, and financial issues associated with maintaining a 24 x 7 operation, including staff support during non-business hours (type, number, and location), filing deadlines, responding to business and technical questions after hours, etc. These are important project benefits, but thorough planning is necessary to ensure that unanticipated problems or resource shortages do not occur.

Planning for system problems

The EDMS plan should address how operational processes will proceed when system problems occur. It is inevitable that the new systems will not be available 100 percent of the time. Downtime cannot be eliminated, but its affects can be minimized with good planning and design.

Courts deal with other issues that can delay or shut down operations: power outages, bomb scares, fire alarms, bad weather, sickness, etc. The same kinds of procedures should be used when system problems prohibit access to case files.

Other issues to be addressed by the plan

Here are some other issues that might be considered during the planning process:

- Support resources
- Training
- System startup, data conversion, and parallel operation
- Increased need to provide assistance to pro se parties

It is clear that the EDMS provides great opportunities for the Iowa Judicial Branch to improve its operations; provide better service to the public; and eliminate redundant, unnecessary work. It is also clear that there are numerous issues that must be anticipated and addressed in a planning process to make a smooth transition from a paper environment to the digital world.

Recommendation 3: Organize the EDMS initiative around business issues

For technologists, the value of a new technology is inherent. For court leaders, its value is in how it solves business problems. Technology offers tremendous tools for improving operational performance, but often the focus is on the capabilities of the tools, rather than on the problem that must be solved. Court leaders and technologists must work together in applying technology to business problems, recognizing the capabilities and limitations of the available tools.

The implementation of standard tools in the court environment has the effect of standardizing the way work must be performed. This standardization can increase the productivity and effectiveness of the judicial branch, while reducing operational costs, as long the new business processes are carefully designed and take advantage of best practices from the various county environments and the capabilities of the technology

tools. This means that effective technology implementation is dependent upon the quality of communication and interaction between county-based court staff and state-level employees. It also means that every major technology project might also be considered an exercise in business process reengineering.³

There are legitimate differences between court operations that must not be ignored. As the volume of work increases, operational processes are broken into smaller pieces and more specialized staff can perform more work at a lower cost. This *assembly line* approach to organizing work has existed since the beginning of modern management and has proven, in most practical applications, to be superior to other alternatives. This means that large courts should organize their work differently than small courts to maximize their productivity. It also means that the tools that are needed to perform these more specialized operations must be different than those used in smaller, more rural environments. The main implication for the EDMS project is that the workflow systems that are put in place must be flexible and under the control (to a limited degree) of the local court or district. A one-size-fits-all approach will not produce an optimal solution.

In designing the user interface for electronic filing, the court should be aware that many attorneys practice in the federal bankruptcy court, where electronic filing is mandatory. Those who design the electronic filing interface should be familiar with this bankruptcy court interface, and to the maximum extent possible, should use consistent vocabulary and procedures. This will make it easier for attorneys and their staff to adapt to electronic filing in the state court system.

Recommendation 4: Begin work on policy issues immediately

Ideally, policy issues should be resolved before, rather than during the EDMS development effort. At crucial points in the process, technological development may be halted or delayed while policy leaders resolve important problems. Work on these issues in Iowa is only just beginning, so it will be necessary to accelerate the process.

Court rules govern the operational procedures of the judicial branch. These rules are intended to provide consistency, stability, and efficiency to court operations, and not to serve as obstacles to better ways of doing business. But they were developed in a time when the available tools were much different than they are today. In order to take advantage of emerging technology tools, courts must constantly review the rules that guide their operations. The changes associated with the implementation of an EDMS will be of greater magnitude than those for any other new technology that has been implemented in the past. Significant and fundamental changes in business practices must be made to exploit these new tools. It is a tremendous opportunity for judicial branch operations to be more effective, productive, and economical, but there is also great risk of upsetting traditional balances, work allocations, and organizational roles in the justice system. Changes to court rules must be made carefully and deliberately.

Maintaining the balance between individual privacy, confidentiality of investigative and deliberative processes, and the public's right to access information is an excellent example. Although paper files in courthouses are individually accessible, their *practical obscurity* may become lost as Internet searches provide bulk accessibility in fractions of

³ The NCSC can provide materials on business process reengineering, if needed.

seconds from any location in the world, threatening individual privacy. Clearly the application of old rules to these new technologies is not sufficient.

Court rules must have a thorough review in preparation for the EDMS. Some sample questions that the Iowa judiciary must consider include:

- How will service of process change?
- Can court hours for accepting filings be expanded to 24 by 7?
- What about physical time stamps and signatures on documents?
- Can an electronic case file be the official court record?
- Is an image of a document that has evidentiary value sufficient, or must the original paper be produced?
- How will fees be collected when litigants file electronically?
- What electronic formats of documents are acceptable?
- How will the court handle changes in base technologies (such as new versions of software) next year and the year after?
- Can cover sheets be required on documents to isolate case management data for the court?
- Are the paper, fax, web, image, and XML versions of these cover sheets equivalent?
- Will the need for structured case management system data be reduced as the entire file becomes available electronically?

These are only a few of the many issues that must be addressed. Appendix B, Policy Issues from Guidebook, contains a more complete list of policy issues that have been addressed in other states. While this list is not exhaustive, it is a good starting point for policy-level discussions in Iowa.

Recommendation 5: Design the EDMS first and foremost to support the work of judges

Judges and their staffs are primary users of court case files. Until recently, technology was a barrier to implementation of document management systems for the simple reason that it is not comfortable or practical to read lengthy documents on a CRT monitor. The advent of tablet computers and wireless network connectivity has nearly resolved this problem.⁴ A judge can now hold all of his or her cases on a laptop computer. He or she can change positions and move around while reading, just as with a paper file. It is a simple matter to highlight text or to attach annotations with virtual yellow sticky notes. Although the tablet computer still requires some refinement, it is ready for use by judges who are willing to invest some time and energy in learning to use it.

Another issue is access time. Judges who have worked with imaging systems have complained about a 20-second retrieval time for documents and a 2-second delay in turning pages. Considering the fact that it may have required hours to have a file folder retrieved from the records room in the past, this may seem like a minor delay. But in the past, the judge was not sitting still, doing nothing while waiting. If the EDMS cannot

⁴ A tablet computer is roughly the size of a laptop in the closed position, with the screen on the outside. According to Colorado court officials, these devices have helped judges there accept electronic document filing.

offer quick access to documents, judges will not embrace it. To paraphrase the words of one judge, the EDMS must be simpler, faster, and better than the current system.

Where monitors are used for viewing documents, they must be large, have a high resolution, and have excellent quality. Working with these devices for long periods of time can cause eye, neck, and back strain, and can hurt productivity if they don't meet these standards and are not correctly placed.

An electronic case file must provide the capability of capturing annotations from the judge. The current technology allows for underlining, highlighting, placing notes, and even writing on a virtual legal pad and storing the pages in the case file. As attorneys and members of the public will be accessing the same folder, the judge should have the option of restricting access to personal notes that he or she makes in a case file. Fortunately, current technology also makes this possible.

