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The Road to the Virtual Courtroom? A Consideration of Today's -- and Tomorrow's -- High Technology Courtrooms

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THE ROAD TO THE VIRTUAL COURTROOM? A CONSIDERATION OF TODAY'S—AND TOMORROW'S—HIGH-TECHNOLOGY COURTROOMS*

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I. INTRODUCTION

We are living in a technological age that is increasingly dependent upon computers and related information technology. Although still scarcely more than fledgling steps, commerce is increasingly Internet-based.¹ Political discussions occur in cyberspace,² and matters of acute national interest such as Independent Counsel Starr's report, are released first via the Internet.³ Although prime-time media remains television-based, the major networks, most notably CNN, have significant web presences. Because the nation is sufficiently computer dependent, the Year 2000 bug has led some to predict the end of civilization will result from it.

At the same time, the legal system is changing. Most of the nation's lawyers, judges, legal administrators, and support personnel long ago adopted word processing, electronic legal research, time and billing programs, and, increasingly, varying forms of case management software. Electronic filing,

1. The Internet-based book seller, Amazon.com, may be the best example of a Web-based, full-service retail establishment of enormous inventory that is accessible to anyone with web access.

2. See, e.g., William Booth, *Politicians Set Their Sites on the Web; More Are Going Online to Woo Voters, Donors, Volunteers*, WASH. POST, Oct. 17, 1998, at A1. Among many other matters, Mr. Booth reported that "46 percent of likely voters have e-mail addresses." *Id.*

3. Congress's release of the Starr Report is the best example of Internet-based communication. "The California Secretary of State's election Web site had a mind-bending 1.8 million hits in one 24-hour period on the night of the June primary." *Id.*

already in use in a number of courts, is a topic of discussion in many jurisdictions. In Los Angeles and Indianapolis, for example, motorists can pay their traffic fines by connecting to Internet sites and providing credit card information.⁴ Also, some California offenders can go to traffic school on-line.⁵ There is even a virtual law firm.⁶

Yet, until recently, technology largely sidestepped the courtroom. Technology initially came in the form of ad hoc, case-specific hardware brought into the courtroom for use in a single case and later removed. Although ad hoc technology use is still common, and even frequent, the current trend is toward integrated, high-technology courtrooms. As of April 1998, the Courtroom 21 Project had verified eight qualifying state facilities and approximately thirty-two federal ones. More have come on line since then.

The advent of high-technology courtrooms and, in Australia, investigatory hearing rooms⁷ has raised the question of "virtual trials." If we assume, as we will later in this Article, that a "virtual trial" is a trial in which all the participants and all "information," (including the evidence, opening statements, closing arguments, and, in jury trials, instructions) are conveyed electronically in real-time, then a virtual trial and the virtual courtroom necessary to support it are still somewhere in the future. Yet if "virtual" means that significant portions of the evidence, including remote witness testimony, are conveyed electronically, then such trials and courtrooms are in fact already here.

The common characteristic of all high-technology courtrooms is the capability to present evidence electronically, which can be transmitted to anywhere in the world. Further, an increasing number of courtrooms include the capability for remote, two-way testimony via videoconferencing.⁸ Indeed, in April 1998 the Administrative Office of the United States Courts reported that at least thirty-four federal district courts, encompassing sixty separate

4. Jan Ackerman, *Courts, Lawyers Are Going High Tech*, PITT. POST-GAZETTE, Sept. 20, 1998, at B1.

5. See *The On-Line Traffic School* (visited Apr. 14, 1999) <<http://www.onlinetraffic.com>>.

6. A California organization, called the Virtual Law Firm, describes itself as "a bona fide law firm with legal talent collected from around the world. Our attorneys are either employed by the firm, are members of the firm, or [are] 'of counsel' to the firm." Comparing itself to traditional law firms, the Virtual Law Firm states:

We do not have a central attorney office; rather, we have a central office for administrative purposes only. The attorneys associated with the Virtual Law Firm are connected via electronic media. This allows us to tap into a talented pool of attorneys who prefer to work in a remote location or at home.

The Virtual Law Firm: What Is the Virtual Law Firm? (visited Apr. 14, 1999) <http://www.tvlf.com/tvlf/tvlf_html/vlf_what.html>.

7. The Royal Commission into the New South Wales Police Force hearing room in Sydney is the world's most technologically advanced legal investigatory facility.

8. Including remote first appearance or arraignment systems, the number of equipped courtrooms would probably be at least in the hundreds, if not the thousands.

locations, are or soon will be equipped for videoconferencing.⁹ At least twenty-nine states use or authorize videoconferencing for various proceedings,¹⁰ and a few have implemented remote, forensic-expert-laboratory testimony.¹¹ Even appellate courts are using videoconferencing; the United States Courts of Appeals for the Second, Tenth, and District of Columbia Circuits use videoconferencing for oral arguments,¹² and in *United States v. Salazar*¹³ the United States Court of Appeals for the Armed Forces heard a case in the Courtroom 21 Project's McGlothlin Courtroom with two of the court's five judges appearing via videoconferencing from different states.

Given that judges, counsel, and witnesses need not be in the same location,¹⁴ there is a real possibility of trials in which no physical commonality is present.¹⁵ With today's technology, we are unintentionally on the road to the capability for, if not the actuality of, virtual trials, virtual courtrooms, and virtual courthouses. Whether the result is a desirable destination, an unfortunate detour, or a one-way trip to disaster is far from clear. What is clear is that we are on our way.

