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Courtroom Technology—

A Judicial Primer

By Fredric I. Lederer

Counsel: *In order to present our case, Your Honor, we would like to use a document camera, a couple of large monitors, and maybe a notebook computer. My technical expert says that it should only take a few hours to set up, and that we can duct-tape the wires onto the floor. May we proceed?*

Such a request is surprisingly frequent in courtrooms, as lawyers and judges increasingly adopt or urge the use of courtroom technology. Indeed, the nation is currently proceeding on parallel paths in the area. One path, the most common, is that of ad hoc technology use or installation. It consists of lawyers, judges, and court administrators who use or install one or more electronic aids on a technology-by-technology basis, often for a single case. The primary alternative is the integrated high technology courtroom, which is characterized by a substantial amount of technology that has been installed as a composite system, rather than as disparate pieces of equipment. Subject to definition, we estimate that there are now about one hundred high-tech courtrooms either already operational or well along in design or construction. The best

known of these courtrooms, and the one that supplies much of the information on which this article is based, is the McGlothlin Courtroom. The hub of the Courtroom 21 Project, a joint project of William & Mary Law School and the National Center for State Courts, the McGlothlin Courtroom is the world's most technologically-advanced trial and appellate courtroom.¹

Judges are increasingly being confronted with technological choices in the courtroom. At the same time, judges, always facing the press of work and the never-ending need to remain current, often find it difficult to obtain the basic information they need in order to rule on requests such as the one above. This article is written as a basic introduction to courtroom technology for the novice judge.²

Why Technology?

In our society and legal system, trials are formal proceedings designed to impress on all participants the seriousness of the system and the need for truth-telling. Via the adversary system we invite and test varying versions of events in the hope that, from the conflict of data and interpretation, we can

derive a useful truth. Anything that can better help counsel to present and the fact finder to understand the parties' information is of systemic importance. If, at the same time, we can speed up trials by one-quarter to one-third,³ as properly chosen and installed presentation technology does, we cannot afford to forgo such a critical opportunity. Remote two-way video-conferenced testimony can speed trials while diminishing the human difficulties inherent in obtaining in-court witness testimony. Language difficulties can be offset by technology-augmented interpretations, and instant access to electronic records, briefs, and legal authorities frequently permits immediate resolution of procedural and legal matters.

In short, technology can be an invaluable judicial tool. It does not, of course, substitute for the judge. Further, as anyone who has ever been told "I'm sorry, but the computer is down" knows, technology at its worst can be a major impediment. In our experience, properly installed courtroom technology is not likely to fail at an inopportune time, but technology that is not designed to coexist with the needs of the court's actual judges and

administrators can be problematic. Technology consists not only of hardware and software, but also infrastructure such as specialized millwork⁴ and cables. Courtroom solemnity is hard to maintain if participants are tripping on cables, even taped cables, and aesthetics are adversely affected by yards of duct tape. Counsel's opening duct-tape offer thus should be rejected, if possible.⁵

The Impact of Technology

The easiest way to understand the impact of courtroom technology is to appreciate its basic essence. Trial becomes an overwhelmingly visual and audio affair. Even the driest traditional component, legal argument, can become visual as the lawyer and judge exchange monitor images of legal authority. Opening statements and closing argument can become multimedia presentations. And, it all goes far more quickly than is possible in traditional practice.

Types of Technology

Courtroom technology can easily be divided into broad categories. We will use the following five divisions: electronic filing, pleadings, and legal authority; the court record; evidence presentation; witness technology; and remote appearances.

Electronic Filing, Pleadings, and Legal Authority. Currently, there are innumerable state and federal electronic filing experiments being conducted.⁶ Although some people doubt this, it is clear that most pleadings will soon be filed electronically from

lawyers' offices. As is already possible in a number of courts, the judge on the bench will be able to call up all the case information and pleadings. Further, the lawyers' briefs also will be electronic, complete with "hot-linked" (hypertext) legal authorities.⁷ During trial, the lawyer and judge will be able to exchange images of applicable legal authority.

In many courts, Westlaw and LEXIS/NEXIS are already available on the bench and sometimes from

Even legal argument can become visual as the lawyer and judge exchange monitor images of legal authority.

counsel tables. Access to the Internet makes available even greater amounts of information. Whether that information or access to it will prove useful in the usual case remains to be seen. That it can be both useful and determinative in specific cases is plain.