Judges have expressed the desire to be able to access case materials from home. If this involves dialing in to a server, response time may not be adequate for displaying documents because dial up lines are too slow. Fortunately, a judge's cases can be cached on a tablet or laptop computer, providing access to all be the most recently filed documents at any location.

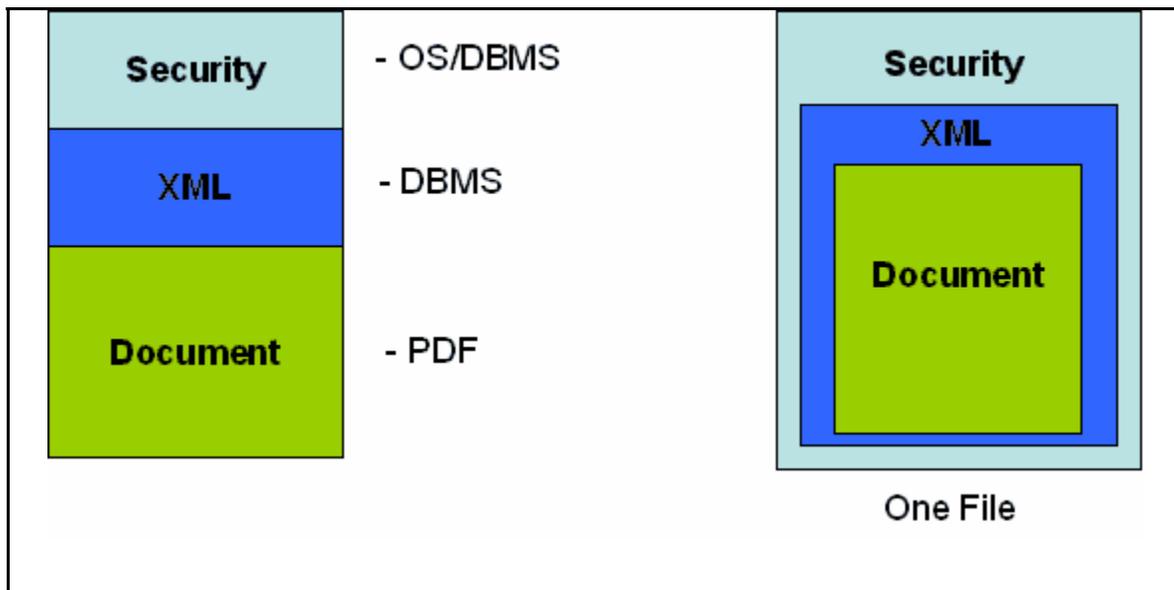
C. Coordination of the EDMS with the Integrated Justice Initiative

Iowa officials are aware of the concurrent need to support the EDMS project and an integrated justice initiative. While the EDMS focuses on presenting physical documents in an electronic form, the IJIS initiative is focused on replacing physical documents with an XML representation of important data from the document. XML, in theory, provides the capability to tag specific data elements within a traditional document, but it has structural limitations that prevent this from occurring in the real world.⁵ XML is better used as a tool to pass structured data from one case management system to another.

EDMS will support a variety of formats, from straight text to images. It is recommended that these formats be represented in portable document format. XML can be rendered with a style sheet to look like a traditional document. This document could then be saved in a PDF format and stored in the EDMS. The court would require a filer to provide a style sheet that rendered the XML file in a manner consistent with court rules for documents (length, margins, fonts, etc.). This approach would satisfy both needs: to create a document image for the EDMS and to capture data from the XML document to place in ICIS.

⁵ For example, XML tags can be placed around pages of information, and around individual paragraphs within a page, but XML does not allow a paragraph to span two pages. The tag structure in XML is hierarchical, which is a severe limitation for representing text documents.

Figure 1: Document Packaging Options



As illustrated (Figure 1), in an XML environment a document representation can be included within the XML file, or be associated with it, while remaining separate. An issue that the Iowa IJIS effort must address is how this representation will occur and how this will meet the needs of the EDMS project.

D. IT Architecture Review and Recommendations

This section covers architectural and other technical issues that were apparent from the site visit. Specifically, there are six recommendations:

- Focus on system performance in the development of the EDMS
- The EDMS servers should be centralized to the maximum extent possible
- Adopt PDF as a standard for documents
- Consider Digital Rights Management (DRM) as a document protection technology
- Adopt web page technology for delivering electronic cover sheets
- Design flexibility into the workflow technology that is selected

Recommendation 6: Focus on system performance in the development of the EDMS

System performance is a key to the acceptance and success of the EDMS in Iowa. If documents do not appear on screens quickly enough, judges will not use the system and the investment will have been wasted. For this reason, it is essential to conduct pilot implementations to prove and refine the technology before deploying it statewide.

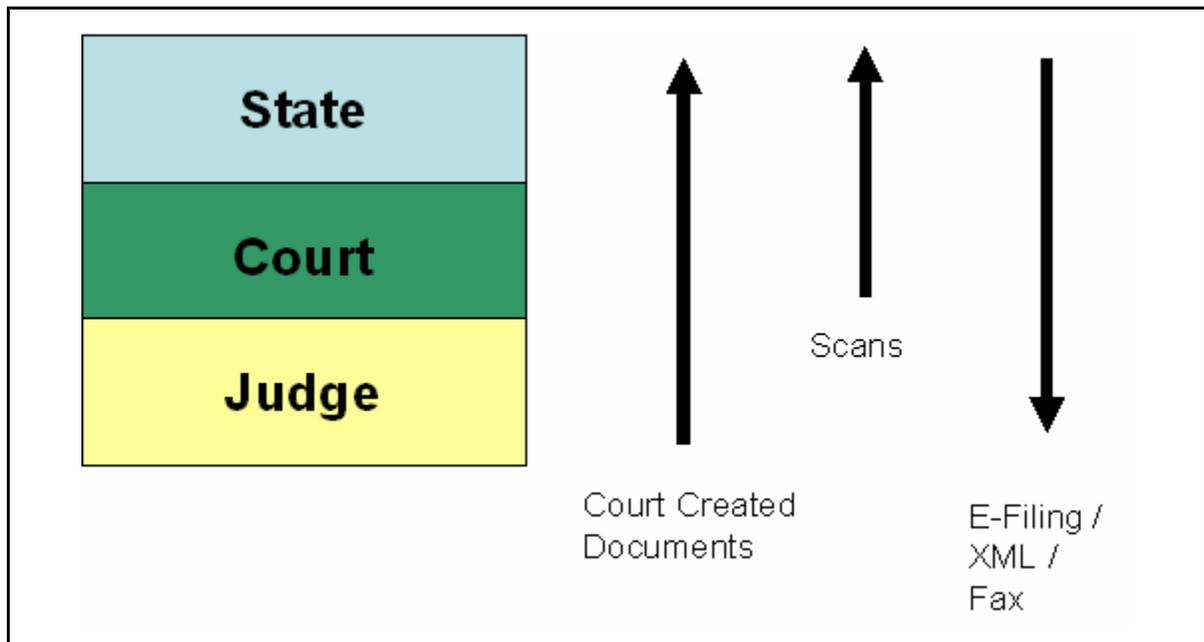
There are many factors that affect the performance of the system: the speed of the processors in the servers, the speed of the storage devices upon which the documents are stored, the quality of the interface between the document management system and the case management system that serves as an index to documents, the speed and capacity of

communications devices and networks, and the performance of local networks and devices. In addition to speed and capacity, reliability also is an issue that affects performance. The system must be able to continue operating if a hard drive or a server fails. Multiple communications paths must always be available.

