

The Case for the Technology-laden Courtroom

by Bret Rawson

Executive Summary

Abandoned are the arguments of yesterday, for the purveyance of technology that would decrease the workweek from 40 to 20 hours. Americans still want technology, but for different reasons than those postulated twenty-five years ago. Everyone agrees that it is quicker to send an email than to mail a letter, and looking in a dictionary for the correct spelling of a word is beginning to seem as anachronistic as positioning a diamond needle on a round piece of grooved vinyl to produce sound. A "jump drive" the size of a lipstick container can hold thousands of documents, hundreds of audio files, and perhaps dozens of video files - and may hang inconspicuously from a key-chain. Video-teleconferencing systems provide users immediate access to individuals and organizations globally, diminishing the need for transcontinental or international flight. Digital audio and video technology is quickly becoming the standard for multi-sensory presentations in the corporate boardroom, and most recently, in the American courtroom.

If a general insistence on better and higher technology, and an increase in budgets to procure the same, is evidence of increased reliance on and perceived efficiency of such systems, then data acquired from a recent Federal Judiciary Center (FJC) survey indicate that judges and court staff desire better efficiency. This data, combined with a qualitative description of interviews conducted of court staff members and industry executives, as well as a survey of the equipment lists and photographs sent to *Courtroom 21* by a number of registrants of William & Mary Law School's Courtroom Information Project (www.courtroominformationproject.org), suggest that the multi-decade trend towards the integration of high technology, culminating in telecommunications networks, audio/visual systems and electronic evidence apparatus is coming to fruition. This high technology provides court participants the ability to do more in less time, the ability to present information and communicate with more impact, and the ability to control sophisticated courtroom management systems and telecommunications networks with the ease of a modern, windows-based interface. Where efficiency is the benefit, the liability may be contained in the communications theorists' adage, "the medium is the message." In a business where the message is oftentimes a matter of life or death for capital crimes, or billions of dollars awarded or not to plaintiffs in civil actions, understanding how or if the message is altered by the medium is a critical question for further study.

White Paper Scope

This white paper reviews the scope of use of courtroom technology and includes anecdotes from users and builders of technology-enabled courtrooms. Primarily, discussion of technology is limited to integrated courtroom control systems, audio/visual evidence presentation equipment and software, as well as telecommunications and videoconferencing networks. It describes the high tech courtroom, and draws inferences about the perceived increase in efficiency of such courtrooms from an important survey conducted by the FJC, as well as interviews of key industry participants. Advantages, disadvantages, problems, feasibility, and general usefulness of these integrated systems are also discussed.

The Technology

Integrated, technology-enabled courtrooms provide court participants including jurors, judges, litigators, witnesses, court reporters, clerks, court administrators as well as the public and media, access to information and communications systems that previously were only available in the most sophisticated corporate settings. As showcased in the College of William and Mary Law School's *Courtroom 21 Project*, advanced telecommunications systems enable court proceedings to span continents by linking, through audio/visual networks, court participants including all of the above, while providing the public a seamless ability to look-on via streaming Internet technology. Though courts throughout the United States vary in the scope of their technological capabilities, there appears to be a universal movement towards the more sophisticated.

The "electronic-architecture" of many of the most sophisticated courts are characterized by technology solutions enabling attorneys, juries, and judges the ability to electronic information. Evidence presentation has taken the shape of images on flat screen monitors viewable by everyone in the courtroom, or personal desktop or laptop terminals at jury stations and counsel tables. Subject matter and content, provided by litigators, and opened as files or projected through document cameras, are displayed in even microscopic detail to jurors and jurists alike. Digital audio and video display technology enables every persuasive element of fact or law chosen by advocates for the plaintiff or defendant - or the State or the accused - to be recounted in graphic detail in the likeness of an entertainment-center or home-theater . Counsel supplies visual information through courtroom video distribution systems. The courtroom may also have a local area computer network - wired, wireless, or both. Increasingly counsel are using wireless connectivity to communicate from the courtroom to the office or elsewhere.

The aim, to facilitate the trial process, is further bolstered by technology staff trained to control the technology at the direction of the judge or panel. In this manner, information, in the form of sound, still or moving images, or even text can be presented, or not, at the discretion of those officiating the court proceeding.