The Court Record. During trial, an available court record of the contemporaneous proceedings is at least useful; it is essential, of course, for appeal. From the perspective of the lawyer, it permits preparation of later witness examination, closing argument, and proposed jury instructions. The judge may find the record useful to ensure that the lawyer remains within the limits of fair comment and to prepare jury instructions. Although it is overly simplistic, we can say that our courts now use two basic approaches to make the record: the court reporter and electronic recordings. With few exceptions both approaches are technology-based.

Most stenographic court reporters use a steno machine to make a record of the proceeding. Today's electronic machines are really small computers that use a highly personalized software dictionary or database that is created

over time by the reporter. As the reporter types on the machine, the steno keypresses are compared with the dictionary. When a symbol/English match results, the steno machine translates the symbol into English. Later editing refines and corrects this rough draft text, greatly shortening the amount of time necessary to produce the final transcript. When the reporter connects the electronic output to a computer with appropriate software, judge and counsel can receive individual copies of the transcript that each can refer to or mark. This "real-time" feed can prove addictive for judges, and it also can be helpful to those who have a hearing disability, whether judge, lawyer, witness, or juror.

Voice-writing, better known as Stenomask reporting, permits the reporter to repeat every word said in the trial into a special hush mask. Traditionally, the repeated words are recorded on audio tape that is transcribed afterward. New technology permits voice recognition of the reporter's voice. This equipment must be trained to the individual speaker; no technology currently permits "open microphone" recording and automatic transcription, without human involvement.

Electronic recording includes audio and video recording. Traditional audio recording contains everything that is said in the courtroom, with subsequent human transcription, if necessary. Newer technology permits digital recording onto computer hard disk or other media of everything said in the courtroom. This technology also allows a contemporaneous CD-ROM recording that can be given or sold to counsel. Digital recording theoretically permits transmission via the Internet of the digital information for remote transcription. Video records are made in many courts as well, using multiple cameras within the courtroom. Often four camera images, a "quad-split," appear on the videotape record; each image appears in a picture-in-picture, showing one participant or part of the courtroom. Many such systems are voice-actuated, so that when someone speaks, either the speaker's picture-in-picture image is enlarged on the screen or the speaker



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appears full-screen. The most sophisticated systems permit more than four images.⁸

Electronic recording can be accomplished with or without the use of an electronic reporter. One advantage of using an electronic reporter, however, is that the reporter can supply a potentially critical check on the system by creating or monitoring a master log that makes it easier to find a given part of the recording.

All methods of making a court record can be highly accurate and useful. Each has unique strengths and weaknesses. Real-time reporting, with its immediate first draft transcript, can be extraordinarily helpful, but requires a highly competent court reporter. Electronic recording can be relatively inexpensive and easy but is dependent upon proper audio equipment and, when necessary, timely transcription. Contrast these methods to the McGlothlin Courtroom's ability to make a multimedia record that combines real-time transcription computer text with synchronized digital audio and video.

Evidence Presentation. The McGlothlin Courtroom's systems permit technology-augmented voir dire, openings, closings, and, potentially, jury instructions.

What we show. The simplest presentation technology is a document camera, which is a vertically mounted TV camera, aimed down at a flat surface. When a photo, document, or object is placed on the surface, the camera displays the image on the television(s) or monitor(s) to which it is attached. When this is connected to other equipment, the lawyer can write electronically on the video image, circling, underlining, or otherwise emphasizing the image in varied colors. Unless printed on an associated printer, however, the image disappears as soon as the equipment is turned off or the displayed item is changed.

Nearly all technologically augmented courtrooms have VCRs and, often, audio-cassette players. Videotaped depositions, computer animations, wiretaps, day-in-the-life tapes, and the like, all work well when played on tape. In some cases, the lawyers may wish to use laser disc players.

Although capable of high-quality pictures, this technology is likely to fade as computer-based DVD technology is developed further; CD-ROMs are already in use.