There are two main strategies for providing adequate performance with the EDMS. One strategy is to decentralize operations and get servers as close to users as possible. The second is to centralize the operation and invest in the highest quality equipment available. The recommended approach combines the best features of both strategies and should provide the high quality service at an affordable price. This approach is to centralize the EDMS (with a mirrored site to ensure uninterrupted operation) and then to cache copies of electronic case folders in the appropriate judicial district and on the appropriate judge's computer. This way, judges can view files on their local machines, rather than depending on remote servers to provide access to documents.

When a new document is filed, it may take a few minutes for it to make its way into the appropriate caches in the network. Some will be moving from the central server down to individual PCs, while others are accepted locally and must move up to the central server. How quickly this process can work is an important question that must be answered in the pilot project.

Figure 2: Replication Paths



Regardless of the architecture of the system, there will be a tremendous amount of network traffic. It is important to ensure that every component of the system will be capable of handling the speed and the volume.

Recommendation 7: The EDMS servers should be centralized to the maximum extent possible

The architecture recommended in the feasibility study placed servers in the nine largest counties to support their operations, with four servers to support the other counties via

communications networks. The NCSC project consultants recommend that all the EDMS access through a communications network to a central location, if possible. This will minimize staffing and overhead costs to support the servers and make more funding available to improve the capability of networks to deliver documents quickly.

Whether larger counties will require their own servers to deliver adequate performance or rely instead on a centralized server can only be determined after an analysis of projected network traffic is completed and testing is conducted in pilot sites. Optimally, all documents should be stored in a central location and cached on local servers and on the tablet and laptop computers of the individual judges. More servers at more locations mean higher support and overhead costs and greater dilution of resources for everyone.

Recommendation 8: Adopt PDF as a standard for documents

There are a wide variety of document formats that could exist in an electronic document management system, including word processing, graphic image formats, or XML. Word processing formats tend to change often and are not always backward compatible. Graphic image formats consume large amounts of disk space and network bandwidth. XML is a standard for formatted data, one that most attorneys and government agencies are not yet prepared to support. Industry standard Portable Document Format, originally developed by Adobe, has emerged as a standard for electronic documents in the federal courts and in some state courts. It is a text format that can accommodate graphics, which makes it searchable and minimizes storage needs and communications capacity. Standard word processing documents are converted to PDF at the push of a button, at which point they can no longer be altered.

While PDF initially was developed as a proprietary product, it now is open and available to all vendors. Others are developing tools to make PDF formatting even simpler and faster. Over 1,200 software packages will generate PDF output and Microsoft will include support in its next release of Word. The federal courts are working with NIST and others to create a PDF archive standard, which will be known as PDF-A. The NCSC project consultants recommend that the Iowa Judicial Branch adopt PDF as a document standard for its EDMS. Adobe also has a different tool to create forms — the NCSC project consultants do not recommend the adoption of Adobe PDF forms as a standard, since there are superior alternatives that will be discussed.

With any standard there are issues of change. As time progresses, newer versions of PDF and other tools that are superior to today's technology will become available. At some point, today's PDF will be obsolete. Backward compatibility probably will exist for some time, but the Iowa Judicial Branch must be prepared to adapt to new standards in the future. This could include massive conversions of historical records.

Recommendation 9: Consider Digital Rights Management as a document protection technology

Document security is an important issue. In the paper world, it has always been possible for court records to be altered or destroyed, but procedures have been in place to correct these problems when they have occurred. In a digital environment, the same issues are present, but it may be more difficult to prevent, detect, and recover from such occurrences. Today's computer systems offer the ability to control access to documents on a system, but many of those protections are lost when the document moves to another

computer. The music and video industries have taken the lead in developing technologies to protect digital content, some of which can be applied to protect court records.

Adobe Acrobat version 7 provides many useful security options that may be relevant in Iowa. Document protection policies can be set to standardize security protocols. Acrobat 7 allows the user to:

- Limit printing
- Limit selection and copying of text
- Prevent users from signing a document
- Prevent users from filling in forms electronically
- Prohibit changes to the document
- Prohibit document splicing and merging
- Digitally sign a document
- Implement real-time authentication when the document is opened
- Prevent editing of only certain sections of a document

Digital Rights Management would keep document access information on a separate server, instead of with the document. That way, no one could access any protected document without the system verifying permissions with the DRM server. Juvenile, mental health, personal financial data, and other information could be protected from unauthorized access in this way.

Appendix C, Draft Whitepaper on DRM, contains a lengthy discussion of the document protection technology options that are available to the Iowa courts.

Recommendation 10: Adopt web page technology for delivering electronic cover sheets

There are a variety of options for filing documents with the courts with an EDMS and the Iowa Judicial Branch should take advantage of as many of these options as possible for the convenience of customers and to ensure high usage of electronic filing. These options include:

- Electronic mail with the document as an attachment
- Internet web forms where the document is uploaded to the server
- Scanning paper documents at the front counter of the courthouse
- Fax transmission of document
- XML transmissions from justice agencies in the near term and others in the longer term

In most of these scenarios, it is necessary for the filer to provide specific, formatted data elements to accompany a document. These elements are used to populate ICIS tables for indexing of the documents and other case management purposes. The cover sheet is the traditional way of collecting this information. With the implementation of the EDMS, it will be necessary to automate the process of getting cover sheet information into the case management system.

With electronic mail, the cover sheet could be a PDF document, an electronic form of some type, e.g., PDF form or Teleform, a text file, a scanned image of a paper cover sheet, or an XML document. A format that provides structured, edited data is preferred.

When an Internet web form is used, formatted data that is extracted from user input and edited by the system to ensure validity, would accompany the document. This approach also applies to information provided through a kiosk. The advantage of web forms is that they can be programmed to ask only relevant questions for the type of case and document that are being filed. A more traditional cover sheet contains elements that may not be appropriate in all circumstances. The web form can collect a small amount of data and then use that information to filter further input—the user is only required to supply data that is relevant for the case and document type.

For paper or faxed documents, the options for providing cover sheet information are more limited. A standard fill-in-the-blanks form can be used, with an option of using optical character recognition (OCR) technology to try to interpret it or a Teleform (fill-in-the-bubbles) that also can be machine interpretable.

