

Reducing the Costs of Civil Litigation

Using New Technologies

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I. Introduction

Some futurists predict that technology, in particular computers and computer networks, will change law in very fundamental ways: the way lawyers think, the place of lawyers in society, and the relationship of lawyers to clients. [1] Further, there is no doubt that technology has changed, and is continuing to change at lightning speed, the way law is practiced. Lawyers and law firms are constantly integrating new technologies into their practice. Notwithstanding this, however, the law is one of the last professions to adopt technology in its operations. The business world has rapidly embraced technology, and is consequently leaps and bounds ahead of the legal world in its technological advancement.

As slow as lawyers and law firms are, however, in adopting new technology, it is estimated that they adopt technological advancements at least three times faster than the judiciary. This is a disenchanting figure when one considers the enormous cost and time saving potential inherent in technology. It is especially disenchanting considering it is the judiciary which establishes the systemic characteristics of law practice, with the rules and procedures they create governing lawyers in their interaction with the courts. As such, no matter to what extent private practice adopts technology in its internal affairs, the potential cost and time savings which technology presents can never be fully realized unless the system in which law is practiced itself embraces technology; unless the judiciary embraces technology.

In this paper, I catalogue many of the technologies which have been tested and proven to have very significant cost and time saving potential, if implemented and used efficiently. It must be understood that many of the technologies discussed overlap with each other. Thus, though I have attempted to break them into distinct categories, the process is imperfect since the technologies themselves are not naturally divisible into distinct categories.

I have divided my discussion of the technologies into two categories. In part II, I discuss those technologies and reforms that can aid the judiciary in management and administration, thus reducing the costs of civil litigation by allowing the court to realize significant cost savings via more efficient operations. In part III, I discuss those technologies and technological reforms that can be implemented in the litigation process itself, whether in the pleading, discovery, or trial stage, thereby reducing the costs of litigation through efforts of both the judiciary and the attorneys.

II. Court Management: Improvements in Communication, Data Storage, and Data Processing.

Courts process enormous amounts of information daily. The sheer complexity and volume of this information, together with the large volume of matters before courts, requires a large staff devoted to the processing and administration of court matters. Until very recently, all of this work has been performed almost exclusively by manual labor. Due to the invariable ways in which the large amount of the data taken in and managed by the courts interrelate, often, court staff find themselves conducting repetitive entries and indexing of this information. To the extent the tasks conducted by court staff repeat earlier work, inefficiencies exist which, if corrected, could greatly reduce the time and money spent on court management and administration.

One of the main areas in which technology can greatly increase efficiencies in court operations is in this area of court management and administration. Computer systems excel at performing repetitive tasks and processing enormous amounts of data. Further, to the extent the computer system is integrated with the other software run on the computer, the data collected from operations of this other software will all enter the same database. In other words, entries need only be made once and the info will be plugged in to all areas in which this data is relevant. Staff time will significantly be reduced, thus providing the same service more cost and time efficiently.

A. Case Management Systems ²

1. Introduction

The first essential requirement in a court system whose aim is to implement technology in order to increase efficiency and save time and cost is to create and implement an automated case management system.

Case management systems are packages of computer software that accelerate the work of the court. Case management software is used to collect, organize, process, store, and distribute court data within the court and to external agencies. The systems perform simple and repetitive tasks faster, with greater accuracy, and at a lower cost than would be incurred doing them manually. They facilitate sophisticated case flow management techniques and can summarize case, party, and financial activity across a large number of cases. The user can quickly identify cases that exceed normal processing parameters, prompting early resolution of problems. In short, staff productivity is improved, case-processing time reduced, and records storage compressed - essentials for effective management.

2. Description

Automation professionals design and construct the computer software that is the key component of court case management systems to perform specific tasks that were previously performed manually by court staff, as well as additional tasks that were simply not practical before this technology was available:

- 1) Information keyed into the system can be analyzed, aggregated, and organized to

inform staff of the status of the entire caseload.

- 2) Case data are accessible to multiple users simultaneously.
- 3) Document generation programs present information, such as notices, orders, and warrants, on paper in pre-set formats.
- 4) Report programs present case data in matrix form to help staff monitor overall caseload.

3. Opportunities

Case management systems help provide more efficient service to the public in the following ways:

- 1) They eliminate many of the repetitive tasks inherent in case processing. In a manual system, the same information is entered on paper documents over and over again, while in a computer system, a single entry is sufficient. Often, data entered into a computer system at one location can be shared by all staff and by other organizations, eliminating some data entry entirely.
- 2) Information can be retrieved in dozens of ways, rather than just by party-name or number.
- 3) Storing data electronically allows the database to be searched by computer. Judges and attorneys will no longer need to search endlessly to try to relocate the specific information. Searching by computer for words or phrases has become a widely accepted technique for locating the critical "needle in a haystack" of documents.
- 4) Case management systems allow the court to make case information available to public users with an ease that is not practical if the tasks are performed manually.
- 5) When paper documents or forms are filed, little can be done to ensure that information is accurate. A computer system can edit entries as they are made, and reject a court date set on a Saturday or an improper case type code. It can also apply other rules, such as revenue distribution formulas, consistently and accurately.
- 6) Computers excel at crunching numbers. Their facility in generating statistics and processing revenue receipts allows all aspects of court operations to be monitored and managed more effectively. The case management system, using commands to track workflow, can also route work automatically.

4. Limitations

There is no doubt that computer technology also poses certain problems:

- 1) System failures can virtually paralyze court operations, and computers have the capacity to make very significant errors.
- 2) Because the way a particular court operates is very court- and judge-dependent, it is difficult to model court processes with computer software, which makes system development an exercise in compromise that may very well deliver less than complete

satisfaction with the final product. Certainly, off-the-shelf solutions do not work as well as customized systems. Yet, custom systems take years to develop.

3) Further complicating the task of initiating a new system, or improving it once installed, is that almost every system development project must deal with a huge inventory of existing cases.

5. Costs

Costs for judicial automation range widely, depending on the size of the court or court system and the sophistication of the software. The total expense of court case management systems may vary from tens of thousands to millions of dollars over their life cycle. This life cycle includes development, purchase, implementation, operation, maintenance, and management. Courts usually focus on initial purchase price, and underestimate the long-term costs of a system. More realistic estimates must include significant funding for ongoing training, as well as for enhancements to correct and improve the system and to adapt it to a changing environment. A court commonly allocates 5 to 8 percent of its budget to automation support.

6. Trends

Today, most cases in large courts are processed using automated case management systems. Public access to case management systems and expanded networking are becoming commonplace. Innovative courts use client/server architectures that divide processing functions and data among computers. Other progressive courts are expanding their systems to include documents stored as images or text. A few are even accepting documents filed electronically, never storing the paper in the courthouse.

In the future, PC-based case management systems will contain video recordings of court events, accessible through the case docket and indexed with a text-format transcript. Images of exhibits, animations, and virtual reality demonstrations also will be a part of the electronic case file of the future.

B. Data Storage, Transmission, and Processing

The effective implementation of a case management system is not the end-all-be-all. In fact, in order to realize the full potential of a case management system, certain other technologies must be implemented. This section will also provide as a useful introduction to the discussion of JEDDI Judicial Electronic Document and Data Interchange.

How does information pass from the sender of information to the court's case management system? A brief discussion of the transmission of electronic information will address this question. Second, how can information be stored electronically so that the laborious burden on the court to store enormous amounts of information in paper form is lessened? A short explanation of imaging technology. Finally, once this information is stored electronically, how is this information processed with the other information already stored in a court's case management system? A brief discussion of integration of information will shed light on this question.

1. Electronic Transmission of Documents

The largest impediment to using computers to store and retrieve information is getting the information into the system in the first place. The procedures to input information are often redundant and unnecessarily costly to the client.

Court documents can be sent electronically, using E-mail. This would first require both the sender (attorney) and recipient (court) to have E-mail addresses. An E-mail address is simply a database set up for a particular user to store, send and receive electronic data and messages. The user taps into this database with a computer and a modem. Courts receiving these documents can then download the documents from their electronic database and store it in their case management system.

An alternative to sending a document electronically is to send magnetic (electronic) copies of documents along with any original document sent to a court. This will allow the court to immediately put the paper document in off-site storage, while retaining the electronic copy in the court's case management system.

2. Electronic Storage of Information

a. Automatic Storage via Electronic Transmission Technology

There is no paper burden on the courts when information has been originally transmitted to them electronically. In this case, the information is automatically stored electronically because it was sent electronically. Yet, this is not yet a common mode of doing business amongst lawyers. Therefore, the problem of how to lessen the paper burden when paper documents are sent to court is still very pressing.

b. Imaging Technology

Imaging consists of making a computerized picture of a document using a scanner. After the quality of the image is verified, it is indexed (connected electronically by appropriate software to a court case) so it can be retrieved with the specific case. After indexing is complete, the document is placed in the paper file and the image is committed to electronic storage.

Workstations are typically personal computers capable of displaying document images with other case information. Facsimile machines serve as remote input devices: documents can be accepted over a telephone line and placed directly on disk without copying them on paper. Networks carry documents to court staff involved in processing the case and display images at any workstation. At any point during the process the document can be accessed from any workstation by any user with appropriate security clearance.

Imaging offers immediate, concurrent access to court records. In manual operations, a significant amount of time is needed to retrieve a case file. With imaging, every document is available, even if someone else is working with the case. In imaging systems fewer documents are lost because original records almost never leave the file room. Further, because they are handled only once, misfiling is rare, and because the original papers are rarely touched, they are more secure and preserved in better condition.

The productivity of court staff should improve with imaging because less time is

spent filing and handling paper and routing work. Computerized workflow produces more uniform operations and creates automatic audit trails, leading to better monitoring of cases and staff performance. The public benefits when information can be obtained more quickly and conveniently.

Imaging has its disadvantages. The technology is complex and expensive, particularly when integrated with a case management system. When not integrated, case data must be entered by computer keyboard. Computer downtime can immobilize court operations. Conversion costs may be very high. The utility of imaged information, especially in light of case management systems, is limited. For example, word searches and database updates are problematic or impossible. Certainly, full-text searching is superior to imaging retrieval.