Whiteboards traditionally have been just that: white boards on which lawyers wrote with colored markers. A number of new high-tech variants permit lawyers' writing to appear as computer images in front of the trial participants, or to be preserved on a computer and later printed out in color. Still more sophisticated technology

The ultimate trial presentation tool is the computer.

permits lawyers to show video or computer images on forty-inch and larger screens, to write on or annotate them electronically, and even to control computers from them using finger movement. The newest technology now available in the McGlothlin Courtroom uses a fifty-inch diagonal plasma display that is about four inches deep and hangs on the wall like a painting.

The ultimate trial presentation tool is the computer. Most new technologically augmented courtrooms allow lawyers to connect a notebook computer to the courtroom's display systems. They can show evidence in the form of electronic images of scanned documents or photos; multimedia depositions that include audio-video and text; and, among other possibilities, three-dimensional photographs that can give the fact finder a complete-image "bubble," with the camera as the central rotation point. The lawyers can also use software to create colorful multimedia presentations to enhance opening statements and closing arguments. All of these systems use either easily available off-the-shelf presentation software or specialized evidence presentation software packages.

How we see it. In a minimum installation, a document camera is nor-

mally connected to one or more large televisions. A full courtroom installation with computer requires a far more sophisticated arrangement. Ordinarily, the judge, lawyers, and witnesses use computer monitors. The jury customarily uses either monitors, often one monitor per every two jurors, or the courtroom has a single very large display screen, often wall mounted. Choosing proper display means can be difficult. Even if cost were not a factor, as it always is, courtroom sight lines often complicate matters considerably, especially when eight-foot or larger diagonal screens are used. New courtroom designs should use flat-screen LCD monitors to minimize sight-line problems whenever individual monitors are desirable.

Who's in charge? It goes without saying that the judge must always be in control of all elements of a trial, including technology. Judges in technologically augmented courtrooms must have a monitor to see what counsel proposes to display and what is actually displayed. In addition, the judge on the bench ordinarily has either a desktop computer system or a notebook computer, or both, often with a real-time feed and a connection to the courthouse computer network. Control of physical courtroom technology is another matter.

Varying control options are possible. Although many judges prefer personal touch screen control systems on the bench that allow them to turn on and off the jury display, for example, other judges prefer to leave the lawyers with a degree of presentation control, having the deputy clerk act as courtroom technologist. In all cases, the judge should have the ability to blank out all display devices visible to witnesses and the jury in order to prevent inappropriate presentation conduct on the part of the lawyers.

The judge's control preferences may also dictate related albeit distinct decisions, for instance, who displays material, and from where. In Courtroom 21 designs, the lawyers use a central rotating Litigator's Podium that contains all necessary litigation technology. Like the National Advocacy Center in Columbia, South Carolina, many courtrooms have been

• For Your Information

Distance Learning for Judges

The following is a list of judicial education resources available online.

- **Judicial Education Center of New Mexico**

<http://jec.unm.edu/home.html>

- **The Federal Judicial Center**

www.fjc.gov/

- **JERITT** (The Judicial Education Reference, Information and Technical Transfer Project)

<http://jeritt.msu.edu/>

- **Texas Municipal Courts Education Center**

www.tmcec.com/

equipped with DOAR DEPS (Digital Evidence Presentation System), a complete factory-sealed electronic system that slides into a surrounding fixed podium. Both approaches maximize the ease and speed of the lawyer's presentation. A few judges, however, prefer to have counsel hand exhibits to the court deputy to display, or for the deputy to display, material via the deputy's own computer. Although inefficient, this maximizes judicial control of the process. Likewise, some courts require or permit the lawyer to appear from their tables.

Witness Technology. All evidence presentation systems involve the witness. The witness usually has a monitor on which to view evidence and, often, emphasize key points electronically. The emphasized material is displayed on the fact finder's screens. A few courtrooms have ceiling-mounted TV cameras so that the witness can write on any exhibit that is face down; Courtroom 21 uses a witness document camera for the same purpose. Following the Courtroom 21 example, courts may also wish to install plasma screen whiteboards immediately behind the witness stand, to give the witness the fullest opportunity to point to evidentiary detail, annotate diagrams or exhibits, or otherwise to testify. It is, however, the unique aspects of technologically supported testimony that should concern us.