XML documents have the advantage that they already identify structured data, so no cover sheet is necessary. Case management system entries can be made directly from this data.

The web form option is the best solution because it is simplest for the user and it provides the ability to edit data before submission. While multiple options must be made available, the web form should be used whenever possible.

Recommendation 11: Design flexibility into the workflow technology that is selected

Workflow technology moves electronic documents from location to location in the court and allows staff to perform the necessary functions. Workflow is essential to the success of the EDMS. Good workflow technology will streamline operations and allow documents that may have required hours or days to process in the past to be completed in minutes.

Iowa has courts that range from very large to very small. The way that work processes are organized in these locations varies to allow greater staff specialization in higher volume courts. The efficiency of the operation is dependent upon the ability of court leadership to exercise flexibility in the way that it assigns work to employees.

Courts must continually adjust staff assignments as employees take time off, attend training, participate in meetings, and receive special assignments. At a high level, it is important to maintain standard ways of conducting business, but the workflow software that is used must provide flexibility in rerouting document flow to adjust for changing conditions.

E. The EDMS Request for Proposals

The following comments relate to specific language in the 1999 RFP that should be reviewed and updated. The page number from the initial RFP is listed first, followed by the original RFP language (shaded and Arial font), and then the relevant comments.

Page 15:

- CD-ROM or other optical storage media for long term storage

It is now practical to store all documents on a magnetic disk.

Page 16:

For maximum feasibility, Iowa's nine (9) largest counties should be self-sufficient, possessing all hardware and software necessary to comprise a fully functional "stand-alone" EDMS. The nine counties that comprise our recommendation are:

- | | | |
|---------------|------------------|-------------|
| 1. Polk | 4. Johnson | 7. Linn |
| 2. Black Hawk | 5. Pottawattamie | 8. Scott |
| 3. Dubuque | 6. Story | 9. Woodbury |

The remaining ninety-one (91) Iowa counties should be split up into four regional "clusters," each sharing the hardware and software necessary to administer and operate a fully functional EDMS. We recommend the following regional clusters:

- | | |
|---------------------------------------|-------------------------------|
| 1. First, Sixth and Seventh Districts | 3. Third and Fourth Districts |
| 2. Second District | 4. Fifth and Eighth Districts |

To operate an EDMS it is necessary to maintain both an EDMS server and EDMS clients (users). It is not necessary however that they be in geographic proximity. Workload and specific needs of smaller counties can be effectively handled by large EDMS servers located at four multi-county administration locations. While the server and data storage functions would be in one location each county would be attached to the server via the ICN and would operate as a client. Not only does this method support rapid return on investment but allows for faster and more effective technical support - something already in great demand at the county level.

The NCSC project consultants have previously recommended that that state pursue a centralized solution, but that it remains open to providing servers in large counties if pilot testing shows that a centralized approach will not deliver acceptable retrieval times.

Page 22:

Access to standard forms and ABA forms if possible (Court may need to redesign some forms) as an Adobe PDF form or other more accessible format. See Appendix 6

The NCSC project consultants do not recommend Adobe PDF forms as a standard and believes that web forms are a superior alternative.

Page 23:

Electronic forms for common transactions (PDF or Internet forms).

Below you will find an image of a commonly used form and a PDF form of the same document. Note that they are very similar in appearance though the PDF form has "drop down" menus or boxes where the other has "blanks" to be manually filled in. The PDF form will allow the user to sit at any computer terminal and tab to each required field and accurately fill out the document. If a field is not completed correctly the system knows it and will reject the form and return it as not successfully filed. This forces some level of consistency and reduces the amount of data entry required by the Clerk.

The following page has a sample of what an electronic form might look like next to an image of the original form. Digital Data Resources, Inc. scanned the original form, converted the image (TIFF) to a PDF format (see section on Adobe PDF above) and then created an interactive form from the image. The process was relatively fast and easy. This is a process that could either be done by a vendor for a fee or internally by the Judicial Department. In either case, a committee should be established to design the forms and to ensure that any “select from a list of options” features contain all necessary options and that they are all accurate.

The NCSC project consultants do not recommend Adobe PDF forms as a standard and believes that web forms are a superior approach.

Page 24:

Paper delivered to the courthouse will be digitally imaged, or “scanned” upon receipt and a quick identification tag/index (possibly even as little as a sequential number) will be applied to the image by the individual running the scanner. The documents will be time and date stamped, much as they are today, prior to or during the scanning process. The original paper documents will be returned to the filing party directly after scanning if by hand or will be mailed back to the appropriate party (or opposing party if distribution is required) if received by mail to indicate proof of receipt.

The practice of returning documents to the filer is impractical and unnecessary. Documents should be placed in sequential order in a box after they are scanned and sent to an archive facility within a few days.

Page 26:

E-mail attachments are dealt with very similarly to a fax as described in “Item #2” as the clerk’s office will receive data that does not readily identify itself to the system and must be manually indexed and docketed by court staff. A benefit associated with this method is the sender’s ability to include a message or instructions to the court in the body of the accompanying e-mail message.

It is not a good idea to accept additional communication from a party in an e-mail message that is not included in the document or cover sheet, since the e-mail message will not be saved with the case and since other parties may not see it.

Page 26:

The second, and most efficient, method is the “true” electronic filing. In this scenario, the filing party would log on to the Internet – presumably through the “lowAccess” page using an Internet browser of their choice. They would be asked to “log in” and provide the court with identification such as their name, address, phone, affiliation (if any), bar number and any other data useful to the court. In addition, we would recommend that many of the fields that would later be required by ICIS be entered by the filing party and then “dumped” into the appropriate ICIS database entry fields saving time and effort on the part of the Clerk’s staff.

This process seems to be unnecessarily complex for users. They should provide detailed information when they sign up to file electronically. Thereafter, a login ID and password should be sufficient.

Page 27:

Documents filed electronically can be “stamped” and returned by e-mail or to the fax machine of the filing party automatically as part of the pre-established distribution list. After a document is received, an electronic receipt with confirmation information would be automatically generated to assure the submitter that all was received in good order and that in the event of system failure, they can produce proof of successful submission. Copies of the images would also be sent to the opposing party, appropriate agencies and others that the court sees fit. This could be accomplished three ways:

- Mail (images printed on a high-speed laser printer)
- Fax (if intended recipient consents or requests)
- E-Mail (if the intended recipient consents or requests)

Documents should not be returned to the filer and the court should not assume responsibility for service of documents.

Page 28:

Conformity to a generally accepted standard is also very helpful in the scanning process as it allows for faster data entry and less hunting for critical data on a page. In many cases, the use of a standard form could eliminate the need for data entry all together as the scanners can be configured to recognize a particular form and extract data to be deposited into ICIS without human intervention (i.e. Bar codes, OCR and ICR technologies).

OCR technologies are not sufficiently reliable to use in extracting data from documents supplied by external parties.