3. Processing of Electronic Information: Integrated Technologies

The concept of integration means that the information that is sent to the court is compatible with the case management system operated by the court. In other words, if the information sent to the court is integrated with the court's case management system, then the court's software can read, process, and automatically index this information when it is received. If the information is not integrated with the court's software, the information must be keyed into the system via traditional means: the computer keyboard. Thus, the importance of using integrated technologies is paramount.

One method of insuring that a document can be integrated with a court's software is to use Standard Generalized Markup Language (SGML). SGML is a way of marking the contents of a document for use by a database, text presentation software such as Folio Views or Adobe Acrobat, and other information systems. SGML can also assure that certain elements of the document are present. SGML is an excellent way of processing text and any data embedded in textual information, but it requires know-how to implement and requires filing parties to tag document contents before filing. Yet, much of the tagging can be automated using either SGML software or the style and macro features of most word processors.

4. Hypertext Links

One of the truly marvelous benefits of transmitting, storing, and processing electronic information is the ability to create and utilize hypertext links within the document. In any given court document, there are bound to be statutes and cases cited. Electronic documents can be linked to these statutes and cases using hypertext technology.

The principle of hypertext links is that each electronic document should include not only text but also pointers to other related items. As you read the text and find yourself interested in the related materials, you can "click" on them with your mouse and instantly retrieve the related documents on your screen. You can then explore yet other materials that are pointed to by the retrieved documents. When you're done exploring, you can easily return to where you began.

Attorneys could create hypertext outlines to link their key points to phrases in the documents, statutes, and case precedents. While this can be done now with some

computer outliners, the application of such technology is limited to those firms and courts already equipped to prepare the information. Electronic documents would broaden these applications significantly.

C. Judicial Electronic Document and Data Interchange (JEDDI)

1. Introduction

Once the case management system is implemented, enabling the court to more efficiently receive and process information, the next question is how can the costs of communicating with the courts be reduced?

James E. McMillan, of the National Center for State Courts, recently observed that the rest of the world has passed the legal community by when it comes to handling information. [3] Legal systems have always exchanged information in writing and verbally, and it is this exchange which largely determines whether cases are negotiated, settled, or tried. Consequently, the legal system has produced detailed rules on how written and verbal information should be communicated, stored, and used.

While those in the legal system are abiding by their procedures, however, the business world is storing and sharing information digitally (e.g., exchanging documents, sharing product information, posting electronic catalogs), using electronic mail and electronic data interchange (EDI). McMillan states one reason for these advances: "It is significantly more expensive to communicate on paper than by electronic means."

Recently, some within the legal community have begun to push to catch up through a concept known as JEDDI. The goal of JEDDI is to facilitate electronic exchange of written information in an organized manner for the legal community.

Electronic filing technology allows courts to receive pleading, motions, briefs, etc., in an electronic format, and provides accessible, up-to-date information. The inverse of this is that JEDDI allows lawyers to file lawsuits, briefs, motions, and to retrieve documents from computerized court files, without leaving their law offices. In essence, JEDDI is, quite literally, the parent of the paperless courthouse.

A handful of courts are experimenting with JEDDI. I will discuss three such experiments and follow with a generalized discussion of the benefits and detriments of electronic filing of computerized documents.

2. Examples of JEDDI

a. Electronic Filing of Forms: Snake River Basin [4]

An electronic filing project was developed by the Snake River Basin Adjudication, District Court (SRBA) in Twin Falls, Idaho, with support from the Idaho Supreme Court. The SRBA is a civil court with exclusive jurisdiction to decide the right to use water in the Snake River Basin (covering 95 percent of Idaho). Parties to the adjudication include the United States, four Native American Indian tribes, the state

of Idaho, businesses, corporations, and individuals. The SRBA is the largest case in Idaho history and includes over 150,000 claims. The goals of the system were to reduce the amount of paper filed and, more importantly, to make the court process work more efficiently, which makes it more affordable.

The computer system used by the SRBA district court was created by local court officials with the assistance of AT&T. Court officials supplied lawyers with a computer disk that gives them access to the system. It contains forms to be completed along with the modem program for sending and receiving documents.

Electronic forms provide blank spaces that users fill with specific information. This information is stored in a database and users send completed forms to the court via a modem, through an E-mail service, or on a diskette. Users send information simultaneously to multiple parties 24 hours a day with the "flip" of a button.

In the adjudication, Utah's attorney general filed 2000 objections on electronic forms within a few minutes. The court estimated that it would have taken a month to enter the objections manually. [5]

b. Electronic Filing of Case Files: The Utah Experience [6]

Although case files are the informational focal point of the adjudication process, until recently information technology has largely ignored them. Yet, many benefits await courts willing to apply information technology to case files and integrate them into a full-featured judicial information workbench.

Utah has developed an information system that automatically (1) receives signed case file documents via E-mail, (2) checks each such document for conformity to court requirements, (3) updates the court database with data extracted from the document, (4) adds the document to an electronic case file, and (5) responds with a return mail message to the sender reporting the actions taken. The electronic case file includes automatic hypertext links to legal research materials and is available on-line for reading, word-or phrase-searching, copying, printing, and annotating (highlighting portions of text, making notes and comments in reading the text, adding user-defined cross-references, etc.), without altering the original.

Since Utah's electronic case files and court database employ a client-server architecture, they are both readily accessible from remote locations, such as a lawyer's desktop.

c. The Delaware Experiment: CLAD

Delaware is the testing ground for Mead Data Central's CLAD - Complex Litigation Automated Docketing System. CLAD was introduced on an experimental basis in one case in December 1991, namely because the Delaware Superior Court found itself facing a paper crisis in 1990. The court's lifesaver has been CLAD, and it maybe the first step on the road to a paperless court.

The main cause of Delaware's paper crisis was huge, complex insurance coverage suits. In most such cases, discovery is wide ranging. In addition, big coverage cases are heavily lawyered and hard fought. For example, in 1988, Monsanto sued 40 insurance companies. Six years later, even though the case had not gone to

trial, a large amount of paper had been produced including over 5,500 filings. With attachments, some filings have been over a foot thick.

i) System Basics

CLAD is operated by Mead Data's Private Database Division, which stores data collections for corporations, law firms, and large cases, and allows customers to conduct LEXIS-type searches of data. If a Delaware law firm wants to file a 35-page motion to compel, the motion need never appear on paper. Once edited, it remains in the firm's word processing system. The firm contacts the CLAD system by modem and transfers the motion over phone lines to CLAD. This process, referred to as "uploading" on CLAD, completes filing. This filing is then immediately available to Delaware lawyers on CLAD.

Service is also simplified by CLAD. CLAD rules require service of a notice of electronic filing (NEF). The NEF is a one-page document with the case caption. It announces the title of the filed document, the date and time of filing, and the docket number. Party recipients of CLAD filings learn about such documents by reading NEF's or by periodically scanning the system for recent filings. When the party wants a filing, they contact the system, "download" the document, and read it on their computer screen or print it out in hard copy. Unfortunately, attachments must be served the old-fashioned way. [7]

The Court enjoys several benefits from CLAD. First, judges can have immediate access to any CLAD filing, on-screen or in paper form. Second, CLAD also eliminated the need to hire two extra clerks. In July and August of 1993 alone, there were 759 CLAD filings. Before CLAD, a clerk would have needed to key each of those into an existing computerized docket, enter the docket number on each filing, and then filed the document in the case file. With CLAD, the filing attorney and the system do most of that: the attorney makes the docket entry on-line at the time of filing; CLAD assigns a docket number; and CLAD automatically updates the docket sheet. Third, with filing space at a premium at the courthouse, CLAD has also resulted in a reduction in the volume of paper that must be stored. Because attachments must still be provided in hard copy, savings in shelf spaces is difficult to calculate. Yet, a judge for the Delaware court believes that the space savings has been significant. What once took nine feet to file can now be filed in one foot.

ii) Cost

For Delaware counsel, there is a one-time fee of \$200 for a password to upload. If a party is in another CLAD case, there is no additional fee. For any person other than Delaware counsel, the annual fee is \$50. Filing fees are \$4 and download charges are about \$.55 per page. These download charges are expensive for the party who is reading the motion. For example, if you are a party in a CLAD case and a thirty-page brief is "served" on you, you must pay almost \$20 to read it.

iii) CLAD II

At this time, electronic dockets are used only in the most complex cases in a few courts around the country. [8] In July 1994, the U.S. Bankruptcy Court in New York used the system for the Macy's Department Store bankruptcy. In February of 1995, the U.S. District Court for the Northern District of Ohio began using it for DES

product liability litigation. In May, the state court of Fulton County, Georgia, started using it in a complex environmental liability case that involves more than 500 plaintiffs and 25 defendants.

Will usage of CLAD extend beyond high stakes coverage cases? Robert Katzenstein reports that Judge Del Pesco and Mr. Herrmann, of whom CLAD is the brainchild, believe that in order to extend CLAD beyond high stakes coverage cases, the system's costs had to be reduced significantly.