On one level we must be concerned with the witness's ability to communicate. In addition to supplying sign language interpreters for witnesses with hearing disabilities, we may also use either full-screen or closed-captioned real-time transcription for the witness. Witnesses who cannot fully communicate in English can use remote electronic two-way foreign language interpreters.

Remote Appearances. We live in an age of ever-diminishing distance. Technology now permits relatively inexpensive, high-quality, two-way video communication,⁹ and our courts are adopting that technology at an increasing rate.

Hundreds of state courts have used remote first appearance and arraignment systems for criminal cases. We

are now turning to the use of this technology for remote witness, remote lawyer, and even remote judicial appearances.

Witnesses, primarily children¹⁰ and those who because of distance or circumstance cannot easily come to court, can now appear from nearly anywhere. That remote witness testimony is becoming institutionalized can be seen simply by noting Federal Rule of Civil Procedure 43(a), which expressly recognizes the procedure. The potential scope of remote testimony can be gauged by the seminal opinion, *Harrell v. State*.¹¹ In this case, the Florida Supreme Court sustained a criminal conviction in which the complainants testified by two-way video from Argentina. Meanwhile, courts such as the United States Court of Appeals for the Second Circuit regularly conduct remote lawyer appellate arguments; in two federal appeals heard in the McGlothlin Courtroom and in cases in the Tenth and District of Columbia Circuits, judges themselves have appeared via remote.

Remote appearances necessarily raise substantial questions of law and policy. Repeated experimental work conducted by and with the Courtroom 21 Project has shown that experts testifying remotely under oath and subject to cross-examination yield jury results identical to those in which the experts testify in court—so long as the expert appears life-sized in a monitor behind the witness stand. If these

results are replicated, and if *Harrell* proves persuasive, the critical question will be one of public policy. Would widespread use of remote appearances adversely or beneficially affect the public's perception of justice being done in our courts?

Is All This Legal?

Although first reactions often suggest that the more startling forms of technology, such as remote testimony, might pose new problems, close analysis usually suggests that we have no new problems, just old problems in new guises.¹² The electronic display of imaged evidence, for example, ordinarily presents nothing more than a modern application of the best evidence rule. The all-too-real risk of digital alteration of computer-based or -produced evidence is functionally similar to the evidentiary problems posed by the risk of sophisticated forgery of paper documents. Overly persuasive imagery raises unfair prejudice questions.

Ultimately, all technology uses reduce to traditional questions for judicial resolution. This need not continue, of course. The McGlothlin Courtroom, for example, will soon be able to host a virtual trial—a trial in which no two participants need be in the same physical space. That would indeed present new and substantial policy questions.

Conclusion

The technology genie is loose and cannot be returned to the magic lamp, there to rest undisturbed for years to come. For better or ill, technology is well on its way to becoming a commonplace and indeed essential element of courtroom design and practice. Just as judges must come to grips with discovery requests or search warrants seeking electronic data, the judiciary must now deal daily with electronic court data, court records, and presentation of evidence. It is largely the court administrators, of course, who bear the brunt of helping the courts choose courtroom and related technology and of ensuring proper design, installation, maintenance, and

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even perhaps lawyer training. Yet, just as all court questions are ultimately for the judge, here, too, all technology questions are ultimately for the court.

To provide the courts with assistance, the Courtroom 21 Project announced the Court Affiliates Program at the September 1999 Sixth Court Technology Conference (CTC6) conducted by the National Center for State Courts. The Court Affiliates Program will permit those courts with high technology courtrooms and those courts interested in eventually creating them to communicate, to help identify, discuss, and resolve critical, practical, and legal questions inherent in the use of technology.

What of the lawyer who opened our discussion with a request to use technology at trial? What should the novice judge do? The answer, of course, is not quite as simple as one would like. If the judge is fortunate enough to have a knowledgeable colleague or court administrator, a recess in order to obtain local expertise would be advisable. Absent that, it would be best to find out exactly what the lawyer plans to do, where the equipment is to be placed, whether the displays will be adequately visible to all parties, who will operate the equipment, whether the opposing party also plans technology use, whether adequate electrical outlets exist and exactly where those duct-taped cables are going to be.