Page 28:

Once forms are standardized, they can be rendered electronically and filled out on screen rather than on paper and achieve the ultimate level of EDMS accuracy and efficiency. This report includes examples of Electronic Forms (PDF forms) that have been printed. The electronic version of this report contains rough examples of working forms for your review and experimentation (Appendix 3).

The NCSC project consultants do not recommend Adobe PDF forms as a standard and believes that web forms are a superior approach.

Page 28:

When it is necessary to submit an unfamiliar document to the system from an internal user like a Judge filing a unique court order the use of an informative cover page could be very valuable to the speed and accuracy of data entry and the processing of the document. Many Clerks commented on the challenge of ensuring an accurate rendition of the document to its corresponding database entries. While it was almost always accomplished successfully, it often took more effort than it realistically should have.

The NCSC project consultants do not believe that requiring judges to complete cover sheets for orders is practical or reasonable.

Page 29:

Internet Pushing and Pulling/XML

When surfing the Internet, your browser retrieves pages from a World Wide Web (WWW) server. This retrieval is often referred to as “pulling”. Your computer or browser “pulls” pages from the server to your desktop as you define your expectations and needs.

Using a language like XML, you can go much further and do more. Assume, for now, that you can use channel information or XML in your browser. A file similar to an intelligent “bookmark” on the system tells you where to find information about a particular subject. Now that you have this information, you can tell your browser where all the important news about your subject resides on the net.

Your browser can use channels and XML to gather information in one of two ways:

Smart pull: Smart pull means that the browser still pulls the pages from the server, but there are two important differences:

- Directed: Now that you have a file that tells the browser where to find relevant information about a particular area of interest, the days and hours of searching for it are gone.
- Automated: You can set up the browser so that it automatically checks for new information on the specified server. Because a channel is not just a bookmark, the browser can check more than just the home page to find out whether news that you want to know is there.

Push: Push reverses the idea of traditional Web browsing. Instead of having the browser pull information from the Internet, a process on the server (or at least a process that checks the data on the server) sends all the information needed to your client. So the browser no longer has to go out to the Web – the Web comes to your browser.

This discussion of XML is outdated and should be replaced with a more current description of the technology and how it is used.

Page 31:

A document handed to the clerk at the service counter will be scanned at a scanning station behind the counter or elsewhere within the clerk’s working area. This action will enter the images of the pages being submitted into the EDMS workflow system, where it will be time-stamped and await further processing by the courthouse staff. Once the document has been scanned, the original paper copy is returned to the submitter as their personal copy.

Documents should not be returned to filers.

Page 31:

It is possible, as an optional feature, that scanned pages be run through an OCR (Optical Character Recognition) process. This process allows scanned pages to be searchable by the words within them, much as a search within a word-processing document is possible.

OCR technologies are not sufficiently reliable to use in extracting data from documents supplied by external parties.

Page 32:

Because computer access to courthouse documents should be web-based, it is possible for submission or retrieval of documents either from privately owned PC's or from strategically located public PC's. To ease the amount of work at the service counter, kiosks could be placed outside of the clerk's office, at which the public could interact with the courthouse without involving a staff member. PC's located at libraries or other public locations could also be used for this purpose.

Experience has shown that individuals using kiosks still will require assistance from court personnel for all but the simplest of tasks. Locating court kiosks at libraries or other public facilities is not a good idea because such assistance would not be available.

Page 32:

Further protection against network infiltration is possible, including biometrics-based security systems which allow only pre-designated personnel to access system resources based upon physical identification (thumbprint reading, voice recognition, etc.).

Biometric security does not seem practical for parties external to the courts. Login ID and password should be sufficient.

Pages 34 – 41:

All technical standards must be updated to reflect current availability.

Page 42:

To accomplish many of these goals, it is our recommendation that vendors wishing to supply EDMS services to the Judicial Department be specific about the user interface or interfaces that they will design or install. The vendor should be required to provide mockups of key screens and should display a working knowledge of the processes performed by the computers and the objectives of the people who will eventually be required to use the EDMS. Many projects have been relegated to the digital "trash-heap," not because the technology was insufficient to the task but because the designer was not in touch with the users and their needs.

The interface to the EDMS should be through ICIS.

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4. CD-ROM system could actually be more time and effort consuming than original method if user is unable to operate the software
5. CD-ROM system could be unreliable and unable to achieve acceptable user confidence level

CD-ROM technology is not the recommended approach for EDMS. Magnetic disk provides sufficient capacity at a low cost, with much faster access and more reliability.

CONCLUSIONS

The Iowa Judicial Branch has a mature, competent, and dedicated technology organization. They have developed an excellent case management system and are moving ICIS in the proper direction by adding an EDMS. They are capable of developing, implementing, and supporting these new features, given sufficient resources.

The integrated justice initiative in Iowa also is off to a good start and eventually will be an important factor in the success of the EDMS by eliminating a large portion of the paper processed by the courts. The EDMS and IJIS development must proceed hand in hand.

Evolving technology makes the EDMS practical today, and the probability of success in Iowa is very high. Many of the keys to success relate to how policy and business issues are managed. The NCSC project consultants believe this report offers helpful recommendations to assist your efforts. We appreciate the opportunity of performing this review and would be pleased to provide further assistance in the future.

APPENDICES

Appendix A – Project Participants

Appendix B – Policy Areas from Guidebook

Appendix C – Whitepaper on Digital Rights Management

Appendix D – The National Center for State Courts

APPENDIX A – PROJECT PARTICIPANTS

The following individuals were interviewed or participated in discussions related to this project:

- Ken Bosier, Senior Systems Administrator
- David K. Boyd, State Court Administrator
- Cristal Ewald, Senior Systems Administrator
- Honorable Duane E. Hoffmeyer, District Court Judge
- Honorable Robert A. Hutchison, District Court Judge
- David Meyers, Justice Information Systems Coordinator
- Honorable Michael R. Mullins, District Court Judge
- Larry Murphy, Director of Information Systems and Technology
- Scott Ruhnke, Senior Systems Administrator

APPENDIX B – POLICY AREAS FROM GUIDEBOOK

The following is a list of policy areas that are relevant to Iowa's EDMS project that were published in *A Guidebook for Electronic Court Filing*. For more detail on each, please see the guidebook.