It is prudent to describe the components of the ideal technology-enabled courtroom before discussing the frequency of higher technology found in a more typical courtroom evidenced by the FJC data and interviews conducted of court staff and commercial entities within the high tech courtroom industry. Though the design of a high tech courtroom, or installation of devices when upgrading courtroom technology may vary according to the imagination of any particular judge or court administrator, certain types of devices and systems are commonly found in the best-functioning courtrooms. In addition to surveying the inventory of available equipment in the world's most technologically advanced courtroom - William & Mary Law School's McGlothlin Courtroom - further confirmation of the most desired devices, systems, infrastructure requirements and architectural considerations have been delineated through an interview with Kevin Sandler, President and CEO of ExhibitOne Corporation of Chandler, Arizona:

Infrastructure

There are many variables that must be addressed when designing the high tech courtroom. With the inception of modern computer networking came the problem of how to link those computers. Cables (CAT5 Network cabling) combined with standard copper cabling provides the typical scenario, although as pioneered by the Courtroom 21 Project's McGlothlin Courtroom, fiber optic cabling is now possible. Wireless routers with receivers and PCMCIA cards provide another option. However, with wireless networks security becomes a primary concern. Most courts opt for wires, and for those courts that were built before electronic interfacing and network systems were even an issue. Therefore the problem of where to put the wires is a real one. Additionally, the logistical issue of where to house server and routing hardware, as well as where to connect permanent terminals and laptops brought in by counsel and expert witnesses becomes a growing concern. Multiple technologies may be at issue, including the various audio/visual tools, each needing a connection point, requiring a number of cables and connections. With the rapid upgrade of hardware, connection devices and even cabling, the raised-floor system, as showcased in *Courtroom 21* , provides a novel approach. With this solution, cabling and access points for a number of hardware equipment options can be altered as needed. This avoids the problem of erecting a fixed solution that may become costly when an upgrade becomes necessary.

Courtroom Display

High-resolution plasma screens and personal flat screen monitors for jurors, judges and counsel mark the modern courtroom design. When it becomes necessary to pipe in testimony from a remote participant this may be best accomplished by a flat screen mounted in the area of an existing witness stand, providing the illusion of spatial continuity in the courtroom proceeding. A number of television screens and monitors, of various sizes are mounted in *Courtroom 21* 's McGlothlin Courtroom, and presentations of evidence or other audio/visual display is within line-of-sight of every courtroom participant including the visiting public.

Audio Systems

Good sound is critical in the professional presentation. Courtroom design must take into consideration the materials used in courtroom construction relative to the effect of echoing, sound quality and consistency of sound throughout the area. Speakers mounted throughout the courtroom may carry the voices of witnesses piped in from remote locations via videoconferencing systems. Witnesses and even litigators may speak different languages, and computerized translation systems may need to be installed. Also, audio recording and voice recognition devices may be important in some instances, especially those running parallel to the court reporter's system.

Command and Control

The term "command and control," though typically reserved for the military, is useful here to describe the centralized ability for fully integrated systems to operate through a single terminal where the volume of sound, display of images, and choice of video output can be controlled by either the presiding judge or a technical staff member. Though some courtrooms have specially trained staff members to run the more technologically complex systems, especially with reference to those integrated systems that require switching between multiple audio/visual devices, judges typically will want to maintain ultimate control. This is because, in a conventional sense, judges must discern the evidentiary value of information that counsel may wish to show jurors. In any event, "hub"-type systems can be designed to be operated by a technician, while at least reserving the ability for the judge to shut down video and audio output in the case of an objection to evidence presented or when the judge deems the information presented in electronic format to be beyond the scope of that allowed by the court rules, rules of evidence, or civil procedure.

Videoconferencing

An ideal videoconferencing system would support multiple remote sites simultaneously linked into the courtroom, and other adjacent rooms if required (including judge's chambers, holding cells, jury conference rooms, press galleries, etc.). If summoned to court, it used to be that witnesses' physical presence was required. This may no longer be so for courts that allow remote participation through any number of videoconferencing systems which are available on the market. Similar systems have been available for years and used extensively in corporate settings, to connect businesspeople from one corner of the world with another, to conduct business that would ordinarily have required face-to-face contact. This face-to-face requirement is central to a judicial system that allows the accused to face their accusers, and in an increasingly global environment, the efficiency of piping in real-time video images and sound is unquestionable. Because of the importance of being able to face accusers, or at the very least to have pertinent information accurately communicated, it is important to have experts in integration and courtroom architecture install such equipment.