This Article reviews the technology that is pointing us in the direction of virtual trials and courtrooms and then ponders the legal, human, and policy questions raised by that possibility. This Article is bolstered by the experience and views of several technologically pioneering jurists and court administrators, as well as the insights gathered by the Courtroom 21 Project staff over a six-year period. This Article also includes the tentative conclusions of the first Courtroom 21 International Working Conference on Technology Augmented Litigation. As has often been expressed in the Courtroom 21 Project, this Article assumes that technology should be only a means to an end and not an end unto itself. The question then is not what we can do with the technological options available to us, but rather for what purposes we may wish

9. Jerry Thacker, Remarks at the William & Mary Law School's Legal Technology Seminar (Apr. 1998). Mr. Thacker was the Assistant Director for Facilities at the Administrator Office of the United States Courts.

10. George Lange III & Lewis M. Smoley, *2d Circuit Is Now First Wired for Video-Argument*, NAT'L L.J., June 9, 1997, at B9. The states include Arizona, California, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, and Wisconsin.

11. David Green, Demonstration at the American Judges Association Annual Meeting (Sept. 1998).

12. *Videoconferencing Links Federal Courts and Public*, THE THIRD BRANCH (Admin. Off. of the U.S. Cts., Washington, D.C.), June 1998, at 6.

13. 44 M.J. 464 (C.A.A.F. 1996).

14. A telephone call from the office has been sufficient for attorney and party presence in some matters for the Fairfax County Circuit Court in Virginia, which is allowing attorneys to appear via conference calls in motion hearings and other matters. See Tom Jackman, *Court Lets Lawyers Make Some Appearances Via Phone*, WASH. POST, Jan. 7, 1999, at V1.

15. Although complicated, such a trial is possible. The Courtroom 21 Project believes that, if necessary and given adequate funding, it could accomplish such a case in a matter of weeks.

to use technology.

This Article addresses the current courtroom technologies that provide the foundation for virtual courtrooms, pauses to review the lessons of today's integrated, high-technology courtrooms, and then moves to a consideration of what may be tomorrow's virtual courtrooms.

II. FIRST, THE "PARADIGM"

High-technology courtrooms and technology-augmented litigation are reflections of the understood, but rarely voiced, nature of legal practice. Legal practice, especially litigation and adjudication, is a highly sophisticated form of information management.

The courtroom is a place of adjudication, but it is also an information hub. Outside information is assembled, sorted and brought into the courtroom for presentation. Once presented, various theories of interpretation are argued to the fact finder who then analyzes the data according to prescribed rules (determined by the judge through research, analysis and interpretation) and determines a verdict and result. That result, often with collateral consequences, is then transmitted throughout the legal system as necessary. The courtroom is thus the centre of a complex system of information exchange and management.¹⁶

Ultimately, because lawyers and judges deal continuously with "data," high-technology courtrooms exist and virtual courtrooms are possible.

III. THE FOUNDATION FOR THE VIRTUAL COURTROOM: TODAY'S DEVELOPING TECHNOLOGIES

A. Case Management, Electronic Filing, and Related Information

The courtroom does not exist in a vacuum. The cases that are tried in the courtroom begin with the filing of pleadings, often continue with motions and supporting documents, and only finally arrive in the courtroom complete with often copious evidence.

Modern case management requires systems that help courthouse personnel manage the flow of cases. Cases must be kept current and case information

16. Fredric I. Lederer, *The Courtroom As a Stop on the Information Superhighway*, REFORM, Spring 1997, at 4, 4.

must be routed to a variety of critical administrative personnel and judges.¹⁷ Managing the case effectively requires managing the information that gives rise to the case. In traditional terms, that requires storing and routing the originals and copies of what can be huge amounts of paper, especially in a major urban courthouse. If only to achieve the largest money and time economies possible, one can expect court administrators to seek more efficient control over paper by reducing it to electronic data. This gives rise to electronic filing.

In its most basic form, electronic filing, now being experimented with around the nation,¹⁸ either permits or requires attorneys to send pleadings electronically to the court. Pragmatically, a good system will also provide for the dispatch of copies to all other necessary parties.¹⁹ Although electronic mail permits simple communication of information, it is entirely inadequate from a systemic point of view. From the court's perspective, efficiency requires that the case name, parties, attorneys, and other data be supplied to the court in an identifiable manner that permits the court to capture that specific information for case management purposes. At the same time, current court rules require that the legal documents themselves be submitted in highly specific formats. Appellate rules, for example, may mandate fonts, type sizes, and page limits. Presumably almost all materials written by lawyers are produced using computers. Unfortunately, each software package is unique, and none of the available options can be converted perfectly into another's format. Accordingly, any electronic filing system must accommodate the differing formats. Even if this is done successfully, one must then cope with two critical complications: first, some documents that must be filed will not be produced using a computer and must therefore be converted into an electronic image; and second, *pro se* litigants cannot be expected to file by computer.

In reality the electronic filing situation is more complicated. Not all lawyers use computers, and a perfect electronic filing system must either require the largest degree of such filings possible by coercing the lawyers to participate electronically, or cope adequately with what could be a significant amount of paper. Once electronic information measures are implemented, the likely court solution is to take any paper that is traditionally filed and have the court turn it into electronic data. Members of the public without electronic access must then be assisted by court staff when they wish to take advantage

17. See generally *Technology Information Service: Case Management Systems* (visited Apr. 14, 1999) <<http://www.ncsc.dni.us/ncsc/tis/CASEMGMT/Casemgt1.htm>> (offering several links to court case management resources). At the same time, lawyers must manage their own cases and frequently will use both firm and individually based management software packages. In an ideal world, all of these different software products would interrelate and easily exchange information. However, we do not yet live in that world.