The result of this realization is the bulletin board initially conceived by Herrmann--now dubbed "CLAD II"--and a 75 percent reduction in user fees. CLAD II is a bulletin board system with many of the same features as the original CLAD, with one significant difference. Instead of logging on to LEXIS and incurring one-line and search charges, CLAD II, available only to Delaware lawyers, can be accessed for free. A user can check, without charge, to see if any filings have been made the same day. Filings are available immediately for review and downloading. The fee for filing a document has been reduced from \$25 to \$4. Download charges have been reduced from \$.02 per line, or about \$1.20 per page, on CLAD to \$.55 per page on CLAD II. Finally, a user can review the docket sheet and call up any filing by using the docket number. Word searches, however, are not possible on the bulletin board; to do that, a user must go to the original CLAD database and pay Mead Data's access and download charges. [9]

3. Benefits of JEDDI

Electronic filing of computerized documents provides many benefits to both the lawyers involved, as well as the courts. They include:

- 1) Computers can move documents into court faster, less expensively, and with greater security than traditional modes of paper document delivery such as the Postal Service or couriers. [10] Users send information simultaneously to multiple parties 24 hours a day with the "flip" of a button. Consequently, users save money by greatly reducing photocopy and postal charges.
- 2) Electronic filing of computerized documents allows for the automatic entry of information into a case management system. [11] This reduces data entry time and eliminates errors.
- 3) Computers are faster and less expensive than humans for doing the nitty-gritty work of document retrieval, including the ability to access hypertext functions enabling a reader to point a mouse at a citation, tap the mouse button, and look up the citation. These capabilities save the time and effort of pulling paper files or volumes off shelves, flipping pages, and replacing the files or volumes.
- 4) With respect to the filing of electronic forms, this technology affords one the ability to control the information entered in a form. With an electronic form one can prevent incorrect, inappropriate or incomplete information from being entered and can place data in required formats automatically. By contrast, paper forms devote substantial space to informing users about what they can write in a form. Despite detailed instructions there is no way to prevent unwanted information from being entered.
- 5) Also with respect to the filing of electronic forms, this technology allows for much

greater flexibility in filling out the forms. An example of this flexibility is that a paper traffic citation may have spaces for perhaps four charges and two addresses. If additional information is collected, additional forms are needed. Electronic forms allow for virtually an unlimited number of traffic charges and addresses.

6) Storing [12] and sending the case file electronically allows the case file to be searched by computer. Judges and attorneys will no longer need to search endlessly to try to relocate the specific pleading in which a particular point was made. Computers, through full-text searches, search out relevant passages better in situations where no citation points the way. Searching by computer for words or phrases has become a widely accepted technique for locating the critical "needle in a haystack" of text. Further, the potential time and cost savings of this capability increases to the extent critical and often-used information is stored electronically. For example, the Alabama Supreme Court has stored its opinions and other work on a text database system called ZyIndex. The court has full retrieval capabilities without the cost of using commercial database services. [13]

7) When judges are writing an opinion for a particular case, they can conduct a full-text search using words or phrases of previous opinions in their jurisdiction involving similar fact patterns or issues. Judges can use these previous opinions either as an aid in writing their own opinions, or they can actually borrow heavily from such opinions in writing certain sections of their own opinion which will not vary from previous opinions, such as the section which states the law or the development of the law.

8) Because computers copy information with speed and ease, they greatly reduce the bother of tracking paper file custody and coping with lost case files. When a case is appealed, for example, an exact copy of the trial court record can easily be sent to the appellate court while leaving the original in the trial court. Alan Asay, technology developer for the Utah Administrative Office of the Courts, notes that this is a crucial point in judicial systems in which the trial court retains jurisdiction over a case on appeal. [14] Further, transferring data electronically to appellate courts reduces appeals time and cost.

9) With computers, geographic proximity and convenience of location are turning into antiquated concerns. Computers communicate well with each other which enables document retrieval and copying from remote locations. Remote access to the court's official case file greatly benefits lawyer and court efficiency. With the court's case file accessed from the lawyer's desktop, the courthouse does not close, allowing the lawyer to work after everyone at court has gone home. Further, electronic court documents allow the courthouse to receive filings 24 hours a day. No more will an attorney's brief or court action be delayed because traffic prevented the messenger from delivering the document before closing time.

10) Computer-readable documents can interact with other computer-based systems. [15] For example, a document giving notice of an upcoming hearing could interact with computerized calendaring software. The filing of documents is often tracked in a database. In particular, documents initiating criminal or divorce case are often packed with data gathered for demographic or criminal history purposes. In electronic form, documents transfer data into a database without the errors, high costs, and time lags associated with human data entry.

4. Disadvantages of JEDDI

Probably the biggest cost of JEDDI is the cost of implementing the type of case management system that is capable of running a JEDDI system. Ironically, in order to implement this time and money saving measure, courts would be required to incur significant up-front expenditures. Investment now to save money in the future.

Yet, there are some other systemic criticisms of electronic document filing. The first is that electronic documents are easily changed. However, James McMillan answers this criticism by pointing out that "with today's electronic signature software, legal documents can be made much more secure than their paper brethren." [16] Essentially, explains McMillan, the software both "locks" the contents of the document and records a log of the checksum number that the computer uses to retrieve the computer file. If a single bit of the computer file changes, the checksum number also changes. If these numbers are logged by the sender, a disinterested third party (such as an E-mail service), and the court, the documents can be verified.

Another argument, also addressed by McMillan, is that computer "hackers" could submit documents for a case. McMillan sheds light on the absurdity of this worry by pointing out that there is not a single court of which he is aware that verifies the attorney's signature when a document is filed. The situation with electronic filing will be no worse than with paper filing of court documents, and it may potentially be better because courts can control who has access to electronic files.

The third argument addressed by McMillan is that indigents will be unable to file a case in the new electronic world. McMillan answers that paper will not be altogether replaced. A court can continue to accept paper filings, which it may then scan into the system and store electronically in imaged format.

D. Electronic Public Access Systems (EPAS) [17](#)

Courts that have implemented an EPAS provide remote access to their information systems via PCS and modems, allowing remote users in some cases to view the same information that court clerks have on hand. The convenience of 24-hour access to court records, dockets, and calendars is clear. This convenience is especially realized in rural areas and multi jurisdictional cases.

Dade County, Florida, offers an EPAS featuring on-line, read-only, round-the-clock access to ten databases in the county, including civil, criminal, parking, traffic, property, tax collection, water maintenance, zoning, appraisals, and occupational and marriage licenses. Users have access to all data in the designated database: Nothing is excluded. Most users dial in on their own modems, though public terminals are available in three county law libraries, and in the civil and criminal divisions of the courthouse.

The \$150 annual fee, plus a 25-cent-per-minute access charge, pays for the entire system, which also includes an electronic bulletin board granting access to reports or data generated in the normal course of county business, including felony arrests,

DUI violations, evictions, and drivers with suspended licenses.

E. Internet

What is the Internet? A vast international network of computer networks connected via telephone lines, microwave links and satellite links that allows the user to contact other users worldwide and offers access to a huge repository of information, including vast quantities of legal information.

The Internet was developed primarily as a federal government and academic network. Computer science departments developed much of the Internet software, which is available either as freeware at no cost or as shareware with a nominal registration fee.

To get on the Internet, a user needs a computer modem and a commercial Internet Service Provider. The Internet Service Provider supplies an E-mail address, a password and a telephone number to enter the Internet. Because the Internet links computer networks, it is possible to send E-mail to anyone with an Internet address, anywhere in the world.

The advantages of Internet E-mail over USPS mail and telephone calls are numerous. Unlike the USPS mail, the Internet user does not have to find a stamp and drive to the nearest mailbox to send Internet E-mail. Unlike the telephone, Internet E-mail is never busy. Even if the telephone is not busy, if no one is there to receive the call, the caller may not want to leave a substantive message and communication is hampered. Using E-mail, the user can send a substantive message rather than leaving a message that only invites the receiver to call back.

Three protocols are central to using the Internet. SMTP (Simple Mail Transfer Protocol) is the protocol used to exchange E-mail. FTP (File Transfer Protocol) is the protocol used to allow a user from one machine to log in to another machine for the limited purpose of copying files to and from the remote machine. The remote machine is called an FTP site, and it is like a computer bulletin board. Finally, Telnet is the protocol used to allow a user from one machine to log in to another machine for the purpose of using the programs hosted by the remote machine.

What is on the Internet for lawyers? Legal List catalogues Internet resources for the legal community. The latest version contains 270 pages of entries ranging alphabetically from the Association of American Law Schools to West Publishing. In between are discussions of a myriad of legal issues, from the obscure to the practical. For example, SEC filings, the Congressional Record, the Federal Register, the UCC and Supreme Court opinions are all available on the Net. Further, the Internet provides an additional method of communication with witnesses, clients and colleagues and makes accessible, through tools such as the World Wide Web, a potential goldmine of information.

For example [18], one attorney in Iowa describes that after the local Social Security office had provided inaccurate information about a client's potential benefits, the attorney accessed the Social Security Web page. By legally dialing into the Social Security Administration files, he quickly obtained the information necessary to allow his client to receive benefits.

Further, the more than 800,000 attorneys in the Martindale-Hubbell Law Directory are getting something new added to their listings in the 1995 index: electronic mail addresses are accessible through the Internet. [19] Next to every attorney's name is an identification number that also serves as an E-mail address. Messages sent to attorneys who are not presently equipped to receive them will be delivered for free by regular mail, courtesy of Lexis Counsel Connect, the legal online service company that is providing the E-mail addresses.

a. Courts and the Internet

G. Burgess Allison comments, ". . . inexpensive and widespread connectivity over the Internet have given us an enormous potential, but where are the efforts to realize that potential? Where's the information at our fingertips? Where are the information superdestinations? Who's actually doing something?" [20] After cataloguing the wealth of legal research information available on the Internet (see above), Allison gives some suggestions of how courts contribute to the information superhighway:

Courts should "E-publish" court decisions, along the lines of Alaska's "Touch N' Go System," whereby the state downloads and republishes all the state Supreme Court decisions. Such would allow immediate access to these decisions without the hassle of going to the nearest law library and pulling down a case reporter or the cost of logging onto to a commercial database, such as Lexis or Westlaw. Certainly, there are occasions in practice where time is of the essence, for example if during a cross-examination, counsel must research whether a particular privilege exists in a particular situation. Internet accessibility of these decisions would save all relevant parties time in this situation, including the courts. Time is money.

Courts should also publish certain information, for example rules and procedures, on line. Allison refers to this as the "frequently asked questions" (FAQ) publication. "If you have some public service function, if your organization fields the same type of phone calls over and over and over -- you may have an opportunity to deliver that information in a much more efficient way. Build a FAQ for your local or state courts." Such a practice would no doubt improve access to the courts. Courts can break up the type of information published into categories: "Court Rules," "Procedure," "Types of Court Cases," "Civil Issues," "Criminal Issues," "Traffic," "Family," "Juvenile," and "Probate." While such a service may not result in a reduction of calls being received by courts, callers using the system would no doubt be more informed, thus enabling their requests to be processed more quickly and effectively.