An added advantage is the ability to use videoconference equipment to cross-examine prisoners who may be witnesses. The McGlothlin Courtroom (*Courtroom 21*) at the College of William Law School has been installed with closed-circuit television cameras aimed at a functional holding cell, with the ability to videoconference directly back to the cell from within the courtroom. This may be appropriate in those instances where direct physical proximity between a crime victim and the accused, or especially where the victim or witness is a juvenile, may be inflammatory. The alternative of videoconference equipment would keep the requirement to bring the accuser face-to-face with the accused, but would still provide the element of safety within the courtroom so that the truth can emerge and that justice can be furthered without the added psychological trauma sometimes inherent to criminal cases of sexual assault, and domestic violence. The Constitutionality of using remote prosecution testimony in criminal cases is unsettled; however, remote testimony is increasingly accepted in civil cases.

Additionally, expert witnesses and special masters (Federal Rule of Civil Procedure 53) are oftentimes burdened by the travel requirements associated with their participation in court proceedings. Where experts and masters have a requirement to speak in court, the videoconferencing alternative saves time and money in travel expenses, and enables these participants to potentially participate in a far greater number of proceedings.

Recording the Proceeding

Despite the advent of technological systems that streamline the process of converting the spoken work into text, the

skilled court reporter remains a critical staff member of the high tech courtroom management team. Though some of the most cutting edge record-producing alternatives involve voice recognition, the voice is typically that of the court reporter who must calibrate the device to his or her own voice. Digital audio and video recording systems may also be employed, but ultimately it is the court reporter who remains responsible for ensuring that the most accurate representation of the actual court proceeding is converted into text. This text, whether created through voice recognition, or more traditional stenographic equipment, is easily converted into a format for importation into any number of word processing applications. With some of the newer technology, this conversion is instantaneous. Additionally, because of this near real-time capability, courtroom participants with impaired hearing can now read along on monitors and plasma screens as the court reporter transcribes the text in real-time. Streaming data uploaded to the Internet extends the courtroom experience to a public that may consist of millions of people, depending on the interest level. By cataloguing the transcribed text into a database, sophisticated data-mining or database management systems can be used to query a database to produce any element of the recorded transcription.

Evidence Presentation

Before evidence can be presented to a jury, it must be deemed admissible by the judge. A judge will generally review a memo or brief depicting the nature of the evidence to be presented, prior to that evidence making an appearance in open court. If the evidence is in an electronic format, the judges' chambers should be wired to be able to review the information in its various formats. A computer, either desktop or laptop, should be able to display data in a text format, through various word-processing applications, as well as play back an audio or video file using a number of applications - oftentimes those which are usually bundled with the other software applications that come standard with the computer.

Hard copies of textual documents, and physical evidence in the form of any number of items or photographs of items would be reviewed for their probative value versus the likelihood that they will cause prejudice if shown to a jury. Though a judge will likely be able to see this evidence up close, or at least read a description of it, a jury will be shown the evidence in court. Document cameras, which is a video camera mounted vertically so that documents and small items can be placed underneath and projected through a monitor or large screen, can be used to easily show evidence that may otherwise be difficult to see. These cameras generally provide the user the ability to zoom in on particular aspects of the evidence. Pictures of evidence, perhaps stored as electronic files on counsels' computers may be retrieved and shown through monitors and screens mounted throughout the courtroom, including those mounted in front of each individual juror, the judge, and opposing counsel. Also video tapes, audio tapes and DVDs can be played using VCRs, DVD players and tape recorders, and each of these devices can be linked to the "control center" that is operated by a trained technician. In the event of an objection to the presentation of certain evidence, the judge's bench may be fitted with a "kill switch" to shut off anything displayed electronically until a decision is made on whether to proceed with a presentation.

Finally, making hard copies of digital evidence presented by counsel, or even electronic testimony emerging from a witnesses' utilization of a touch screen plasma monitor, or electronic whiteboard will require a network connection to a printer located within the courtroom or an adjacent room. Obviously, each hardware device used requires a connection that leads to a control module and server operated by the courtroom technician. Various commercial evidence presentation systems are available for this purpose, such as *Trialview* (TM) by ExhibitOne, or the portable version called *TVX* (TM).