1. Requirements to develop a plan and operating procedures
2. Authorization to accept electronically filed documents
3. Specific documents only
4. Technical standards for system use
5. Agreements between courts and filing parties
6. Making electronic filing mandatory
7. Specific data requirements
8. Electronic authentication
9. Digital Signature
10. Requirements concerning passwords
11. Provisions concerning paper records
12. Retention schedule for electronic records
13. Exemptions from public disclosure laws
14. Public access to electronic records
15. Sealing and expungement of records
16. Collection of filing fees
17. Fees for electronic filing service
18. Electronic filing system constitutes docket and other records
19. Electronic document is written
20. Electronic document is usually deemed to be an original
21. Electronic document is conditionally deemed to be signed
22. Paper original, or follow up filing, is not required
23. Paper copy of electronic original may be used
24. Procedures for submitting electronic documents
25. Page limits on electronic filings
26. Attachments, appendices, or exhibits in different form
27. Filing time
28. Standards for organizing, identifying, and indexing documents
29. Acknowledgment of receipt
30. Electronic issuance of summons
31. Electronic service
32. Private service providers
33. Assumption of risk for system failure

APPENDIX C – DRAFT WHITEPAPER ON DIGITAL RIGHTS MANAGEMENT (DRM)

Verification, Validation, and Authentication of Electronic Documents in Courts: How Digital Rights Management Technology Will Change the Way We Work (Draft 1)

By James E. McMillan
Principle Court Technology Consultant
National Center for State Courts
July 2005

Overview and Introduction

Validation and verification of electronic information is a considerably significant subject for the judicial and legal system. It is called by many names such as Digital Rights Management, Digital Signatures, Secure Computing, and others. Suffice to say, in courts we need to know if the document is complete and has not changed and second, that the person who has signed the document is actually that person. In this white paper I will attempt to cut through the technical jargon and simply explain how these technologies work and, how they apply to the courts and legal process. I will also attempt to list efforts to date to set standards, rules, and statutes for use of digital signatures and other affiliated efforts.

The judge's signature is the spark plug in the court's engine. If one looks at a court caseflow or process diagram it is easy to see that there are many stop points where the judge reviews and approves or disapproves the document before the caseflow process can continue. Similarly in many courts file stamps are used to verify that a specific review or fee payment has occurred. After all, most of the court staff is dedicated to the collection, organization, and creation of information for judges to make decisions. Therefore, a clear "choke point" that is ripe for improvement is judicial and clerical authorization in the work/caseflow process.

However, we should also recognize that by automating the judicial authorization step, several other improvements to the court system could be facilitated. First, a more secure electronic document can result. Second, better control of a document's content is possible. Third, multiple persons can almost instantaneously receive the document. And forth, an automated audit trail can be created thus providing the same level of trust as banking and financial transactions for the resulting legal document.

And so the last point first. Paper legal documents are held to the same level of authentication as banking records and yet, that trust is largely a façade. Even with forensic specialists as skills as the FBI, with today's computer generated / laser printed documents, it can be extremely difficult if not impossible to validate a document created with these means. (As an FYI, this is because in most printers when you change the "cartridge" one changes the entire printing engine). But a more significant point is that rarely if ever is a signature compared or validated within the court system. In nearly 25 years, I have never seen a court clerk pull out a signature card (if they exist at all) or a comparative document to make sure that it was actually the judge who signed the

document. More often it is the courier or “chain of evidence that is trusted that the warrant or release order came from the judge. An example of this kind of trust resulted in at several instances when the jail trusted their fax machine and released detainees who had sent fraudulent release orders.¹ Thus if there is a question about the document an “out of band” technique, the telephone call, is used to validate it. Meaning if the deputy at the jail questions the authenticity of a paper document, they will call the judge (more likely the judicial assistant) who generated the document. The judicial assistant then checks their file to verify that it was their document.

So what have we learned from current practices. First, nobody really checks the signature for validity. Second, it is the messenger who is trusted. Third, if there is a question of authenticity an “out of band” approach is used to perform the double check. And fourth, control copies are made to add an additional verification capability.

This white paper will therefore discuss the electronic version of signatures, verification, and validation and how they can be successfully used by courts to create a system that far exceeds current practices.

Why Electronic Documents?

So what is wrong with paper documents; after all, they have served court systems well for more than 2,000 years? Unfortunately the answer is that our customers (we refer to them as citizens) demand government to do more with less. Considering that on average between 80 and 90 percent of a court’s budget is used by personnel cost, it makes eminent sense that the existing court staff be used efficiently. Finding court files, creating, copying, and physically moving documents is not an efficient process. If it was then banks and Wall Street would still be using paper.

In 1998 I viewed a presentation by John Seely Brown.² He stated at that time that 65 percent of all private corporate communication was electronic and that approximately 35 percent of all electronic communication would never be committed to paper. Further, during that same time period West Group (now Thomson-West) administered a survey that found that 99 percent of all attorneys used a computer to draft and/or edit documents using word processing software. Since that time those numbers have only grown. In addition, use of the Internet has become ubiquitous. It is common to have wired or wireless internet access in hotels, airports, and even coffee shops throughout the country.

But with any tool such as automation it can be abused. Enron and other corporate crimes have shown that computers and networks can be used to steal more, faster, than ever before. In response to these abuses, and recognizing that corporation will never return to the paper records, the Sarbanes-Oxley law was passed by the US Congress requires stringent electronic record keeping. For example in an article on the law for Transform Magazine, “Compliance Becomes a Top Concern”³ it was stated that:

¹ See “Accused felon free after phony fax is found” at <http://www.theeveningtimes.com/articles/2004/11/04/news/news5.txt>

² <http://www.johnseelybrown.com>

³ <http://www.transformmag.com/showArticle.jhtml?articleID=17500846>

“To avoid penalties, it is important to understand the specifics of requirements. For example, SEC Rule 17a-4 states that broker-dealers must preserve all electronic records "exclusively in a non-rewritable, non-erasable format." (It almost goes without saying that these, and all other corporate records, be retained only as long as legally required, after which time they are destroyed.)”

As a result, judges and courts will have to deal with increasing amounts of electronic information for evidence.

However it is the entertainment industry that has been in a continual development battle with the “hacker community” to try to protect digital media such as music and video. As the Recording Industry Association of America (RIAA) puts it:

“No black flags with skull and crossbones, no cutlasses, cannons, or daggers identify today’s pirates. You can’t see them coming; there’s no warning shot across your bow. Yet rest assured the pirates are out there because today there is plenty of gold (and platinum and diamonds) to be had. *Today’s pirates operate not on the high seas but on the Internet, in illegal CD factories, distribution centers, and on the street.*”⁴

We have all heard about the efforts of this and other groups seeking to protect intellectual property through various means such as advertising, legislation, and prosecution in the courts. However, they are also at the forefront in the creation of technology to protect digital information. As a result judges and courts staff need to understand that these efforts are given “spin” by both proponents and opponents. But in the case of the courts, these efforts can result in very useful technology that could better protect information and hence the rights and privacy of the citizens participating in the legal process.

What are Digital Rights Management and Electronic Signature Authentication?

Digital Rights Management (DRM) is technically the use of encryption⁵ (coding) of electronic data so that the creator has control over its use. As noted above considerable work has been done by the entertainment media companies in this area. One simple example of DRM technology is the area coding of DVD movie disks. Working together with the electronic equipment companies, the media companies have encoded the DVD disks with control code that will only allow that particular disk to be played in a specific area of the world. An “Area 1” disk can only be played on an “Area 1” DVD player sold in North America and so a DVD purchased in Europe cannot be played on the North American player.