18. Wendy R. Leibowitz, *Courts Electrify Suits, Sparks Fly; New Rules Needed for E-Filings*, NAT'L L.J., Sept. 7, 1998, at B6.

19. The National Center for State Courts, in collaboration with the West Group, is producing a set of model rules for electronic publishing and filing. The work is expected to be published soon.

of their right to public access to the filed materials.

The collateral consequences of electronic case management, filing, and related systems are of great potential importance. Scheduling a hearing, for example, will require resort to one or more calendars. The judge's calendar will be critical, but if the judge is not assigned permanently to a given courtroom, a courthouse calendar will be required as well. At the same time, efficient scheduling should involve access to all other hearings involving the same counsel.²⁰ At the very least, these needs impel judicial access to more sources of scheduling information, and such access should be available from both the judges' chambers and the bench. When the implementation of electronic filing occurs, the actual pleading and associated legal documents, all in electronic format, augment calendaring information. Once this information is available and electronically accessible, there is little or no reason to limit it to court personnel. Trials are open to the public, and the status of filed cases, including scheduled public hearings, are matters of public and media interest. Further, the content of filings can be of enormous interest to other parties and to the public. This interest is especially true in litigation involving many parties such as the breast implant and tobacco cases. Once the basic information is available, absent special circumstances such as sealed filings, there is little reason not to make it generally available, and the World Wide Web has provided a simple mechanism for doing so.²¹ The immediate, world-wide electronic access to fundamental scheduling information, accompanied by the images of the actual documents, creates a virtual clerk's office and more. For example, Delaware's Chancery Court is going online. "By the end of the year, lawyers, judges and consumers should be able to dial up the business court's Internet Web site to get copies of lawsuits, briefs and settlement documents . . ." ²² Should the judge respond to pleadings with electronic court orders without in-person hearings, a virtual pretrial court session will exist as well.

The currently evolving virtual clerk's office clearly permits faster, more efficient, and cheaper operation of the office. Electronics almost entirely eliminate physical storage costs and nullify transmission and notification times. At the same time, public access becomes truly meaningful, largely for the first time. Unfortunately, these improvements come at some cost. Technology adoption and training expenses are significant, especially if the number of

20. Given the multitude of courts and jurisdictions, believing that any single lawyer may practice before a single unified calendar seems fanciful. Accordingly, counsel must avoid appearance conflicts. However, instant access to potential conflicts would likely be of service to all those concerned.

21. "[B]oth lawyers and members of the public involved in or simply interested in the status of over 40,000 silicon breast plant litigation cases in the United States can access case information via the World Wide Web at <<http://www.fjc.gov/BREIMLIT/mdl926.htm>>." Lederer, *supra* note 16, at 71.

22. Jef Feeley, *Delaware Moves to Put Court Online: Data Base to Provide Access to Key Corporate Filings*, NAT'L L.J., Sept. 21, 1998, at B1.

computer illiterate court and bar personnel is substantial. Once embarked on the technological roller coaster, the court will almost certainly find itself faced with questions of periodic upgrading of both software and hardware and the risk of having one or more of its systems "orphaned" as the cut-throat world of technology competition eliminates companies. Compatibility may be a major problem, not only among different systems—lawyers may have to deal with different filing systems for each court—but also within the court if later upgrades prove to be incompatible with prior versions of the software. Moreover, the impact on the public is far from trivial. Although those people who have access to computers, access to the Internet, and computer skills will have immediate access to what is taking place in their courts, those without such advantages will be dependant on the clerk's staff, which is, ironically, the present situation.²³ However, one other result will occur—a sharp change in the privacy of court documents and court information.

The general public has always had legal access to court records dealing with title to real property. Any interested person can check the status of any parcel of real estate, including associated liens. However, as a practical matter this right has been of little value. Even if people were aware that such records exist and are public, they do not know how to find specific records. Few would bother to ask for a clerk's assistance without special reason.

Electronic data has changed the situation, however. Some years ago Lexis began to carry these records as part of its database. Using this database, one could obtain a description of a friend's house on the other side of the United States, along with a property tax valuation, or even discover real estate owned by the friend of which you were unaware. Similarly, at least one newspaper reporter anonymously reported to me the ability to access court database information of allegations that members of the public had committed highly disagreeable offenses. Before electronic records were made, this information existed but was effectively impossible to search. Now, not only do lawyers not need to travel to the courthouse, but Internet searches can retrieve the data almost immediately without the need for specialized legal knowledge. Electronic court information thus makes real and important changes in the actual degree of privacy that exists in the court process, changes that diminish individual privacy. Easily accessible virtual trials would likely replicate this result.

Some years ago, Art Buchwald wrote a satirical column in which a fictional commuter-rail passenger refused to pay for a ticket because his train car was not heated and arrived late.²⁴ The conductor summoned the police and the commuter was forced to defend himself in court. The trial was televised. The trial was brief and the commuter was acquitted of disturbing the peace. Subsequently, the commuter found that a surprisingly large number of people

23. Of course, at present few people can navigate the court without significant help, and all need court staff to obtain most litigation documents.

24. Art Buchwald, *TV Trials and Errors*, WASH. POST, Feb. 10, 1981, at E1.

had viewed some or all of his case, but that few remembered the details. Instead, they all ascribed major criminal violations to him, eventually resulting in the loss of his job and an offer extended to him as an "ex-con." Although today's significantly increased media coverage of trials calls into question Buchwald's tongue-in-cheek view of the impact of television and the average citizen's perception and memory, his basic premise of a change in individual privacy seems sound. Like court records, most trials are effectively private; Court TV and the other television stations and networks have limited carrying capacity. Today's easy access to data suggests that virtual trials which could be followed at home via Web-television or computer might replicate the colonial period in which the general public had easy access to cases and regularly attended trials, if only for entertainment.