Media/Public Access

Courtrooms, by design, will permit only a certain number of onlookers from the general public to be physically present in the gallery. The most high profile trials usually bring a circus of paparazzi eagerly waiting for news of motions, testimony and verdicts. Whereas historically the biggest decision a judge had to make was whether or not to let cameras, sketch artists and reporters into the courtroom, the advent of electronic and digital evidence and testimony has brought about a number of logistical and policy issues.

Inherent to the traditional system of filing public documents, especially in, for example, bankruptcy cases, was the ominous and burdensome process a citizen would have to endure to access public information about specific individuals. Now e-filing is easy, but public access gives rise to serious privacy concerns. With database technology, Internet access and audio/visual technology, the process of obtaining or retrieving information has been vastly simplified. Therefore cutting-edge technology is literally forcing jurists to consider policy issues that never existed before. For example, if a wireless system is used to connect the myriad electronic devices of evidence presentation and court record transcription, what will prevent interested third parties from capturing the signal and gaining immediate access to information that may be closed to the public and the media, at least for some duration? As court proceedings become more electronic, the preservation of information through firewalls and encryption will become a heightened necessity.

Architecture and Furniture

When designing the high tech courtroom, it is imperative that "line of sight" consideration is given to the installation of any evidence presentation devices, with particular attention given to the perspective of the jury, counsel, witnesses, and the judge. As mentioned previously, the choice of construction materials will affect sound quality, and microphones and speakers will have to be placed in the most appropriate places to pick up and distribute sound effectively. Furniture and cabinetry, which will house the various devices, must be built to accommodate them, as well as the connection devices and cabling that will be required to link them together. Raised floors may provide easy access to cabling, and in any case attention should be given to the anticipation of upgrades that will invariably occur in the future. Ultimately, it is prudent to hire a specialized consultant who has experience in the architecture of such courtrooms.

Heightened Efficiency in the Technology-laden Courtroom

In a number of interviews with industry participants and experts, as well as from inferences based on data collected by the FJC, and a purely qualitative description of activity relative to the Courtroom Information Project of William & Mary Law School, the case for heightened efficiency in the technology-laden courtroom is made. Perhaps the biggest advocate of technology-augmented litigation, Fredric I. Lederer, who is the Chancellor Professor of Law & Director, Courtroom 21, William & Mary Law School, has advocated the use of technology in the courtroom since the inception of *Courtroom 21* in 1993. Professor Lederer had this to say about the efficiency of such high-tech courtrooms:

We take the concept of efficiency very seriously at Courtroom 21. In fact every year we conduct a 'lab trial' in the high tech McGlothlin Courtroom to exhibit new and existing technology and to educate people about the degree to which efficiency is enhanced by its use. We have held trials in which international terrorists have been prosecuted while court participants interacted simultaneously from remote locations around the globe. We've held a civil trial where a "virtual operating room" was created to place jurors at the perspective of healthcare practitioners to help these fact-finders discover if alleged negligent malpractice had taken place. Who can argue that utilizing these high tech alternatives make the courtroom less efficient? We can do things with technology that not only save time, but bring jurors and judges closer to the truth in a way that only science-fiction enthusiasts imagined two decades ago. If efficiency is getting closer to the truth, and saving time while doing it, then we are teaching courts to be more efficient.

Professor Lederer is the first to admit that further research is needed on the psycho-social impact of such technology on jurors. Communications theorists surmise that technology-mediated realities alter perceptions. In any case, however, the demand for technology in the courtroom appears to be growing.