Finally, courts should maintain a home page with pointers to all the law-related sites in their jurisdiction.

III. Technology and the Litigation Process: Pleading, Discovery, and Trial.

The litigation process is an extremely expensive endeavor. At the root of the litigation process is legal research. In the last ten years, the advent of commercial databases such as Lexis-Nexis and Westlaw, has astounded the legal world by demonstrating how technological advancement can significantly quicken the

research process. However, because Lexis and Westlaw are commercial systems and therefore charge on a per consumption basis, it is arguable whether they have actually made legal research cheaper. They do, however, illustrate the potential advances technology presents. To the extent a court purchases technology from a wholesaler of goods, rather than a retailer such as Lexis or Westlaw, as an investment, to improve the operations of the court and the litigation process, real long term gains in terms of cost and time savings can be achieved.

Starting with the beginning of the litigation process, filing the complaint, one of the big cost centers is paper. As seen above, electronic filing of complaints can virtually eliminate, if not significantly reduce, this cost.

The major costs associated with the pleading process are, again, paper, as well as the time and labor intensive process of drafting pleadings. Drafting pleadings can involve a multitude of tasks, including client interview, the entire discovery process, research, and the like. The technology discussed below shows ways in which the time and costs associated with each of these tasks can be significantly reduced through successful implementation of technology.

Assuming a case does not go to trial, discovery is probably the most expensive event of the litigation process. This is due to the often tedious and always labor intensive nature of discovery. Further, certain discovery techniques, such as depositions and document reviews, often require significant travel time and costs. Further, the voluminous paper trail left in the dust of the discovery process imposes ominous expenses in terms of labor and storage costs.

If a case does go to trial, the parties are sure to incur very significant expenses. Any effort to reduce the costs of the trial process should be welcomed with open arms. As luck would have it, most of the technologies discussed below will probably have their most significant cost/time saving effect on the trial process. Evidence preparation, evidence presentation, and record preservation are the areas in which technology's beneficial effects are most felt on the trial process. Let us now begin seeing where we can save significant time and money.

A. Electronic Judicial Desktop

The place to begin is with the judge's desktop. Much of the technology that will be discussed herein will require the judge as well as the attorneys to have personal computers at their desks. Nowadays, most attorneys, if they don't have a laptop themselves, will bring along an associate who does have his laptop ready to access information pertinent to the case. Yet, it is equally crucial for judges to tap into technology to take advantage of the tremendous economy of scale efficient use of technology presents. For judges and attorneys alike, personal computers provide portability to the entire discovery product, including pleading and legal research, via CD-ROMs and laptops. Now, what kind of technologies can be implemented when the courtroom is computer equipped for the high-tech communications that will most significantly reduce the time and costs associated with the litigation process?

B. Videoconferencing ²¹

Videoconferencing technology enables a court to conduct arraignments, pretrial release interviews, mental health hearings, pretrial conferences, and other events without requiring the parties to be at the same location. Consequently, in the criminal context, such technology helps local government staff to cut staff time and resources spent in transporting prisoners and reduces security risks in courthouses.

Court events, conferences, and meetings using videoconferencing are similar to those conducted when all parties are in the same room. Everyone sits in front of a television monitor and can see the parties at the other location. Further, videoconferences can include more than two locations. When there are multiple sites, monitor screens are split so each participant can see everyone else, or are switched using voice-activated microphones, so the current speaker is shown.

While videoconferencing technology seems a natural for a handful of court proceedings, such as mental health hearings, appellate court oral arguments, probation interviews, pretrial conferences, and the like, surprisingly courts have rarely sought effect uses of videoconferencing beyond arraigning prisoners.

Videoconferencing could enhance other court processes as well. For example, when attorneys have to meet with judges, costs associated with travel and waiting time could be eliminated if the meetings were conducted from their respective offices. Videoconferencing can eliminate the costs associated with time and travel for staff meetings, education, and administrative matters of the court. Further, videoconferencing can bring witnesses into the courtroom from remote locations, facilitating sensitive testimony from children and victims.

Videoconferencing technology could also be employed by counsel. Obvious likely uses for videoconferencing could be client interviews and consultations, depositions, and the like. Further, in the case of depositions, the proceeding could be recorded in real-time, for later use at trial or for the appellate record. This would alleviate the need for labor intensive transcript reporters.

One striking benefit of videoconferencing technology over telephonic communication is that the quality of videoconferencing communication is much better than communicating over the phone. Eye contact allows each individual to see a response and gage a reaction, to provide further information, ask a question, or try a different method of explanation. In short, there are certain drawbacks associated with telephonic communication that make it simply impractical in certain sensitive matters. Such drawbacks are substantially lessened with videoconferencing, thereby allowing videoconferencing to eliminate or lessen the impact of time, distance, and poor reception in communication. Court staff will no doubt function more effectively and efficiently to the extent this technology is implemented, thereby providing better service to the public at lower cost.

C. Telephone Conferencing [22](#)

A less advanced technology than videoconferencing, teleconferencing nonetheless presents some of the many benefits as videoconferencing. A 1983 report conducted by the Joint Project of the Institute for Court Management and American Bar Association provides an assessment of telephone conferencing in pilot courts in

Colorado and New Jersey after two years of use. The uncontested result of the program is that a high proportion of participants benefited from the new procedure.

Among the conclusions derived from the pilot program include:

- 1) a wide range of matters were handled by telephone conferences (e.g., in civil cases: substantive, discovery and procedural motions and related pretrial hearings);
- 2) attorneys saved both travel and waiting time;
- 3) civil litigants paid lower fees when their attorneys participated in telephone conferencing;
- 4) attorneys were highly satisfied with the program and did not perceive a quality difference in hearings;
- 5) judges had greater scheduling flexibility and shorter hearings;
- 6) the workload of court staff was not increased;
- 7) to be effective, the procedure had to be integrated into existing court practices.

Overall, the report found that approximately 70% of the hearings conducted by phone were pretrial motion hearings, while the remainder were pretrial conferences and settlement conferences. The use of telephone conferencing led to immediate savings in time and costs for attorneys. In general, time spent waiting for telephone hearings was usually 5-10 minutes whereas the average waiting time of in-court proceedings was 45 minutes. Average cost savings in terms of lower fees was estimated at \$130 and these savings, if attorneys billed by the hour, were passed on to clients.

Judicial attitudes toward telephone conferencing were extremely positive. Most claimed that the procedure saved court time because cases moved faster, were easier to schedule, and hearings were shorter. Some judges also mentioned that less time was spent waiting for attorneys. More importantly, most said that there was no difference in the relevancy of counsel's arguments used in telephone hearings; some even said that there was greater relevancy, because counsel had to be more precise in order to be effective over the phone.

Attorney attitudes about the program were similarly positive. The one disadvantage that was noted was that attorneys disliked being unable to gauge the judge's reaction over the telephone. For the most part, however, telephone conferencing proved to have more advantages than disadvantages. For example, it was now possible for attorneys from far away to deal with emergency situations, such as a matter that had to be resolved on short notice or within an allocated time period. Scheduling conflicts were avoided and a judge's absence from court (e.g., due to illness or trips) could be accommodated. Status conferences were conducted more often as judges could discuss cases with counsel on short notice.

The report also described the new procedure's effect on court operations. Individual calendars are used in New Jersey and Colorado. This means that each judge schedules his or her own calendar. Because telephone hearings could be conducted at times and on days not available for in-court hearings, judges had much greater flexibility in scheduling hearings at times convenient to all parties. Some judges even conducted matters during bench recesses. Overall, court operations were advantageously affected as court staff could spread work throughout the day and week rather than around concentrated times.

D. Electronic Document Delivery ²³

Discussion of this technology may seem redundant, as it was briefly mentioned above. Yet, in the above context, attorneys were sending information to courts. This technology can be implemented to reduce the costs of litigating when opposing counsel are communicating with each other during the discovery and other stages of litigation.

The largest impediment to using computers to store and retrieve information is getting the information into the system in the first place. The procedures to input information are often redundant and unnecessarily costly to the client. For example, federal courts require that answers or objections to interrogatories include a verbatim recital of the original interrogatory. This mandates re-keying text into a new document that was originally keyed in at the opposing counsel's office once before. Attorneys can scan in important documents, but this still involves the significant cost of entering the information. The key component of this proposal requires that participating firms send magnetic (electronic) copies along with any document they send or serve on a participating opposing party. These magnetic copies can be sent along with the original document, or transmitted electronically.

If implemented, this proposal will reduce the time to locate files, review and identify relevant information in the litigation process. It will substantially increase the ability to index and organize documents. It will also reduce the amount of re-keying of text in motions and other pleading where verbatim reproduction of existing text is required.

The cost of implementing the proposal is extremely low, especially in comparison to the economies of labor that it creates. If diskettes are used, the cost is insignificant. The only real cost of the proposal is the extra moments necessary to save the file to the diskette, and the extra mailing and labor. These costs are also insignificant compared to the labor, attorney time and cost saved in reviewing these files and drafting documents that incorporate existing text.

E. Service Of Process By Fax ²⁴

Reviewing the capabilities of currently available fax machines, past uses of fax, and similar methods for delivering notice relative to the requirements of due process, it is clear that service of process by fax is on firm legal footing. As it will speed litigation by making delivery of initial and mesne process quicker, it should be adopted as an alternative method of serving process.

1. Practicable and Reliable

Delivery of information by fax is certain because the fax is sent to a telephone number, which the sender has the burden to ascertain, and which is relatively unique. There is intercommunication between the fax machines during transmission, providing monitoring of transmission quality and completion. For the user the fax machine can produce a tangible record of when and where transmissions were sent, and whether the message was successfully received. The

fax produces an exact copy of the original document at the distant receiver, quickly and with no damage to the original.