In 1974, Chief Justice Burger observed that, "[h]ad Rip Van Winkle gone away and come back today . . . and if he went into the courts, the principal changes he would have observed would have been the wearing apparel, the increased number of judges and the air conditioning."¹³

This observation is rapidly ceasing to be true as our courts adopt technology. Rip Van Winkle would surely be amazed if he wandered into today's high-tech courtrooms and saw a witness testifying from overseas. We might ponder, then yet another observation, this one by Robert Kennedy:

"Just because we cannot see clearly the end of the road, that is no reason for not setting out on the essential journey. On the contrary, great change dominates the world, and unless we move with change we will become its victims."¹⁴

If there were a train of justice faced with a perhaps bewildering variety of different track ahead, our engineers would ensure to the degree possible that the route ahead was clear and straight. Our judges are the engineers on this unavoidable and indeed mostly desirable technological journey. *All aboard!*

Notes

1. The McGlothlin Courtroom welcomes visitors, either in person or via videoconferencing. Call 757/221-2228 to arrange a tour or presentation. The Courtroom 21 Project seeks to determine how to use appropriate technology to improve the administration of justice in the world's legal systems. See generally www.courtroom21.net.

2. For a much more thorough examination, including a discussion of many of the legal implications, see generally Fredric I. Lederer, *The Road to the Virtual Courtroom? A Consideration of Today's—and Tomorrow's—High-Technology Courtrooms*, 50 S.C. L. REV. 799 (1999) (reprinting an article made possible by State Justice Institute Grant Number SJI-98-N-136).

3. The anecdotal estimate of most trial judges using technology-augmented courtrooms. Because of strict time limits, appeals would not be so affected. Technology-augmented appeals, however, could be predominantly visual and far more "trial-like" than is now customary.

4. The critical reason for the August 1999 replacement/renovation of the McGlothlin Courtroom was the need to install special state-of-the-art courtroom millwork that could accommodate modern technology properly.

5. Unfortunately, it often isn't possible to avoid tape of one type or another. The best-designed high-tech courtrooms use removable raised floor sections that permit rapid and easy wiring and rewiring. Absent such a floor, if technology is to be used for a single case, taping the wires to the floor likely is unavoidable.

6. See generally James E. McMillan, *Managing Dockets and Caseload—The New Electronic Document World*, JUDGES' J., Winter 2000, at 19 (this issue).

7. This is becoming commonplace in a

number of appellate courts. In *United States v. Rockwood*, a case heard before the United States Court of Appeals for the Armed Forces in February 1999 in the McGlothlin Courtroom, amicus counsel submitted a CD-ROM that contained the briefs of all three parties, the statutes and cases cited by amicus counsel, and the entire imaged, 2,500-page trial transcript, all of which were linked to the amicus brief. During the April 1999 experimental Courtroom 21 Laboratory Trial, *Nolan v. Engines International*, counsel for both parties filed all pleadings, including a motion in limine and response, electronically via CD-ROM. The April 2000 Laboratory Trial will file via the new Justice-Link e-filing system.

8. Courtroom 21 uses a "5+1" system in which five small images and a large active image are displayed.

9. This ordinarily uses high-bandwidth communication lines such as ISDN lines. Each ISDN line is the equivalent of two telephone lines. Commercial-standard quality videoconferencing uses three ISDN lines.

10. See, e.g., *Maryland v. Craig*, 497 U.S. 836 (1990) (given case-specific finding of necessity, one-way video testimony by child victim didn't violate the Sixth Amendment).

11. 709 So. 2d 1364 (Fla. 1998).

12. See generally Fredric I. Lederer, *The New Courtroom: The Intersection of Evidence and Technology: Some Thoughts on the Evidentiary Aspects of Technologically Presented or Produced Evidence*, 28 SW. U. L. REV. 389 (1999). This is not to suggest that we ought not to modify our rules in order to ensure adequate advance notice of the use of such evidence or procedures, or to otherwise create additional procedural protections. See, e.g., MD. R. CIV. P. 2-504.3; James E. Carbine & Lynn McLain, *Proposed Model Rules Governing the Admissibility of Computer-Generated Evidence*, 15 COMPUTER & HIGH TECH. L.J. 1 (1999).

13. DAVID SHRAGER & ELIZABETH FROST (ED.), *THE QUOTABLE LAWYER* 38 (1986)

14. *Id.*

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