B. Legal Briefs and Other Legal Materials

Legal research is a critical component of any lawyer's practice, and it is increasingly unthinkable that American lawyers could function successfully without access to electronic legal materials. Lexis and Westlaw are mainstays for most lawyers. They have brought to attorneys vast and ever current libraries available originally through dial-up telephone connection and now via the Internet. Similar materials, albeit not as current, are available in CD-ROM publications. Firms such as Matthew Bender supply sophisticated electronic form books on disk that further automate legal practice.

Access to electronic legal materials has changed the nature of law practice. It has created virtual law libraries and, through on-line access, has hastened the advent of the virtual law office, one which exists wherever the lawyer may happen to be. Within the high-technology courtroom, counsel and judge have immediate electronic access to nearly all legal authorities. Further, and critically, when the courtroom is properly equipped, counsel and judge may display their authorities to each other as an important adjunct to legal argument.

Given the increasingly electronic nature of legal materials, there is no surprise that lawyers are now creating electronic, multimedia legal briefs. The famous Fish & Richardson *Yukiyo* appellate brief²⁵ was a multimedia CD-ROM brief that contained, on one disk, counsels' briefs, hypertext-linked legal authorities, transcript, and evidence. The brief also included all of the necessary documents one would expect in the Appendices, along with diagrams, video clips, and part of a video deposition with audio. Although the United States Court of Appeals for the Federal Circuit granted Watanabe's motion to strike the CD-ROM in favor of a traditional presentation,²⁶ the court laid out procedures for later high-technology briefs, which the court has

25. See *Yukiyo, Ltd. v. Watanabe*, 111 F.3d 883, 884-85 (Fed. Cir. 1997); see also Wendy R. Leibowitz, *When High-Tech Is Over the Top: Is a CD-ROM Brief Fair or Foul?*, NAT'L L.J., Mar. 3, 1997, at B8 (discussing the Fish & Richardson CD-ROM brief).

26. See *Yukiyo, Ltd.*, 111 F.3d at 886.

received.²⁷ Companies such as West, Lexis, and Pubnetics, among others, now produce or assist in the production of such briefs.

The advent of electronic legal briefs carries at least three significant implications. The first is that appellate practice may be changing. These briefs are far more comprehensive than their traditional equivalents and, if used in an appropriately wired courtroom, they permit extraordinary electronic visual interchange of legal authority among judges and counsel.²⁸ The second implication stems from economics. Electronic appellate briefs are in part compilations of materials generated at or presented during trial. To ensure the most inexpensive preparation possible, underlying trial matters, including transcript and evidence, should originate at trial as digital information so that the "data" can be reproduced quickly and cheaply in the brief. Lastly, these briefs can be filed, exchanged, and presented electronically, laying the groundwork for a virtual appellate courtroom.

C. Court Record

Courts of record in the United States require verbatim records of their proceedings. In general terms, courts can be divided between those which use stenographic or stenomask court reporters to generate the record and those which use some form of electronic voice recording. The record is of importance to both trial and appellate courts and to the attorneys and parties involved.²⁹ Recent developments in court record technology show how quickly

27. See, e.g., *Rodime PLC v. Seagate Tech. Inc.*, 45 U.S.P.Q.2d (BNA) 2023, 2024 (Fed. Cir. 1998) (unpublished opinion) (following the guidelines for CD-ROM briefs set forth in *Yukiyo*). The United States Court of Appeals for the Second Circuit is encouraging the submission of appellate briefs in CD-ROM form. See Joanna Glasner, *Second Circuit Unveils Latest Courtroom Tech*, N.Y. L.J., Nov. 10, 1997, at T4.

28. This electronic interchange is subject to time constraints. Some years ago while visiting the Courtroom 21 Project's McGlothlin Courtroom, Justice O'Connor suggested that this type of interchange might impel a shift towards the far more relaxed time rules customary in the British House of Lords.

29. During deliberation in the much-publicized trial of Louise Woodward, the *au pair* subsequently convicted for the death of a child in her care, the jury asked to review the testimony of a key defense witness. The judge refused because producing the transcript was a practical impossibility. The stenographers' record had not been transcribed and transcribing the portion requested would have taken too long and interrupted deliberations of a sequestered jury (the witness had testified for two days).

In responding to this issue in the defense motion for a new trial, the judge noted that not having contemporaneous transcripts was the norm for that court and that the attorney could have ordered daily transcripts at the start of the trial or presented the jurors "his own recollection" in closing argument. *Commonwealth v. Woodward*, 7 Mass. L. Rptr. 449, 450 (Super. Ct. 1997). This event opened the door to discussions of real-time transcription and contemporaneous records. It also spawned criticism of the court for not being technologically up-to-date, especially for such a complex, high-profile case. See Patricia Nealon, *Trial Spotlights Flaws in Court Transcript Technology*, BOSTON GLOBE, Nov. 5, 1997, at A19.

In contrast, real-time transcription was used in the equally well-publicized trial of Ruthann Aron, the United States Senate candidate who ultimately pleaded *nolo contendere* to

we are developing the infrastructure necessary for a virtual trial.