The protocol functions and transaction report features of a fax give the sender immediate knowledge of the success or failure of delivery to the desired recipient. The commonly used methods for service take time to accomplish and more time for the results to become known to the serving party. The fax machine gives the sender the ability to send the documents and have the copy arrive at the recipient almost simultaneously.

By using fax, the process server's often-difficult job of finding or getting access to a particular person will be greatly reduced, along with the costs of personal service. Use of fax will also eliminate problems with mailed service of process, such as recipients refusing delivery of certified or registered mail. Faxed service of process could be unannounced and consequently almost unavoidable. If the wrong person receives the service, there could be a requirement that a cover sheet must accompany the fax, listing the sender's telephone number for immediate response by these inaccurate recipients.

Further, the continued availability of other methods will increase the serving party's flexibility in choosing methods for service.

2. Due Process

If a method of transmitting notice exists which is inexpensive, fast, and reasonably certain to deliver information to the person intended to receive it, such that a "prudent business" would use that method to inform those with whom he deals, the constitutional standard for notice and for service of process, as set forth in *Mullane v. Central Hanover Bank* [25], will be satisfied and a plaintiff will be allowed to use that method to serve process.

Fax is widely used in the business community for numerous transactions between parties. The rapid growth of fax use points to its reliability and acceptance by "prudent businessmen" worldwide, and their reliance upon it.

3. Benefits

Adding the fax machine to the list of methods approved for serving initial and mesne process in civil cases will speed the service, remove uncertainty of the process' arrival, and eliminate the need for personal service in most cases. Allowing use of fax for serving initial process will yield considerable savings for attorneys and clients, both in time and in money. While doing this, fax service carefully used will preserve the adequate notice rights of the defendant. Fax service of process will cut the costs of litigation and give plaintiffs another way to reach evasive defendants. With respect to serving mesne process, allowing service by fax is already on the way to widespread acceptance and will result in widespread savings of time and expense.

4. Some States That Use Such A Procedure

New York, Oregon, Idaho, Montana and Utah allow service of process or notice by

the use of telegraphic or telephone facsimile. The statutory provisions of Idaho, Montana and Utah which allow for such a procedure all state that the process is to be reproduced after being transmitted by telegram or telephone, and the reproduction is then to be served personally on the defendant.

Similarly, in the author's proposed statute, based upon Utah Rule of Civil Procedure 4(l) and the revisions to Oregon Rule of Civil Procedure 9, the plaintiff-sender is required to send on the same day a copy of the original summons and complaint to the defendant by ordinary mail together with copies of the affidavit of service and the transaction report. Service will date from the date that the fax is sent.

F. Video-Text Integration ²⁶

The initial set up usually begins with real-time, a process that translates a court reporter's stenographic notes and instantly displays the testimony on computer screens placed around the courtroom. To integrate the video record and text record of trial proceedings, the testimony of each witness is videotaped by a camera focused in on the witness stand. Stenographic text of the proceedings taken down by the court reporter is translated by real-time and fed as a data stream through a smart encoder that puts it into an integrated format so that the testimony appears alongside, or below the video record of what takes place in the courtroom. An internal clock in the video camera or VCR is connected and synchronized with the court reporter's computer to ensure that the video record and text record of trial proceedings match.

Video-text integration technology allows the court and counsel to search both the text and the video together. Therefore, if you do a computer search for a word, the computer will not only find that particular reference in the text, but it will find the coinciding portion of the video.

The advantages posed by this technology are enormous. First, jury read backs are significantly sped up. No longer will the court reporter be fishing through miles of testimony to locate the specific portion of text requested for read back by the jury. More significantly, this technology allows the jury to have a "view back." The jury will again be able to experience the witness's expression, movement, voice intonation, and general delivery of testimony; all things that were once lost forever when the jury was able only to hear the witness's words read back by the monotone court reporter. In essence, this technology allows the witness's words to be placed back in context, preserving in the words all the meaning which the words alone cannot retain when the reporter reads them back.

Another significant advantage offered by this technology is that it allows different ways for attorneys and the judge to take notes on the screen with coding and annotations. Attorneys can press one key to differentially mark important testimony. They can then add unlimited notes and mark portions of the text with their own codes without affecting the integrity of the transcript. Attorneys can also perform searches for specific words, phrases, and other more complicated information in one or more documents simultaneously.

Finally, this technology allows judges and attorneys to pull up prior testimony in a

split-screen window. On one side of the screen is the witness's current testimony, which the judge or attorney can compare to the witness's prior testimony, which appears on the other side of the screen. Further, since the video camera films the entire trial as it takes place, testimony from earlier in the trial, found quickly using a text search, can also be called up and retrieved.

G. Speech Recognition Technologies

Speech recognition technology replaces a computer keyboard with a microphone and software to change the spoken word into typed characters. The PC, using its speech recognition software, interprets information received through the microphone and presents it to other computer applications as if it had been entered on the keyboard. As the user says a word, the computer analyzes the sounds and compares them to a dictionary of tens of thousands of words. When a match is made, the program passes the characters to the word processor or other PC application (e.g., Westlaw, see below). The computer also lists a list of other possible matches in a pop-up dialogue box on the screen, in case the word it has chosen is not the correct word. If the word is correct, the user simply continues; if the word is not, the user selects the correct word from the box; if the word is not in the box, the user enters spell mode and adds the new word to the dictionary. The most impressive aspect of this technology is its ability to apply artificial intelligence software to learn from its mistakes. The incidence of incorrect word selection diminishes rapidly as the speaker continues. This technology is ideal for court staff with physical impairments or those who lack typing skills above 50 words per minute.

While accuracy has remained at 95 to 97 percent for discreet, or single-word recognition, costs have declined from the tens of thousands to a few hundred dollars, and dictionaries have grown to over 60,000 words. Meanwhile, speed has increased from about 30 words per minute to 90 words per minute, approaching the normal speaking pace of 120 words per minute.

1. Opportunities

Speech recognition makes staff more productive. Information can be entered into a computer while the user is doing other tasks, such as opening mail, going through the file, etc. For inexperienced typists, speech recognition systems can minimize the need for secretarial support in transcribing dictation and drafting documents, while allowing the disabled to work at jobs that would be impossible to perform productively without using a keyboard.

Speech recognition will be the long-term alternative to present labor-intensive methods of capturing the court record and producing transcripts.

2. Voice-Compatible Westlaw

West Publishing has combined Westlaw with LawTalk, a legal dictation program. The result is voice-compatible Westlaw, with which subscribers will be able to conduct legal research by speaking into a microphone, eliminating the need to type commands or search queries on a keyboard. The product complements Westlaw's Natural Language search system.

Any number of users can work with the same system, since each user's voice pattern can be saved as a separate computer file. Further, West developers report that dictation speeds of 65 words per minute are attainable once the system has thoroughly learned a user's voice.

The main benefit of the program is that it increases productivity. Voice-controlled Westlaw also has applicability to any DOS program, so you can talk your computer through word processing, database and spreadsheet work too. In other words, anything you needed a keyboard for can now be done with voice commands. Thus, Westlaw users can take advantage of the system's ability to conduct research, as well as to create legal documents, all by voice commands, which is a blessing for those of us with less than masterful typing skills.

West's main competitor, Mead Data Central, says it plans to release a voice-activated version of its Lexis-Nexis service in the near future.

H. Rule-Based Expert Systems [27](#)

While artificial intelligence (AI) applications, computers programs that perform tasks requiring some amount of human-like intelligence, have not thus far been widely used by either practicing attorneys or by the judiciary, modest attempts to use AI in the legal world and extensive research in the field of AI and law strongly suggest that AI applications, in particular rule-based expert systems, have the potential of enhancing both the efficiency and fairness of our judicial system.

The benefits of rule-based expert systems include: (1) greatly reduced time and expense for developing and modifying programs; (2) the ability of judges and attorneys with minimal computer background to understand how computer programs work and contribute directly to their development; (3) automated "explanation" ability, which allows users to ask the computer to explain its behavior; and (4) the ability to work through "what if" scenarios quickly and easily -- expert systems have the same power to manipulate symbolic rule structures that spreadsheets have for numeric tables.

1. Two Case Studies: JEDA and Law Clerk

JEDA (Judicial Expert Decision Aids) is a rule-based expert system designed for administrative law judges who decide Black Lung cases. The program identifies the issues involved in a specific class of case, the relevant evidence, and the findings required to be made in the case. The benefits of the program are many:

- 1) helps to ensure that the reasoning is consistent with the law;
- 2) provides references to apposite citations;
- 3) suggests possible decisions based on intermediate findings entered either by the judge or inferred from the rules; and
- 4) generation of relevant text for inclusion in a final decision.

Thus, though the program does not "decide" the cases, it automates that part of the decision-making process that requires the manipulation of complex rules thereby leaving the judge more time to resolve open ended questions involving

interpretation, ambiguity, and credibility of evidence.

Law Clerk is a rule-based document generator which built upon the accomplishments of JEDA. Law Clerk assists administrative law judges who decide cases involving allegation of fraud in obtaining food stamp benefits. The system first elicits information on the prima facie elements of fraud:

Did Jones [the applicant] have unreported employment income?

Supporting evidence: The Denver Food Stamp Fraud Office alleged that Jones had unreported employment income and had canceled pay checks to support the claim.

Negating evidence: Jones denied having unreported employment income.

At all times, the judge can ask the program to explain why it is asking particular questions:

Why am I trying to determine whether Jones applied for food stamp benefits?

I'm trying to determine whether Jones committed an intentional program violation.

This conclusion would be supported under Sec. B-4425.1.1 from the following:

Jones applied for food stamp benefits.

Jones made a false or misleading statement, or misrepresented, concealed or withheld facts.

The output of Law Clerk is a draft judicial opinion based on the consultation.

Though Law Clerk was implemented only in the context of fraud in obtaining food stamp benefits, this rule-based expert approach can be adapted to many legal domains. The researcher who developed Law Clerk concluded that the use of these types of systems only made sense where there are (1) a predictable set of issues; (2) a high volume of cases; and (3) a variable combination of issues so that simpler types of text generation techniques are not practical.