Michigan's 62-B District Court

Efficiency is only partially about saving time. As defined by Webster's New World Dictionary, efficiency is that which "produc[es] the desired result with a minimum of effort, expense, or waste." According to Judge William G. Kelly of Kentwood, Michigan's 62-B District Court, "sometimes we find that the technology actually makes the proceeding a little longer." Upon elaborating, Judge Kelly explains that some of the technologies, such as certain database features which enable him to pull up a defendant's payment schedule and show him or her to which judgments previous

payments have been applied, may take a few minutes longer but produce desired results. "Our case management software and the various monitors we have mounted around the courtroom allow the defendant to view our record of tickets that he has paid," says Judge Kelly. Also, Michigan's 62-B District Court is equipped with technology that enhances the quality of communication, enabling Judge Kelly to present the "Advice of Rights" in four languages, namely: English, Spanish, Vietnamese, and Bosnian. Furthermore, a Language Line interpreter can participate over the teleconference system meaning that the language barrier is breached for the vast majority of courtroom participants. Though the integration of computer terminals, telephone and audio systems and the videoconference network save time and money, Judge Kelly insists that it is perhaps some of the features that slow things down slightly that make his courtroom special.

When I am rendering a sentence, I can display electronic forms on the monitors and have defendants follow along as I explain what each form says. Many of the people in my court are nervous, and even the most literate may not absorb everything that is going on because of their anxiety. By showing them the forms, line-by-line - displayed in front of them on the screen - I believe their awareness is increased about what they are about to sign. I can print a hardcopy of the form after we have discussed it, and they can sign it right there in the courtroom. It takes a little more time, but it is worth it. The court experience can be intimidating, and rightly so, but it is important that people understand what is going on around them, and our courtroom is designed to facilitate that.

Judge Kelly has also noticed that as younger attorneys enter his courtroom, the demand for technology is on the rise. Though the older attorneys still struggle with the newer technology, Judge Kelly believes that through additional training this will change. "Most counsel went to college and law school long enough ago that technology was not taught. We will be conducting training to help them," he stated. When lawyers argue a matter of law in his court it oftentimes becomes necessary to analyze the precise language of the cases cited. "We are connected to the Internet and can display a browser on our monitors during a court proceeding. If it becomes necessary, say, to determine if a statute or some case uses the word 'shall' instead of 'may' for example, we can log onto Lexis Nexis and read the case right in court." Again, this may take a little time - but the desired result is justice. In that sense, Justice Kelly believes his court is more efficient with the technology and he is glad it was built to include it. "We installed the technology during the construction phase of the new courtroom," he continued, "doing it that way allowed us to include technologies that we never would have had the budget for if we had added it later. The 62-B District Courtroom was built in August 2002. When asked how he thought to construct such an impressive courtroom, Judge Kelly attributed it to a visit he paid to the McGlothlin Courtroom in 1994. "When I saw *Courtroom 21*, I knew it was the courtroom of the twenty-first century. This is where the future is, and when we saw it - we knew what we had to do."

Superior Court, County of Ventura

In a major renovation of their courtrooms in 2001, the Superior Court in Ventura County, California, upgraded nineteen courtrooms including both the county's Hall of Justice as well as a branch office - the East County Courthouse. This renovation focused on evidence presentation, and involved upgrading 19 courtrooms with monitors, sub-floor embedded cabling and multiple access connections. Additionally, because it was important to the court to maintain some flexibility in the utility of some of the equipment and systems the court procured, it opted for a hybrid version of ExhibitOne's TrialView(TM) system which is housed in six separate carts that the Superior Court strategically places on separate floors for maximum efficiency. According to ExhibitOne President and CEO, Kevin Sandler, mobility was a major objective in the renovation:

When we began discussing the possibilities with Ventura County, we knew our TrialView(TM) product would exceed their expectations, but only after some modifications implemented after careful planning with our client. Ultimately what they were looking for was the ability to keep a large portion of their evidence presentation capability portable in order to maximize efficiency throughout their facilities. They wanted more flexibility that a system which incorporates fewer fixed elements could give them, and we rolled out a solution which we are very proud of. As integrators, it is within the scope of our mission to adjust according to every clients' needs. Everybody's concept of efficiency is different based upon the objectives they are trying to fulfill - so we help them by taking our branded solutions, which, although they have the appearance of off-the-shelf solutions - really can be modified to meet the very specific requirements of any court.