Most court reporters have been using modern technology for many years, generating computer-assisted transcription. The most capable of court reporters can generate a "real-time" transcript, a contemporaneous, substantially accurate rough draft of the transcript that is made available to judge and counsel on their personal computers. Until recently, only stenographic reporters could produce such a transcript. But in 1997 a Louisiana company, Audioscribe, produced the first trainable, speech recognition, real-time system that permits stenomask reporters to produce real-time transcript, albeit at a level not yet equal to better stenographic reporters. Real-time is inherently digital. A transcript results when the court reporter's keystrokes or voice finds a match in the computer's database; absent such a match, symbols that can later be translated are produced. Because the transcript is electronic, it can be transmitted over telephone lines or, as is increasingly done, can be published on the web for real-time viewing.

The alternative to court reporter-produced transcripts is electronic recording, including audio or audio and video. Although analog tape-recorded audio is the most inexpensive recording technology, more useful digital audio is now beginning to replace the older technology. Digital audio has significant improvements over analog, including easier storage and, often, text annotations that can be used as a limited search index.³⁰ Like real-time, the digital nature of the audio permits transmission to remote locations either via ISDN, or other heavy bandwidth connections, or via the World Wide Web. Video records, traditionally videotaped proceedings, have generated more comprehensive electronic records because they include picture and sound; indeed, electronic recording inherently supplies information to an appellate court that is not available through a traditional transcript alone.³¹ However, except for

the charge of contracting to kill her husband. Its impact on the trial was obvious. Judge Paul McGuckian, who received a contemporaneous transcript on his laptop computer as the trial progressed, noted that the real-time feed allowed him to gauge his perception of testimony. "Sometimes I'm not sure I understood what a witness said This allows me to confirm or disabuse myself of something." Candus Thomson, *Instant Transcripts Transform Trials; Technology Captures Courtroom Testimony in Blink of an Eye*, BALTIMORE SUN, Mar. 3, 1998, at 1B. The defense attorneys noted that though real-time transcription is expensive, it ultimately saved the defense time and money—time in note taking and preparation for cross-examination, and money in that expert witnesses were kept abreast of developments without being present in the courtroom. *Id.*

Setting aside the issue of who should be responsible for ensuring the cost and production of an adequate record, it is apparent that court record technology can have an impact on the substance of a trial and, perhaps, on the administration of justice.

30. However, as the audio cannot itself be searched, this provides only a small fraction of the capability that would be found in a court report's electronic transcript.

31. See Fredric I. Lederer, *Technology Comes to the Courtroom*, and . . . , 43 EMORY L.J. 1095, 1112 (1994).

By their nature, video records display the very matters ordinarily invisible to written transcripts: body movements, facial gestures, vocal intonations,

Kentucky, states have generally not accepted video records as direct court transcripts.³² Accordingly, when a party wishes to appeal, the video record must be transcribed, as is also the case with an analog or digital audio record.³³

The same technology used to make the court record is often used before trial for discovery purposes. Videotaped depositions have been used for many years in the courtroom either in lieu of in-court testimony or for impeachment of a witness. Combining digital audio and video with a computer-assisted transcript produces a synchronized, multimedia transcript. When such a deposition is played in court, ordinarily from a CD-ROM, counsel can present the audio, video, and scrolling-electronic-text transcript. When published on the World Wide Web, the same technology provides a comprehensive real-time record. This virtual "deposition attendance" is an important marker on the road

and the like. These movements may prove essential to understanding the impact of information not reflected on the written record. In one well-known case, the judge apparently expressed his disbelief at the alibi testimony of a witness by shaking his head and silently turning his chair away from the jury. Such extremes are not necessary to raise the question of silent judicial communication. "Every time the judge makes a movement—each time she knits her brow, yawns, rolls her eyes, scratches her head—it is at some level interpreted as a commentary on the testimony of the witness. That commentary becomes particularly intense because it is, in the main, subliminal."

Id. (citing *State v. Barron*, 465 S.W.2d 523, 527 (Mo. 1971) and quoting LaDoris H. Cordell & Florence O. Keller, *Pay No Attention to the Woman Behind the Bench: Musings of a Trial Court Judge*, 68 IND. L.J. 1199, 1206 (1993)).

32. KY. R. CIV. P. 98. Kentucky adopted widespread use of video records after it experienced difficulty with inadequate court reporter coverage, untimely transcripts, and excessive transcript charges. Harvard University Kennedy School of Government Case Program, *Court Reporting in Kentucky (A)* (C16-91-1035.0 1990).

33. See, e.g., Rorie Sherman, *Virtual Venues*, NAT'L L.J., Jan. 10, 1994, at 1, 30. In part because they were time-consuming and cumbersome, the United States Judicial Conference recommended not to use videotaped records alone. Courts have sometimes tried to choose between reporter and recorder based systems. In most circumstances this is a false dichotomy. No known recording system can yield a transcript as quickly and efficiently as can a competent court reporter using real-time transcription. However, ordinarily transcripts are needed for court purposes only for read-backs of testimony during trial, preparation of jury instruction (or verdict consideration in a bench trial), or preparation of an appellate transcript. In courts or cases in which there are few read-backs or appeals, electronic recording is a highly cost-effective solution. As most courts have a mixture of cases, however, they ought to have an administrative structure that permits skilled court record managers to decide on the most appropriate type of record to be made on a case specific basis. At the same time, it would be extraordinarily insular to fail to note that the lawyers and parties in cases have interests distinct from the courts. Lawyers often want rapid transcript delivery to prepare for witness examination, closing arguments, and jury instructions. Further, lawyers frequently need a usable transcript to decide whether to appeal. At the very least, this dictates the need for rapid and accurate transcription when electronic recording is used.

to the digital courtroom.