⁴ <http://www.riaa.com/issues/piracy/default.asp>

⁵ In [cryptography](#), **encryption** is the process of obscuring [information](#) to make it unreadable without special knowledge. While encryption has been used to protect communications for centuries, only organizations and individuals with an extraordinary need for secrecy have made use of it. In the mid-1970s, strong encryption emerged from the sole preserve of secretive government agencies into the public domain, and is now employed in protecting widely-used systems, such as Internet [e-commerce](#), [mobile telephone](#) networks and bank [automatic teller machines](#). (<http://en.wikipedia.org/wiki/Encryption>)

In the context of the court, a document can be encrypted with DRM control code to:

1. Restrict who can read the document (or at least who has rights log into to that user's account to read the document).
2. Restrict how long a document can be read.
3. Restrict whether a document can be printed.
4. Restrict whether a person must logged onto a specific network to read the document.
5. Restrict whether an email can be forwarded.

While controlling content is important to the courts, authentication and validation of information is equally important. Digital signatures are the answer to this problem in the electronic world. And it is interesting to note that courts have been in the forefront in the creation of electronic signatures for not only legal work but also for business transactions. Mr. Alan Asay of the Utah Courts was an initial driving force in the creation of digital signature legislation in 1993⁶ and was a speaker at the Fourth National Court Technology Conference held in Nashville, Tennessee in 1994. He stated in his article⁷ for that conference that:

“Privacy-enhanced mail standards add signature capabilities to ordinary e-mail systems, enable the recipient to assure confidentiality and prevent tampering en route, and prevent the sender from disavowing the document once sent.”

As defined in Wikipedia:⁸

“Digital signatures are a method of [authenticating digital information](#) analogous to ordinary physical [signatures](#) on [paper](#), but implemented using techniques from the field of [cryptography](#).”

Digital signatures differ in some respects from their physical counterparts, however, in that they authenticate the entire document and not just the physical page that the person signed or initialed. This is important as we will discuss later because courts are used to altering documents by adding secondary authentication though the use of file stamps and clerk or judge signatures thus creating a “chain of evidence” or control. A wealth of information on digital signature legislation is available from the Baker & McKenzie law firm on their E-Transactions Law Resources website located at: <http://www.bakernet.com/ecommerce/home-transactions.htm>.

In 1996 the American Bar Association, Information Security Committee, Electronic Commerce and Information Technology Division Section of Science and Technology issued their Digital Signature Guidelines.⁹ In that document they state that:¹⁰

⁶ For more on the Utah Digital Signature Act see this archived Network World magazine article at: http://www.findarticles.com/p/articles/mi_qa3649/is_199509/ai_n8732974

⁷ http://www.ncsconline.org/D_Tech/ctc/showarticle.asp?id=112

⁸ http://en.wikipedia.org/wiki/Digital_signature

⁹ <http://www.abanet.org/scitech/ec/isc/dsg-tutorial.html>

¹⁰ For sake of brevity I have removed the footnotes that cite legal references. Please see the full ABA Guidelines document for complete information.

“A signature is not part of the substance of a transaction, but rather of its representation or form. Signing writings serve the following general purposes:

- **Evidence:** A signature authenticates a writing by identifying the signer with the signed document. When the signer makes a mark in a distinctive manner, the writing becomes attributable to the signer.
- **Ceremony:** The act of signing a document calls to the signer’s attention the legal significance of the signers act, and thereby helps prevent inconsiderate engagements.
- **Approval:** In certain contexts defined by law or custom, a signature expresses the signer’s approval or authorization of the writing, or the signer’s intention that it have legal effect.
- **Efficiency and logistics:** A signature on a written document often imparts a sense of clarity and finality to the transaction and may lessen the subsequent need to inquire beyond the face of a document. Negotiable instruments, for example, rely upon formal requirements, including a signature, for their ability to change hands with ease, rapidity, and minimal interruption.”

How Could DRM and Digital Signatures Be Used in Courts?

The good news is that digital signature technology is already being used by the US Federal Courts in their Electronic Case File (ECF) E-filing system. When a document is submitted (using a secure encrypted connection over the Internet initiated by the attorney when they log into the courts ECF website); the Federal Courts E-filing software creates a digital signature “receipt” that is E-mailed back to the filer. The same digital signature is also stored in the courts computer system. Digital signatures are so precise that if a single pixel (dot) is changed on the document, the digital signature will no longer match the original. This is clearly a much higher standard than what is possible with paper records. And while electronic copies can be made, digital signatures authenticate the content of all copies.

There is also the myth in legal records that paper in and of itself is secure. However as we all know by seeing forged digital documents and pictures in the news media, one cannot necessarily believe what one sees on a piece of paper. So there is a need to advance to new levels of validation and verification and control of data and electronic documents in the courts. Paper records therefore now require additional secondary verification and validation.

As a result of this change from paper to electronic records, the concept of an “original document” is changed. But what is an original document in a word processing world. Is it the bits stored on the attorney’s computer? Is it the first paper copy made in the attorney’s office? Is it the file stamped paper copy accepted in the clerks office... and then there are three “originals” authorized during filing. So in essence the concept of original is the same as being authenticated and thereby transmitting the essential information the author intended. This is no different than use of the digital signature.

Before we go on I must differentiate between digital and electronic signatures. Digital signatures result from a mathematical formula (a hash) being created from the actual computer file. An electronic signature is a facsimile of a handwritten signature. Now there is wonderful technology available that combines the two but, they are different.

Digital signatures are therefore essentially a one way authentication. However, there is a need for greater control of court information and the court case file through two way authentication. For example, I can validate that I am the person sending the document and also validate that the person receiving the file is the person meant to receive it.

DRM technology applies the Public Key Infrastructure (PKI) technology to the question of access and control of the court case file. PKI can be simply thought of as a box with two keys. I lock the box with my key and the recipient opens it with theirs. Nobody else has a key to that document nor will they ever have one unless the creator creates another pair of keys. The obvious benefit to this technology is that the recipient cannot create another set of keys to forward your document.¹¹

Currently there is considerable concern in the legal community with the conversion from paper files to electronic. In particular, courts and legislatures are wrestling with the overall question of what information should be made available via the Internet.¹² I believe that this problem can be broken down into three more direct questions:

- Is the entire case or case type sealed?
- Does the specific document contain personal information that can be used for identity theft?
- Does the document contain names or other information that compromises the personal safety of an individual?
- Will the file be sealed by law at a specific time in the future such as in juvenile matters?

If the answer to any of these questions is yes, then use of DRM technology should be seriously considered. Currently database access control through linked records and application security is used to control access to information. However, the data is still completely open to view by computer and database administrators and programmers. As a result there courts have experienced embarrassing moments when computer reports were run and sensitive information was unintentionally released. Encrypting the record, either within or outside the database using DRM insures that unintentional release is much less likely to occur. This is because DRM introduces a second and perhaps a third level of security. Level one is the operating system (such as Microsoft Windows or Unix/Linux). Second, if the document or the document link is stored in a database, that security comes into play. And third, access to the document itself is secured using DRM. But there are additional issues and considerations that should be addressed.