2. Rule Based Expert Systems Can Facilitate Early Settlement of Cases

Judges often attempt to facilitate early settlement of cases, either through the use of pretrial conferences or various ADI models. AI systems can contribute to this process by giving the parties a more accurate assessment of the costs and benefits of litigation. Since AI systems allow the parties to create models that test a wide range of assumptions, lawyers and clients are better able to assess the value of a settlement offer.

A study funded by the insurance industry in the early 1980s investigated the application of expert systems to evaluating product liability insurance claims. A computer scientist and a lawyer at Rand Corporation, after spending many hours observing and talking with expert insurance adjusters and litigators, created a sophisticated rule-based system that combined substantive elements of the product liability domain (e.g., "how much does disfigurement increase the settlement?"), legal questions (e.g., contributory negligence versus strict liability), and practical trial expertise (how badly does plaintiff need a quick settlement?) to reach a recommended settlement value. The system was evaluated and its performance was adjudged to be comparable to expert insurance adjusters.

3. Rule Based Expert Systems Can Assist in Court Administration

AI technology has the potential of making court systems operate more efficiently. Montgomery County, Pennsylvania, employs neural net technology to predict the number of jurors needed for a day's activities based on prior data on juror utilization. With more accurate forecasts based on data about guilty pleas, settlements, party unavailability, etc., the system saved the county \$40,000 annually, and improved relations with potential jurors who often become annoyed when they are summoned and then dismissed. The same technology could be used to help judicial administrators schedule trials more precisely by intelligently processing data about the type of case, jury or nonjury trial, number of witnesses, attorneys involved, and the presiding judge. AI technology can thus help judicial administrators lower the costs and improve the performance of their court systems.

I. Document Assembly

Though a derivative of the rule-based expert system, document assembly deserves separate treatment, first because it has enjoyed much more acceptance in the legal community, and second because its focus is aimed more toward lowering the costs of civil litigation to the consumers of legal services: the clients of lawyers.

A young couple comes into your office and asks you to draft a will for them. Yet, all they can afford to pay is \$150 for the service. Assume you bill \$75 an hour (a very conservative assumption) and the process will take you around four hours - talking to the couple for an hour and a half, finding a sample will, customizing it and dictating it to your secretary, and then an hour for the couple to execute it - that's \$300. You have lost money and spent valuable time.

Because modern legal practice is full of repetitive contracts, pleading and other types of "forms," practicing law can often mean performing tedious, time-consuming, and repetitive tasks. Instead of hoping they will go away, why not make them an even smaller part of your practice, thereby improving service to clients, keeping costs down, and generating additional profits. How can an attorney do this? Think about the tasks at which a computer truly excels: computers are effective at performing tedious chores or eliminating time-consuming, repetitive tasks. Sound familiar?

Document assembly is a particularized form of what is known as a rule-based expert system. Essentially, with document assembly, the system makes decisions based on legal rules and logic built into the computer. The software asks the user a series of questions, and depending on the answers, either omits other questions or continues asking until it has enough information to enable it to make a legal decision. The software has the ability to clarify why choices or decisions were made, and reject legally incorrect answers. When the process is complete, draft documents are printed out for the user's review and revision.

A lawyer who must engage in many different types of transactions is a natural for document assembly because rather than having to re-learn an area every time, the system will walk you through the process. It never forgets, and acts as a checklist and saves you lots of time, thereby pleasing your client in terms of both quality and cost of service.

These systems range from obvious practice areas to some that may surprise you. For example, some firms have systems for commercial leasing, bond issues, oil and

gas leasing, ERISA plans, blue-sky offerings, labor pleading, federal court pleading and corporate dissolutions. In addition, many firms have systems for wills and trust, conveyancing, foreclosure, collections, bankruptcy, domestic relations and incorporations.

In a day when clients are on a quest for greater value for each dollar they spend on legal fees (i.e., they want to reduce their legal fees), value billing methods such as flat fees, blended rates, fee caps, modified contingency fees, etc., have become much more common fee arrangements. Firms that find ways to deliver ways to delivery their legal product more efficiently can actually profit from value billing arrangements. Document assembly can help firms be more efficient.

Now when these couples come in, you talk to them for an hour, knock the will out in 10 or 15 minutes, maybe do a little bit of editing on the word processor, call them back in and execute it.

J. Text-, Graphics-, and TV-Capable Jury Computers [28](#)

There is no doubt that the average juror is used to getting his or her information from the video screen (i.e., the television, and, increasingly, the computer). Attorneys now have the means to likewise present evidence in this manner. Using video players and large-screen color monitors or projection screens, a lawyer can present jurors with persuasive images of documents, photographs, cutaway views of products, animated re-creations of events, charts, diagrams, and maps. Monitor screens can also show videotaped depositions, filmed accident or crime sites, and virtually any other type of information that can be visualized. Recall the nightly news clips during the O.J. Simpson trial showing witnesses looking down at a monitor to view documents or photographs.

We have already covered some of the benefits which arise from using computers in preparation, discovery, and trial: Computers can scan documents, photographs, and charts into computer-readable memory; store databases and summaries of evidence; link deposition text to document images for instant retrieval; and search documents for dates, names, or other search factors. There are likewise many benefits associated with computer-assisted displays:

- 1) They focus jurors' attention on crucial evidence as testimony about it is given;
- 2) The technology minimizes awkward delays during cross-examination while the attorney locates relevant pages or paragraphs in a document;
- 3) They allow the attorney to integrate images of documents, photos, videos or text of depositions, and animations [\[29\]](#) seamlessly on the same computer monitor;
- 4) Reduce witness evasiveness, because everyone in the courtroom can study the same document simultaneously;
- 5) They allow attorneys to highlight key information, for example, by using a light pen on the monitor. The attorney can circle or underline selected text or parts of photographs. The marked-up page can be saved and printed, thus preserving for the appellate record the views and markings the jury saw at trial; and
- 6) They allow attorneys to improve the legibility of hard-to-read documents by

zooming onto details or in displaying the handwriting in "reverse video" (white writing on black background).

K. Kiosks

Kiosks provide an alternative method of delivering court services to the public without the necessity of staff assistance or the use of staff resources. A court kiosk is a high-speed personal computer, usually encased in an ATM-type electronic kiosk, which provides users information about court procedures and legal terminology, the aim of which being to better inform individuals about the judicial process. The technology can present information in the user's native tongue, explain the legal consequences of various circumstances, and assist the user in preparing documents to file with the court.

1. Benefits

There are numerous benefits associated with implementation of a kiosk system by courts. They include:

- 1) Kiosks reduce the cost and time spent by personnel in dealing with the public. Because so many matters can be handled outside the court and outside normal business hours, those who must visit the courthouse are served more promptly.
- 2) Allowing scheduling and continuing court events, accepting pleas, and allowing submission of proof of insurance, roof of repair, and similar documentation to be handled by kiosks reduces the burden on court calendars.
- 3) Routine matters can be completed without the intervention of attorneys, saving the public additional time and money.
- 4) Kiosks provide higher quality service. Basic information, given quickly and consistently, is directed to the exact needs of the user in a manner that does not discern ethnicity, gender, or age. Because the information exacted from kiosks have been thoroughly researched and tested, the information on the computer screen will be correct and can be reviewed and corrected as often as necessary.
- 5) Kiosks allow court staff to be more productive because they spend less time on routine, repetitive activities. Yet, because these are long-term savings, the system must operate for a few years in order that the resources saved by the technology exceed the initial cost of development and implementation of the kiosk system.
- 6) Kiosks greatly increase public access to the court. Through kiosks, court services are available any time, day or night, at convenient locations, and in the user's native tongue. Kiosks also increase the public's understanding of and satisfaction with the judicial system.

2. Arizona's QuickCourt

Arizona's system, housed in a kiosk similar to bank ATM machines and located at three court sites, is designed to improve public access to, understanding of, and satisfaction with the courts. The system is also expected to reduce the expenses of litigation, the delay in court proceedings and the paper volume that court staff deals with on a day to day basis.

QuickCourt has on-screen directions written at a fourth-grade reading level, with flashing boxes and words, as well as the explicating actor. The system has a legal

dictionary to define any terms a user might not understand, and is bilingual (English and Spanish).

The system gives users information on uncontested divorces, landlord-tenant problems, small claims, alternative dispute resolution, and other relatively simple topics. The computer explains things, asks the right questions and, ultimately, prints out a completed form ready to file with a court clerk. Court employees report that most people use the system for uncontested divorces.

Initially, there was some concern that the system would take business away from lawyers, however, since this concern initially surfaced, the realism set in that most of the users are those who could not afford to hire an attorney even if that were the only option. As such, the real losers with QuickCourt and other kiosk systems designed to improve public access to the courts at a lower cost are the "self-help kits."

L. Trials on Videotape

At the furthest extreme of the technological revolution in the courtroom is the court of Judge James McCrystal, a state trial court judge in Sandusky, Ohio, who was among the first to conduct paperless civil trials. The way he works this is that in many cases, all testimony and lawyer's questions, statements, and arguments are prerecorded. Afterwards, the judge deletes inadmissible statements or improper questions - any parts of the trial that are not to be shown to the jury. Once edited, the videotaped "trial" was shown to the jury in a viewing room as one continuous tape of question-and-answer.

IV. Conclusion

Our legal system is the result of more than two centuries of our own legal development in addition to the many centuries of development of English law. In other words, some of our staunchest notions of how best to run our legal society have their roots in history and culture. Further, the nature of our legal system is conservative because ours is a legal system based on following precedent. Thus, to the extent things do change, they change slowly. Yet, there comes a point when the necessity to implement change becomes striking and this is the point when change must occur.

In our litigious society, the costs of asserting one's rights have become enormous to the average citizen. As a result, access to the courts has to some extent become more restrictive. This is a sad consequence. We are now at that point when the necessity to implement change is striking.