The primary objective of the court, according to Ventura County Court Facilities Manager, Bruce Doenges, centered on a concern that the additional capabilities would require more time and effort due to the complexity of utilizing such high tech systems. The solution ultimately was a low tech one - wheels:

The goal we had was to come up with something that would minimize the amount of time and energy to be expended during setup, minimize any potential hazards, and maximize the availability of the technology. Consequently, we paid to have the respective monitors installed with all cabling buried. At key locations we had appropriate jacks and power installed. That way, anyone could push in the two carts, plug them in, and go. Additionally, it was understood with the Bar Association that attorneys who want to use this equipment had to be trained and the training was the responsibility of the Bar or respective departments, e.g., District Attorney and Public Defender. Again, we did not want to be spending limited court resources on this program. The net result was a good fit of fixed plus portable components in a single system.

As implied by Mr. Doenges, education and training goes hand-in-hand with a technological upgrade - to the extent that, in the case of the legal system, it is oftentimes a requirement of state bar associations that trial attorneys be trained on the specific technology installed in the courts. Technology integrators like ExhibitOne help to facilitate such training on technology that they integrate. The *Courtroom 21 Project* has recently developed a seminar of education workshops aimed at helping judges and counsel become proficient in the technology-enabled courtroom. Courses such as *Courtroom Technology: A Survey Course for Litigators*, *Persuasive Courtroom Presentation Technology*, *Electronic Discovery and Evidence*, *Deposition of the Technology Forensic Witness*, and *Electronic Discovery of Email: A Course for Litigators & Investigators* are examples of instructional courses designed to train court participants on concepts relating to the increased frequency of technology in court proceedings.

The Courtroom Information Project and the FJC Data

Begun in 2001 to "inform and educate members of the legal profession on the appearances and capabilities of our nation's courtrooms," the Courtroom Information Project (CIP) was started as a website-based program designed by *Courtroom 21 Project* staff to showcase the technological capabilities of the Nation's state and federal courts. Courts are solicited to register online a www.courtroominformationproject.org and upload pictures of their courtrooms from various perspectives, showing any technology that may be in plain sight. Courts also submit a list of capabilities, including particular evidence presentation systems and devices, and input access points for counsel laptops. This enables litigators who may not have seen the inside of particular courtrooms, to query an online database to find their court of interest, and determine what technology may be available. Also, because of the pictures, litigators can also get a feel for the general layout of the court - information that may prove critical in the development of presentations for the finder of fact.

To date, more than 200 state courts and nearly 100 federal courts have registered in the program, and the number grows daily. Upon review of the common technologies showcased by the many courts, a theme seems to have emerged. Many of the courts have older technology such as televisions, VCR's and perhaps DVD players, typically permanently installed in fixed locations, or occasionally on roll-out carts. Document cameras are common, as well as the older projectors, but increasingly more sophisticated integrated systems are emerging. Janel Foss, Assistant Director for Marketing and Project Administration, who is the *Courtroom 21 Project* staff member assigned with managing the CIP, has noticed an increase in the complexity of certain systems among several of the courts in the CIP. "I recently wrote a newsletter about the court in Maricopa County, Arizona. They registered their court with CIP and as I was processing their registration it became clear to me that the court was special," said Ms. Foss. The Maricopa County Courtroom boasts a VCR, document camera, overhead projector, podium laptop projector, counsel laptop projector, touch screen annotation, large screen monitor, attorney and judge monitors, real-time transcription and digital audio. Other courts, such as the Orange County Courthouse in the 9th Judicial District of Florida, and the US District Court in Medford, Oregon have similar technological capabilities. "Courts with more of these sophisticated equipment lists, and some with more of the complex, centralized command centers are popping up in the CIP database," Ms. Foss explained. "As courts are renovated and upgraded we find that they are more interested in registering with our program, because they are excited to show others what they have done," she continued. Ms. Foss believes that many courts are keenly aware of technology they would like to purchase, but have not yet found a

way to put the budget together. As Judge Kelly of Michigan's 62-B District Court had mentioned, this may be accomplished in the early design stage of a new courtroom, or a newly renovated one. That way, according to Judge Kelly, the construction cost may include the cost for new technology.