¹¹ For a more complete, yet simple explanation of PKI technology go to: http://www.opengroup.org/messaging/G260/pki_tutorial.htm

¹² The NCSC makes extensive information on this subject available at: <http://www.courtaccess.org>

As we all know, courts do not work in a vacuum. They continually interact with other parts of the criminal and civil system as well as the public. Therefore the distribution of information is also of concern as well as control of that information once it moves beyond the courthouse doors. Presently it is the security of the individual office's physical facility and their records management system that determines how strong or weak that the agency's ability to secure records. It also depends on the trustworthiness of all court or agency staff since file cabinets are unlocked during the day; files are left on desks and in unlocked offices; and entry level staff (and often low-paid staff) are used to move files from location to location. All of these present opportunities for access. As an example I have recently worked with a high security court created to hear cases involving organized and war crimes. Before the secure electronic document system was implemented information was "leaked" to the press on a regular basis from the paper based system. After full implementation of the electronic records and document system, no leaks were recorded. Therefore, at least this courts experience has proven that electronic records are more secure than their paper-based cousins.

Current Technology Options

Two major technology corporations whose products that courts use everyday; Microsoft and Adobe both have major DRM initiatives underway. Microsoft Rights Management Services (RMS)¹³ provides PKI services for Office and in particular, the Outlook E-mail client program. One very nice feature of this product set is the ability to mark an E-mail message as read but can't forward. A sender can also restrict an E-mail from being printed. RMS can also be used to protect information sent to an outside the court recipient through the use of their Passport technology. In other words, if you want a person to receive a protected E-mail, all they have to do is to create a free Microsoft Hotmail (www.hotmail.com) account. Similarly Adobe's LiveCycle Policy Server¹⁴ provides similar services that control access, reading, printing and forwarding electronic information. And both systems have "toolkits" that allow them to be used in conjunction with other software such as databases. Application of this technology could then provide that extra layer of security to information stored in the court's database. An article summarizing use and implementation of DRM systems including two other systems offered by Authentica and Liquid Machines was published in the June 27/July 4, 2005 edition of eWeek Magazine.¹⁵

Conclusion

New technology will allow courts to better server the public by protecting digital information. Court technical staff needs to begin working with policy makers to test and then implement this new technology and modify the court and legal processes to take advantage of these new capabilities.

¹³ <http://www.microsoft.com/rms>

¹⁴ <http://www.adobe.com/products/server/policy/main.html>

¹⁵ <http://www.eweek.com/article2/0,1895,1830805,00.asp>

APPENDIX D – THE NATIONAL CENTER FOR STATE COURTS

The National Center for State Courts (NCSC) is a nonprofit organization incorporated in the District of Columbia in 1971, with its headquarters in Williamsburg, Virginia. The Court Consulting Services Division (CCS) of the NCSC is based in Denver, Colorado. The NCSC was created by, is controlled by, and serves the nation's 56 state and territorial court systems. Its Board of Directors includes judges and court administrators from all levels of state and local courts. The President of the NCSC is Mary McQueen.

The National Center for State Courts is dedicated to modernizing court operations and improving justice at the state and local level throughout the country. It functions as an extension of the state courts, working with them to provide an effective voice in matters of national importance. The NCSC thus acts as a focal point for judicial modernization, serving as a catalyst for implementing standards of fair and expeditious judicial administration, and helping to determine and disseminate solutions to the problems of individual courts and state judicial systems. Its work includes providing information, technical assistance, and consulting services to courts and other interested parties, and conducting research and evaluations in all areas of operation of the court.

Lawrence P. Webster, project director, is a Principal Court Management Consultant for the National Center for State Courts. He previously managed the Justice Information Exchange Model (JIEM) project for SEARCH, served as Delaware's State Court Administrator, Executive Director of Court Technology Programs at the National Center for State Courts, Director of Data Processing for the Utah courts, System Manager for the U.S. Attorney, District of Colorado, and Manager of Operations and Systems Development for the Colorado District Attorney's Council.

Mr. Webster has delivered numerous seminars, presentations, and courses and has headed or participated in research, education, and consulting projects related to technology in the justice system. He was the principle author of *Roadmap for Integrated Justice: A Guide for Planning and Management* (SEARCH, 2004), *Information Technology Management Core Competency Curriculum Guideline* (NACM, 2003), *How Can Court Leaders Use Technology to Address the Justice Needs of a Multicultural Society in the 21st Century?*, (A commissioned paper for NACM, 2000), *A Guidebook for Electronic Court Filing* (West Group, Inc., 1998), *Automating Court Systems* (NCSC, 1996), and *Planning, Acquiring, and Implementing Court Automation* (NCSC, 1993), and has prepared or assisted with more than one hundred other books, articles, technical reports, and papers on similar topics.

Mr. Webster holds a Master of Science in Judicial Administration degree from the University of Denver College of Law, is a fellow of the Institute for Court Management, and is a graduate of ICM's Court Technology Certificate Program.

James E. McMillan, a project team member, joined the National Center for State Courts in October, 1990 and currently directs the Court Technology Laboratory (CTL) and assists with the Courtroom 21 project with the William and Mary School of Law. These projects have received over two million dollars in computer hardware, software, and other technology donations for demonstration to courts and interested parties. In the first eight years of its existence, more than 800 visits from courts in all 50 states and more than 70 foreign nations have been hosted by the CTL. In addition, over 10,000 persons have viewed remote CTL presentations.

Mr. McMillan also has directed the Court Technology Performance Standards Project, serves as senior faculty for the Institute for Court Management, and has provided technical assistance for numerous trial and appellate courts, including the United States Supreme Court, the Arkansas and Mississippi Supreme Courts, and the Oklahoma Court of Criminal Appeals. Internationally, McMillan has consulted with courts in the Bahamas, Egypt, Trinidad, Ukraine, and the Russian Federation and for the United Nations International Criminal Tribunal. Mr. McMillan currently provides leadership in the effort to create Electronic Filing and XML electronic document systems.

Before joining the National Center, Mr. McMillan directed information services for the Arizona Supreme Court Administrative Office of the Courts, where he automated the state supreme court, administrative office of the courts, court of appeals, superior courts, limited jurisdiction courts, juvenile courts, and probation departments.

Mr. McMillan previously held positions with the U.S. Department of Justice and the Los Angeles Superior Court. He was a keynote speaker at the Fifth National Court Technology Conference and a lecturer for the National Judicial College, University of Southern California Judicial Administration Program, Smithsonian Associates, and many other national and international court, law, and technology interest groups. Mr. McMillan received his BA in government from New Mexico State University and an MPA with a specialization in judicial administration from the University of Southern California.

Mr. McMillan is co-author of *A Guidebook for Electronic Court Filing*. He has been quoted by *PC Week*, *The New York Times*, *American Lawyer*, *Lawyer's Weekly*, *Government Technology* and other magazines. He has also published articles in *The National Law Journal*, *Court Manager*, *Trial*, *The Judges Journal* and *The Court Technology Bulletin*.