Technology is advancement. We advance when we can perform tasks better, more efficiently, and at lesser costs. Therefore, one way to implement the changes necessary to decrease the costs of civil litigation is to utilize technology. Fortunately, there are proven technologies on the market which, if successfully implemented, can indeed significantly increase the efficiency of many of the mundane tasks associated with law practice. The opportunity to make these changes is upon us.

Reducing the Costs of Civil Litigation

Using New Technologies

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Technology Descriptions

NOTE: Electronic Judicial Desktop

* Much of the technology that will be discussed herein will require the judge as well as the attorneys to have personal computers at their desks. It is crucial for judges to tap into technology to take advantage of the tremendous economy of scale efficient use of technology presents.

* For judges and attorneys alike, personal computers provide portability to the entire discovery product, including pleadings and legal research, via CD-ROMs and laptops.

I. Court Management

* Successful implementation of technology in the area of court management and administration will significantly reduce staff time spent on these tasks while at the same time increasing the accuracy and consistency of court files. Thus, greater quality of service will be provided to the public at lower cost.

A. Case Management Systems

* A successfully implemented automated case management system is the first essential requirement in a court system whose aim is to implement technology in order to increase efficiency and save time.

* Case management systems are packages of computer software that accelerate the work of the court because they automate the collection, organization, processing, storage, and distribution of data within the court and to external agencies. Consequently, these systems perform these tasks much faster, with greater accuracy, and at a lower cost than manually.

B. Judicial Electronic Document and Data Interchange (JEDDI)

* The goal of JEDDI is to facilitate the electronic exchange of written information in an organized manner for the legal community.

* JEDDI is composed of the implementation of electronic filing technology, which allows courts to receive pleadings, motions, briefs, etc., in an electronic format, and provides accessible, up-to-date information. Lawyers can make, in turn, send these materials without leaving their offices. JEDDI is quite literally the parent of the paperless court.

* Main Benefits of JEDDI

- Computers can move documents into court faster, less expensively, and with greater security than traditional modes of paper document delivery. Users send information simultaneously to multiple parties 24 hours a day with the "flip" of a button, greatly reducing photocopy and postal charges.
- Electronic filing of computerized documents allows for the automatic entry of information into a case management system, reducing data entry time and eliminates errors.
- Computers are faster and less expensive than humans for doing the nitty-gritty work of document retrieval, including the ability to access hypertext functions to look up a citation. These capabilities save the time and effort of pulling paper files or volumes off shelves, flipping pages, and replacing the files or volumes.
- Storing and sending the case file electronically allows the case file to be searched by computer for certain words or phrases. Further, the potential time and cost savings of this capability increases to the extent critical and often-used information is stored electronically. For example, the Alabama Supreme Court has stored its opinions and other work on a text database system called ZyIndex. The court has full retrieval capabilities without the cost of using commercial database services.
- Remote access to the court's official case file greatly benefits lawyer and court efficiency, allowing the lawyer to work after everyone at court has gone home and allowing the courthouse to receive filings 24 hours a day.
- Finally, computer-readable documents can interact with other computer-based systems. In electronic form, documents transfer data into a database without the errors, high costs, and time lags associated with human data entry.

* Hypertext

- The principle of hypertext is that each electronic document should include not only text but also pointers to other related items. As you read the text and find yourself interested in the related materials, you can "click" on them with your mouse and instantly retrieve the related documents on your screen. You can then explore yet other materials that are pointed to by the retrieved documents. When you're done exploring, you can easily return to where you began.
- Attorneys could create hypertext outlines to link their key points to phrases in the documents, statutes, and case precedents. Electronic documents would broaden these applications significantly.

C. Electronic Public Access Systems (EPAS)

- * EPAS provides remote access to a court's information systems via PCs and modems, allowing remote users in some cases to view the same information that court clerks have on hand. The convenience of 24-hour access to court records, dockets, and calendars is clear. This convenience is especially realized in rural areas and multijurisdictional cases.

D. Internet

- * What is the Internet? A vast international network of computer networks connected via telephone lines, microwave links and satellite links that allows the user to contact other users worldwide and offers access to a huge repository of information, including vast quantities of legal information.

* Courts and the Internet

- Courts should "E-publish" court decisions, along the lines of Alaska's "Touch N' Go System," whereby the state downloads and republishes all the state Supreme Court decisions. Such would allow immediate access to these decisions without the hassle of going to the nearest law library and pulling down a case reporter or the cost of logging onto to a commercial database, such as Lexis or Westlaw.
- Courts should also publish a "frequently asked questions" (FAQ) publication. Courts fields the same types of phone calls over and over and over. Providing this information over the internet would no doubt improve access to the courts. While this may not result in a reduction of calls being received by courts, callers using the system would no doubt be more informed, thus enabling their requests to be processed more quickly and effectively.
- Finally, courts should maintain a home page with pointers to all the law-related sites in their jurisdiction.

E. Imaging

* Imaging consists of making a computerized picture of a document using a scanner. After the quality of the image is verified, it is indexed (connected electronically by appropriate software to a court case) so it can be retrieved with the specific case. After indexing is complete, the document is placed in the paper file and the image is committed to electronic storage.

* Benefits of Imaging:

- Immediate, concurrent access to court records.
- Fewer documents are lost because original records almost never leave the file room. Further, because they are handled only once, misfiling is rare, and because the original papers are rarely touched, they are more secure and preserved in better condition.
- The productivity of court staff should improve with imaging because less time is spent filing and handling paper and routing work. Computerized work flow produces more uniform operations and creates automatic audit trails, leading to better monitoring of cases and staff performance.

II. Pleadings

A. Service Of Process By Fax

* Delivery of information by fax is efficient and certain because the fax is sent to a telephone number, which the sender has the burden to ascertain, and which is relatively unique, intercommunication between the fax machines during transmission provides monitoring of transmission quality and completion, the fax machine can produce a tangible record of when and where transmissions were sent, and whether the message was successfully received, and the fax produces an exact copy of the original document at the distant receiver, quickly and with no damage to the original.

* The commonly used methods for service take time to accomplish and more time for the results to become known to the serving party. The fax machine gives the

sender the ability to send the documents and have the copy arrive at the recipient almost simultaneously.

* By using fax, the process server's often-difficult job of finding or getting access to a particular person will be greatly reduced, along with the costs of personal service. Use of fax will also eliminate problems with mailed service of process, such as recipients refusing delivery of certified or registered mail. Faxed service of process could be unannounced and consequently almost unavoidable.

B. Electronic Document Delivery

* Implementing electronic document delivery involves sending magnetic (electronic) copies along with any document attorneys send or serve on a participating opposing party. These magnetic copies can be sent along with the original document, or transmitted electronically.

* Will reduce the time to locate files, review and identify relevant information in the litigation process. It will substantially increase the ability to index and organize documents. It will also reduce the amount of re-keying of text in motions and other pleadings where verbatim reproduction of existing text is required.

C. Speech Recognition Technologies

* Speech recognition technology replaces a computer keyboard with a microphone and software to change the spoken word into typed characters.

* While accuracy has remained at 95 to 97 percent for discreet, or single-word recognition, costs have declined from the tens of thousands to a few hundred dollars, and dictionaries have grown to over 60,000 words. Meanwhile, speed has increased from about 30 words per minute to 90 words per minute, approaching the normal speaking pace of 120 words per minute.

* Benefits of Voice Recognition Software:

- Speech recognition makes staff more productive. Information can be entered into a computer while the user is doing other tasks, such as opening mail, going through the file, etc.

- For inexpert typists, speech recognition systems can minimize the need for secretarial support in transcribing dictation and drafting documents, while allowing the disabled to work at jobs that would be impossible to perform productively without using a keyboard.

- Speech recognition will be the long-term alternative to present labor-intensive methods of capturing the court record and producing transcripts.

* Voice-Compatible Westlaw

- Subscribers will be able to conduct legal research by speaking into a microphone, eliminating the need to type commands or search queries on a keyboard. The product complements Westlaw's Natural Language search system.

D. Document Assembly

* Document assembly is a particularized form of what is known as a rule-based expert system. Essentially, with document assembly, the system makes decisions based on legal rules and logic built into the computer. The software asks the user a series of questions, and depending on the answers, either omits other questions or continues asking until it has enough information to enable it to make a legal decision. The software has the ability to clarify why choices or decisions were made, and reject legally incorrect answers. When the process is complete, draft documents are printed out for the user's review and revision.

III. Discovery

A. Electronic Document Delivery.

B. Videoconferencing

* Videoconferencing technology enables a court to conduct arraignments, pretrial release interviews, mental health hearings, pretrial conferences, and other events without requiring the parties to be at the same location.

* Videoconferencing could enhance other court processes as well. For example, when attorneys have to meet with judges, costs associated with travel and waiting time could be eliminated if the meetings were conducted from their respective offices. Videoconferencing can eliminate the costs associated with time and travel for staff meetings, education, and administrative matters of the court. Further, videoconferencing can bring witnesses into the courtroom from remote locations, facilitating sensitive testimony from children and victims.

* Videoconferencing technology could also be employed by counsel in client interviews and consultations, depositions, and the like. Further, in the case of depositions, the proceeding could be recorded in real-time, for later use at trial or for the appellate record. This would alleviate the need for labor intensive transcript reporters.

* One striking benefit of videoconferencing technology over telephonic communication is that eye contact allows each individual to see a response and gauge a reaction, to provide further information, ask a question, or try a different method of explanation.

C. Telephone Conferencing

* A wide range of matters were handled by telephone conferences (e.g., in civil cases: substantive, discovery and procedural motions and related pretrial hearings).

* The many benefits include:

- Attorneys saved both travel and waiting time.
- Civil litigants paid lower fees when their attorneys participated in telephone conferencing.
- Generally, attorneys do not perceive a quality difference in hearings as a result of telephone conferencing.
- Judges have greater scheduling flexibility and shorter hearings;

- According to a 1983 study, time spent waiting for telephone hearings was usually 5-10 minutes whereas the average waiting time of in-court proceedings was 45 minutes. Average cost savings in terms of lower fees was estimated at \$130 and these savings, if attorneys billed by the hour, were passed on to clients.
- Because telephone hearings can be conducted at times and on days not available for in-court hearings, judges have much greater flexibility in scheduling hearings at times convenient to all parties.