The same technology that permits multimedia depositions also can be used to create multimedia court records. Because digital video takes up a huge amount of electronic storage space, such a court record has not been commercially feasible—and the Courtroom 21 Project's McGlothlin Courtroom is believed to be the only courtroom in the world that has a functioning multimedia-court-record system that combines audio, video, and synchronized real-time transcript. Changing technology, however, should address this problem in the next few years.³⁴ At the same time, Internet and network technology is quickly changing our expectations of data access and availability. Working with an Australian company, the Courtroom 21 Project is in the process of completing a system that combines the reporter's real-time transcript with digital audio,³⁵ all evidence, and relevant case management and electronic filing data, thus providing an immediate, electronically disseminated record.

In the past the availability of a comprehensive court record that includes voice inflections and body language has raised questions of how the appellate system might be affected. Traditionally, the appellate courts give deference to the evaluation of demeanor evidence by the trial court.³⁶ A comprehensive multimedia record necessarily forces one to ask whether appeals might become, in effect, *de novo* appeals.³⁷ Although the sheer number of cases alone argues against this result, it can hardly be gainsaid that an appellate court likely would feel far freer in its review if it had available nearly everything that had happened below.³⁸ Although concern about the scope of appellate review is valid and perhaps even of increasing importance, an electronic record emphasizes our ability to take legal events that occur during trial and instantly record and transmit them. Accordingly, if all evidence can be given electronically, the core components of a virtual trial are present.

34. Due to their significant increase in storage capacity, second and third generation DVD-ROMs may be the breakthrough necessary to make this record financially feasible.

35. As removable electronic storage media increase in size, video will be added.

36. See, e.g., FED. R. CIV. P. 52; see also Junda Woo, *Videotapes Give Appeals Cases New Dimension*, WALL ST. J., Apr. 14, 1992, at B1 (discussing the need for judges to follow the traditional deference rule).

37. If nothing else, one must wonder how an appellate court would respond to a more complete rendition of the proceedings below. Given sound and video, one must assume that the court might be more engaged in appellate review. Yet what, if anything, would be lost compared to review of written transcript, and what would really be gained. "Conscientious and competent judges are best supported by accurate trial records. The more accurate the record, the less likely that the case will be reversed. Indeed, one study by the National Center for State Courts has determined that comprehensive video records increase appellate affirmances." Fredric I. Lederer, *Courtroom Technology from the Judge's Perspective*, CT. REV., Spring 1998, at 20 (citing JAMES A. MAHER, NATIONAL CENTER FOR STATE COURTS, DO VIDEO TRANSCRIPTS AFFECT THE SCOPE OF APPELLATE REVIEW? AN EVALUATION IN THE KENTUCKY COURT OF APPEALS (1990)).

38. Smell and touch cannot easily be recorded during trial. On the other hand, it is a rare appeal that might implicate those senses.

*D. Evidence and Information Presentation**1. In General*

Litigation is, of course, a dispute between parties. Resolution of the dispute requires that the parties, usually through counsel, prove necessary relevant facts and then persuade the fact finder—judge or jury—that when the applicable law is applied to the facts, a verdict in their favor should result. To prove the appropriate facts, counsel present evidence. Evidence normally consists of witness testimony and actions,³⁹ documents, charts, photographs or other images, and physical objects. When counsel make opening statements or closing arguments, they technically do not present evidence. Instead, they can be viewed as presenting information to the judge and jury. Information, like evidence, consists of verbal statements often supplemented by documents, charts, photographs or other images, and physical objects. Perhaps the core element that characterizes technology-augmented litigation and high-technology courtrooms is the use of technology to present evidence and counsel-originated information. The effect of electronically displayed evidence can be seen in recent Australian litigation:

Downtown at 55 King Street, two of Victoria's biggest ever civil trials are in full swing on adjoining floors of the Administrative Appeals Tribunal building, specially leased for the purpose by the Supreme Court.

Both cases are engaging in documentary warfare on an epic scale, but ride the lift from one floor to another and the picture is strikingly different.

On the first floor, the court is wading knee deep through the paper trail tracking the collapse of the Pyramid Building Society.

The courtroom is crowded with shelves overflowing with files—500 per party. Every time a document is mentioned, there's a mad scurry as everyone rifles through shelves and leafs through pages looking for the right piece of paper.

Downstairs, where investors in the failed Estate Mortgage are trying to win back some of the \$1 billion lost by the company during the eighties, the atmosphere is strangely serene for a court ploughing its way through more than 30,000 documents (pared down from the original 1.5 million).

The room is dominated by computers, rows and rows of them. The smattering of files barely takes up a single shelf.

39. To this might be added demeanor evidence—how the fact finder perceives a witness while testifying.

The only sound punctuating the drone of the presenter is the occasional click of a mouse button.⁴⁰

Courtrooms can install technology either temporarily for a specific trial or permanently in an integrated, high-technology courtroom. Most technology-augmented evidence and information presentations originate with document cameras, computers, and computer white boards.⁴¹ Large television screens, jury monitors, front or rear projection screens, or any combination of these can display evidence and information.

Although the distinction is an uneasy one, as will be seen, we sometimes can legitimately separate the electronic display of evidence and information from questions surrounding the use of electronic evidence per se.

The most commonplace, and simple, way of presenting material in court via technology is to use a document camera. Often known under the name of the two most common vendors, Elmo and DOAR (Communicator), a document camera is simply a vertically mounted TV camera aimed down at a flat surface. The lawyer puts a photo, document, or object on the surface, and the camera instantly displays the image on the television(s) or monitor(s) to which it is attached. The camera has two buttons permitting easy and fast closeups. . . .