In May of 2002, the Federal Judiciary Center sent out a survey by email to all district courts asking about the use of technology in their courts. The information requested dealt with a broad range of topics ranging from systems designed to help people with particular impairments to the location of certain technologies, permanent installations versus mobile units that may be shared by multiple courtrooms, and the extent to which high technology is generally used in the courtroom. Of most interest to the purposes herein, are the results from those districts responding that they either have "permanently-installed or shared access to technology." The chart on the following page has been borrowed from the FJC study. Inferences about the meaning of the data are most appropriately characterized by the FJC, but it is included here by permission as evidence of the frequency of use of high technology in the courtroom:

Table 1
 Responding Districts with Either Permanently-Installed or
 Shared Access to Technology
 (FJC 2002 Survey)

Technology	Number of Responding Districts with Either Permanent Installations or Shared Access	Percentage of Responding Districts with Either Permanent Installations or Shared Access	Number of Responding Districts that did not Provide Information
1 Evidence Camera	84	94.4%	1
2 Wiring to Connect Laptops	82	93.2%	2
3 Laptop computers	28	32.6%	4
4 Desktop Computers	33	38.8%	5
5 Monitors built into jury box	49	56.9%	4
6 CRT Monitors outside the jury box	52	59.1%	2
7 Plasma Monitors outside the jury box	45	52.9%	5
8 Other types of Digital Monitors outside the jury box	26	30.9%	6
9 LCD/Digital monitor at the Bench	78	88.6%	2
10 LCD/Digital Monitor at Witness Stand	77	87.5%	2
11 LCD/Digital Monitor at Counsel Table or Lectern	77	87.5%	2
12 Digital Projector and Projection Screen	58	65.9%	2
13 Monitors or screens targeted at audience	65	77.3%	6
14 Color Video Printer	70	79.5%	2
15 Annotation Equipment	80	90.9%	2
16 Sound (Audio) Reinforcement System	81	95.3%	5
17 Noise Masking	72	85.7%	6

18	Signaling System	58	69.0%	6
19	Time Over Lights	25	30.1%	7
20	Telephone Interpreting System	47	53.4%	2
21	Infrared Interpreting System	75	87.2%	4
22	Kill Switch and Control System	79	91.9%	4
23	Scanner	17	20.0%	5
24	Electronic Whiteboard	36	41.4%	3
25	Integrated Lectern	70	81.4%	4
26	Audioconferencing Equipment	77	92.7%	7
27	Videoconferencing Equipment	75	85.2%	2
28	Control Room (Hub-based) Support for Videoconferencing*	26*	32.1%*	9*
29	Echo Cancellation System	43	51.2%	6
30	ISDN lines for Videoconferencing	71	81.6%	3
31	Real-time software for use by a real-time court reporter	70	80.5%	3
32	Real-time transcript viewer annotation system	64	74.4%	4
33	Digital Audio Recording	56	65.9%	5
34	Internet Connections for Lawyers	29	33.3%	3
35	Wireless Technology other than Wireless Microphones*	21*	26.6%*	11*
36	Analog Audiotape player	67	77.0%	3
37	Analog Videotape player	80	90.9%	2
38	Laser Disk Player	16	18.6%	4
39	Traditional Slide Projector	20	23.3%	4
40	Overhead Projector	58	65.9%	2
41	Television Set	71	81.6%	3

Table Notes:

- The first column of numbers indicates how many of the 90 districts that responded to the survey have some access to the technology--either via a permanent installation or mobile unit shared among courtrooms. The second column indicates the percentage of responding districts which have at least one courtroom with the indicated technology permanently installed or available for shared access. Percentages are based on those districts that provided information about the specific technology.

- Starred technologies indicate a high number of districts that did not provide related information, which makes it difficult to interpret the percentages.

Though it is unfair to suggest that this data correlates to a perception on the part of court administrators and participants that the return on investment from procurement of such technologies is measured in efficiency, there is no question that many courts are making the investment. The interviews and anecdotal information collected for this paper definitely indicate that some courts do believe that efficiency is bolstered, and are clearly satisfied with the results from the installation of equipment and systems, especially for evidence presentation. The twenty-first century, now more than four years underway, is certainly replete with examples of even the most conservative industries and organizations making an investment in technology. Though the legal industry has been said to be among the most conservative, any shift towards a greater use of technology by the courts will be noticed by lawyers and the firms and organizations that employ them. This fact, combined with technology training that is becoming more common in law schools, as well as through professional seminars and Continuing Legal Education, suggests that the technological horizon is getting closer. What effect this may have on the practice and study of law, as well as its impact on American jurisprudence, remains to be seen, and is recommended for scholarly inquiry.