D. Video-Text Integration

* To integrate the video record and text record of trial proceedings, the testimony of each witness is videotaped by a camera focused in on the witness stand. Stenographic text of the proceedings taken down by the court reporter is translated by realtime and fed as a data stream through a smart encoder that puts it into an integrated format so that the testimony appears alongside, or below the video record of what takes place in the courtroom. An internal clock in the video camera or VCR is connected and synchronized with the court reporter's computer to ensure that the video record and text record of trial proceedings match.

* Video-text integration technology allows the court and counsel to search both the text and the video together. Therefore, if you do a computer search for a word, the computer will not only find that particular reference in the text, but it will find the coinciding portion of the video.

* The advantages posed by this technology are enormous:

- Jury readbacks are significantly speed up. No longer will the court reporter be fishing through miles of testimony to locate the specific portion of text requested for readback by the jury.
- This technology allows the jury to have a "viewback." The jury will again be able to experience the witness's expression, movement, voice intonation, and general delivery of testimony.
- Allows different ways for attorneys and the judge to take notes on the screen with coding and annotations, without affecting the integrity of the transcript.
- Attorneys can also perform searches for specific words, phrases, and other more complicated information in one or more documents simultaneously.
- Allows judges and attorneys to pull up prior testimony in a split-screen window. On one side of the screen is the witnesses current testimony, which the judge or attorney can compare to the witness's prior testimony, which appears on the other side of the screen.

E. Speech Recognition Technologies

IV. Settlement Conferences

A. Rule-Based Expert Systems

* Rule-based expert systems ask the user to answer certain types of questions which will identify the issues involved in a specific class of case, the relevant evidence, and the findings required to be made in the case.

* These systems have various benefits:

- Automated "explanation" ability, which allows users to ask the computer to explain its behavior.
- Ability to work through "what if" scenarios quickly and easily.
- Help to ensure that the reasoning is consistent with the law.
- Provide references to apposite citations.
- Suggest possible decisions based on intermediate findings entered either by the judge or inferred from the rules.
- Generate relevant text for inclusion in a final decision.
- Facilitate early settlement of cases by giving parties a more accurate assessment of the costs and benefits of litigation, as well as their likely chances of victory.
- Assist in court administration by making predictions such as the number of jurors needed for a day's activities, likely length of certain trials, etc.
- In general, they have the potential of enhancing both the efficiency and fairness of our judicial system.

V. Trial

A. Videoconferencing

B. Telephone Conferencing

C. Video-Text Integration

D. Speech Recognition Technologies

E. Rule-Based Expert Systems

F. Text-, Graphics-, and TV-Capable Jury Computers

* Using video players and large-screen color monitors or projection screens, a lawyer can present jurors with virtually any type of information that can be visualized.

* The many benefits associated with computer-assisted displays include:

- Focuses jurors' attention on crucial evidence as testimony about it is given.
- Minimizes awkward delays during cross-examination while the attorney locates relevant pages or paragraphs in a document;
- Allows the attorney to integrate images of documents, photos, videos or text of depositions, and animations seamlessly on the same computer monitor;
- Reduces witness evasiveness, because everyone in the courtroom can study the same document simultaneously;
- Allows attorneys to highlight key information, for example, by using a light pen on the monitor. The marked-up page can be saved and printed, thus preserving for the appellate record the views and markings the jury saw at trial.
- Allows attorneys to improve the legibility of hard-to-read documents by zooming onto details or in displaying the handwriting in "reverse video" (white writing on black background).

G. Trials on VideoTape

* All testimony and lawyer's questions, statements, and arguments are prerecorded. Afterwards, the judge deletes inadmissible statements or improper questions - any parts of the trial that are not to be shown to the jury. Once edited, the videotaped "trial" was shown to the jury in a viewing room as one continuous tape of question-and-answer.

VI. Alternative to Litigation

A. Kiosks

* A court kiosk is a high-speed personal computer which provides users information about court procedures and legal terminology, the aim of which being to better inform individuals about the judicial process, explain the legal consequences of various circumstances, and assist the user in preparing documents to file with the court.

* There are numerous benefits associated with implementation of a kiosk system by courts, including:

- Kiosks reduce the cost and time spent by personnel in dealing with the public. Because so many matters can be handled outside the court and outside normal business hours, those who must visit the courthouse are served more promptly.
- Allowing scheduling and continuing court events, accepting pleas, and allowing submission of proof of insurance, roof of repair, and similar documentation to be handled by kiosks reduces the burden on court calendars.
- Routine matters can be completed without the intervention of attorneys, saving the public additional time and money.
- Because the information exacted from kiosks have been thoroughly researched and tested, the information on the computer screen will be correct and can be reviewed and corrected as often as necessary.
- Kiosks allow court staff to be more productive because they spend less time on routine, repetitive activities.
- Kiosks greatly increase public access to the court. Through kiosks, court services are available any time, day or night, at convenient locations, and in the user's native tongue. Kiosks also increase the public's understanding of and satisfaction with the judicial system.

Notes

[1] M. Ethan Katsh, Technology and the Future of Law in a Digital World, reviewed in Eugene Volokh, *Review Essay: Technology and the Future of Law in a Digital World*, by M. Ethan Katsh, 47 Stan. L. Rev. 1375, 1377 (1995). ([return to text](#))

[2] The following on Case Management Systems is significantly based on the National Center for State Courts' "Court Technology Briefing Papers: Case Management Systems." ([return to text](#))

[3] James E. McMillan, Courts in the 21st Century: Toward the Electronic Court,

TRIAL, October 1995, p. 19. ([return to text](#))

[4] The following discussion is taken substantially from David J. Egar, *Electronic Filing*, Fourth National Court Technology Conference, National Center for State Courts, October 1994, and Mark Curriden, *Courtroom of the Future is Here: Technology Conference Showcases High-Tech, Paperless Courts*, ABA Journal, January, 1995. ([return to text](#))

[5] McMillan, *Trial*, Oct. 1995, pg. 21. ([return to text](#))

[6] My discussion of the benefits of electronic filing of case file documents is based heavily upon Alan Asay, *Electronic Filing of Case File Documents*, Article prepared for Fourth National Court Technology Conference, National Center for State Courts, October 1994. ([return to text](#))

[7] See *Imaging Technology ahead*. ([return to text](#))

[8] The following catalogue of usage of the CLAD system was found in *Electronic Dockets As Wave of Future: Courts Eliminate Paperwork in Complex Cases*, *Lawyers Weekly USA*, June 19, 1995. ([return to text](#))

[9] In October, 1995, Los Angeles County's Superior Court began accepting electronic filings, initially only in its probate division, but eventually in all civil matters. See Arleen Jacobius, *Two More Courts Add Electronic Filing: Prince George's, Los Angeles Counties Test Systems Designed for Many Cases*, ABA Journal, September, 1995, p. 20. ([return to text](#))

[10] Asay makes the point that the greater security benefit will be realized to the extent that privacy-enhanced mail and automatic reporting are used. ([return to text](#))

[11] Case management systems are discussed separately above. ([return to text](#))

[12] I will discuss data storage more in depth below. ([return to text](#))

[13] McMillan, *Trial*, Oct. 1995, pg. 23. ([return to text](#))

[14] Alan Asay, *Electronic Filing of Case File Documents*, Article prepared for Fourth National Court Technology Conference, National Center for State Courts, October 1994. ([return to text](#))

[15] I will discuss case-management systems in more detail below. ([return to text](#))

[16] McMillan, *supra*, note ?, at 21. ([return to text](#))

[17] Wendy R. Leibowitz, *Court Files At Your Desktop: Remote Access Raises Security and Privacy Issues*, *The American Lawyer*, March 1995, p. 21. ([return to text](#))

[18] The following example is taken from David P. Dandagriff, *Hanging Ten on the Internet: The Computer Network Grid Gives Lawyers Answers Quickly and Cheaply*, ABA Journal, February, 1995. ([return to text](#))

[19] Daniel B. Kennedy, *E-Mail Expansion: Nearly Every Attorney To Get Address*,

ABA Journal, June 1995. ([return to text](#))

[20] G. Burgess Allison, Technology Update, Law Practice Management, September 1995, pg. 12. ([return to text](#))

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[22] The following is a summary of Joint Project of the Institute for Court Management and American Bar Association Action Commission to Reduce Court Costs and Delay, *Evaluation of Telephone Conferencing in Civil and Criminal Court Cases* (Dec 1983). ([return to text](#))

[23] The following is a summary of William A. Fenwick & Robert R. Sachs, *Catching Up With the Present: A Proposal For Document Delivery in the Legal Profession*, 22 Golden Gate U. L. Rev. 313 (1992). ([return to text](#))

[24] The following is a summary of David A. Sokasits, *The Long Arm of the Fax: Service of Process Using Fax Machines*, 16 Rutgers Comp. & Tech. L. J. 531 (1990). ([return to text](#))

[25] 339 U.S. 306 (1950). ([return to text](#))

[26] Information regarding video-text integration is taken substantially from Nancy L. Eaton, *Video-Text Integration: The Future of Court Technology*, Massachusetts Lawyers Weekly, May 22, 1995, pg. S4. ([return to text](#))

[27] The following description of Rule-Based Expert Systems is taken substantially from Donald H. Burman, *Artificial Intelligence and the Law: Its Place in the Courts*, Fourth National Court Technology Conference, National Center for State Courts, October 1994. ([return to text](#))

[28] Information on jury computers and its advantages is taken substantially from J. Michael Rediker, *Courts in the 21st Century: Computer Technology Helps Win Cases*, Trial, October 1995, pg. 26. ([return to text](#))

[29] Computer animation has its own particular benefits: primarily, it enables attorneys to break down complex theories or concepts in linear pictorial form. In other words, computer animation is a marvel at rendering the complex simple. ([return to text](#))