A document camera is normally connected to one or more televisions by a simple cable. However, some vendors offer an RF (radio frequency) add-on that permits the camera to transmit its information to a TV connected receiver without wires. This capability can be critical in convincing a judge to permit counsel to bring the equipment into the courtroom.

40. *Netting the Paper Deluge*, L. INST. J., May 1997, at 36-37.

41. See Fredric Lederer, *An Integrated Approach To Basic Technologically Based Advocacy and Litigation* 27 (Aug. 1998 Working Ed.) (on file with author).

In their simplest use, a high technology whiteboard transmits writing to monitors fed from the connected computer, in the same color as that used on the board. The writing on the board can be preserved both by saving the image to disk on the attached computer and by printing it on a connected printer. One of the great advantages of the board is that once an image is saved to the computer it can be restored immediately even if the image has been erased in whole or part. Whiteboards can be especially effective for witness drawings or counsel's opening statement and closing argument.

Id.

When a person using the basic document camera wishes to point to an area or point under the camera, he or she can do so with a pointer, pen or pencil, or a finger. An electronic pointer can be added, however. A device such as a DOAR Illustrator or a "Beckler" permits the use of a light pen on a pad or on an attached computer monitor image. . . .⁴²

In its simplest form the document camera converts documents, other physical images, and objects into television or computer images. Through the use of a document camera coupled to appropriate display devices, counsel can display larger-than-life images immediately. This increases comprehension and sharply decreases the time necessary to acquaint a jury with the evidence. Further, because the document camera is portable, it can be transported among courtrooms as necessary.

Although the document camera is perhaps the most basic form of electronic evidence presentation, in most respects it is symbolic of all other forms of high-tech evidence display. "Electronically produced evidence can be defined as that evidence which originates as digital material or which is, regardless of origin, produced in court solely as digital material."⁴³ If the image produced by the document camera is offered in evidence rather than, for example, the paper document being placed under the document camera, there is no difference between the perceived evidence and evidence that originated in digital form.⁴⁴

2. Utility

Electronically produced evidence displayed on a television or computer monitor is perceived as an electronic image. The evidence is also amenable to electronic transmission, storage, and, if need be, replay. Limited Courtroom 21 Project experimental work shows that jurors are highly satisfied by the electronic display of documents.⁴⁵ Indeed, our experimental laboratory trials tell us that jurors want evidence to be presented visually to the greatest degree possible. Although they proclaim no preference for electronic visuals over traditional charts, photos, and the like, much of today's exhibits can best be presented electronically.

Judges presiding over high-technology courtrooms invariably are

42. *Id.* at 26.

43. Fredric I. Lederer, *Some Thoughts on the Evidentiary Aspects of Technologically Presented Or Produced Evidence*, 28 SW. U. L. REV. (forthcoming 1999).

44. Of course the presence of the original paper is a check on the possibility that the electronic image has been electronically altered. Although of potential importance, this does not appear critical when speaking of either the fact finder's usual perception or the ability to transmit the image electronically.

45. See also The Honorable Deborah K. Chasanow, *Juror Survey*, III ABA TECHSHOW 98, at 163 (Chicago, Ill. Mar. 28, 1998).

proponents of the technology and claim that in addition to speeding trials, the technology provides better justice because it increases juror comprehension. In 1998 the Judicial Conference Committee on Automation and Technology released the results of their assessment of certain technologies used in federal courts.⁴⁶ On video evidence presentation, defined as simultaneous display of evidence to judge, jury, and court via individual monitors, eighty-three percent of judges surveyed felt that the technology helped them manage court proceedings better and ninety percent of jurors surveyed felt that they were able to see evidence clearly and follow attorney presentations, and that the video display was an easier way to present certain evidence.⁴⁷

Anecdotal evidence in this area points to two reasons for better comprehension on the part of jurors: (1) the use of video evidence presentation makes cases more lively and engages the jury more and (2) displays on individual monitors allow jurors to read at their own speed without embarrassment.⁴⁸ Our own experience in Courtroom 21 laboratory trials bears this out. In our surveys, jurors preferred visual presentation of evidence on individual jury monitors.

Though better comprehension by jurors benefits attorneys, some lawyers have pointed out other benefits of using video-evidence-presentation systems.

46. *Courtroom Technology Draws Positive Response*, THE THIRD BRANCH (Admin. Off. of the U.S. Cts., Washington, D.C.), Aug. 1998, at 9.

47. *Id.*

48. See Samar Abulhassan, *Electronic Courtroom Galvanizes Lawyers, Jurors*, AUSTIN AMER.-STATESMAN, July 5, 1998, at A18 (discussing the United States District Judge Thomas Hogan's statement that jurors are allowed "greater scrutiny of evidence" in his high-technology courtroom and Betsy Paret's statement as the chief deputy for court administration that "[w]e have fewer jurors sleeping . . ."); Jan Ackerman, *Courts, Lawyers Are Going High Tech*, PITT. POST-GAZETTE, Sept. 20, 1998, at B1 (quoting United States District Judge Robert J. Cindrich on courtroom technology: "I see it as an attempt to increase jury comprehension and decrease the length of trials . . ."); Toni Locy, *Law Meets Technology in Courtroom No. 9*, WASH. POST, Aug. 21, 1997, at J1 (quoting juror Linda Hinnant on technology in Judge Hogan's courtroom: "We got to see the evidence while they were talking about it It gave us more time to know what they were talking about at the same time they were making the statement and asking the questions. It made you feel like you were a part of it."); Howard Mintz, *Judges Unveil High-Tech Gadgetry*, FORT WORTH STAR-TELEGRAM, May 17, 1998, at 15 (quoting United States District Judge James Ware on courtroom technology: "Jurors have come to expect that technology in the [Silicon] valley will be used They like that—they believe in it."); Angela Simoneaux, *Wheels of Justice Grinding Faster with Aid of Computer Technology*, BATON ROUGE SUNDAY ADVOC., June 1, 1997, at 1A (quoting United States District Judge Donald E. Walter on courtroom technology: "[I]t's just a better way. It's a heck of a lot better for the fact-finder . . ."); Catherine Trevison, *Judge Gets High-Tech Sidekick*, THE TENNESSEAN, Mar. 18, 1998, at 3B (quoting United States District Judge Robert Echols on courtroom technology: "I'm moving out of the 17th century It's just a way to make presentation of evidence clearer to the jury, speed the trial, and hopefully be much more efficient."); Doris O. Wong, *Judge Rubin on How to Run an Automated Courtroom*, COMPUTER COUNS., Sept. 1993, at 22, 23-24 (citing United States District Judge Carl Rubin who explained the benefit of video evidence display for juror comprehension and recounted how one juror told him that jurors may feel embarrassed to take the time they need to read a document that is handed to them and may quickly pass it to the next juror to avoid being the center of attention or consuming too much time).

Time that might normally be spent sifting through evidence and deciding what will go into evidence books is saved because everything can easily be stored and organized on a CD-ROM. An attorney might also look more organized and competent to a jury when carrying a CD-ROM into court and clicking through exhibits rather than repeatedly digging through piles of paper.⁴⁹

Anecdotal evidence from the United States and Australia also suggests that trials can be shortened by at least twenty-five percent by the use of electronically presented evidence. Yet, efficiency is not the primary goal of our legal system—justice is that goal. Justice requires as accurate a result as possible.

3. *A Best Evidence Problem?*

Electronic images of evidence that began as or exist as non-digital physical evidence are not the same as the image. "Electronic visual images of original non-digital evidence nearly always differ in some particulars from the 'hard-copy' originals. Current technology is such that even if a totally accurate image of the original is made or captured, the displayed image will differ in color and resolution."⁵⁰ These differences are rarely of significance, however. In most circumstances the color difference between the paper document and the electronic image used in court is irrelevant; the information content of the text is what is important.⁵¹ If the electronic display of evidence does not inherently raise troubling concerns, we must ask whether the use of electronic evidence and information is itself problematic.

Electronic evidence usually consists of documents' images, most frequently electronically scanned documents, photographic or other visual images, computer produced animations, and panoramic or 360 degree photographs.⁵² Audio and video recordings are also of potential value, and as previously noted, we are increasingly using multimedia depositions at trial.

49. Of course, this presupposes that counsel personally are responsible for handling evidence presentation, the favored Courtroom 21 approach. If counsel are dependent upon a technical support team, counsel will lose this advantage as well as the spontaneity that is available to the attorney who can personally adjust to changed circumstances.

50. Lederer, *supra* note 43, at ____.

51. In *United States v. Kaczynski*, No. CR-S-96-259GEB, 1997 WL 567038 (E.D. Cal. Sept. 12, 1997), the Unabomber case, defense counsel sought unsuccessfully to prohibit electronic images of the paper evidence. The trial judge held that the electronic evidence display system would not be "different from evidence mediums customarily used in court." *United States v. Kaczynski*, No. CR-S-96-259GEB, 1997 WL 583561 (E.D. Cal. Sept. 19, 1997).

52. IPIX produces a 360 degree photograph which can be rotated about the center point. To these types of evidence one could also add the electronic annotations placed on images by witnesses, as in drawing a colored "x" on an intersection graphic to show where a collision occurred.

4. *Alteration and Fabrication*

The most frequently raised question concerning electronic evidence is the possibility of alteration through undetectable digital skullduggery. To the best of our knowledge, this is technically possible. Whether it is or should be a real concern is by no means clear.

Given sufficient funds and time, we believe that the technology exists to permit at least a reasonable possibility of altered or totally fabricated electronic evidence, be it still images, digital audio, or even digital video. However, it also may be possible to fabricate traditional evidence. Therefore, it is not clear that the risk of seamless electronic forgery is substantially different from the risk of a document prepared by a highly skillful forger—at least once we accept that such a thing is possible. The evidentiary system's authentication demands are relatively slight and generally are met simply by the foundational testimony of a "witness with knowledge."⁵³ What is supposed to suffice to save us from forgery is not evidentiary rules so much as the adversary system's ability to meet evidence with credible adverse evidence, including witness testimony.⁵⁴ What the risk of alteration does suggest is the need for early pretrial discovery and disclosure of electronic evidence.⁵⁵

5. *Unfair Prejudice*

Opening statements and closing arguments lend themselves to the use of key pieces of evidence, often illuminated by counsel's own interpretation of their meaning. Counsel thus are likely to show evidentiary images to the judge or jury. In addition, as counsel are trying to make clear and persuasive points, counsel may wish to use computer-based presentation media, such as "slide shows."⁵⁶ Electronic slides permit the creative use of electronic text points, often enriched by clip art images, charts, or photographs.⁵⁷ Such slides raise the possibility of intentional insertion of "visual bias," the equivalent of semantically "loading" the spoken or written message with words carefully chosen to create a specific psychological reaction. In one early Courtroom 21 Project experiment, the plaintiff's counsel used a slide show that was designed to bias jurors against the defense. In a civil wrongful death case in which the plaintiff had died in a hotel fire, the plaintiff's attorneys set the plaintiff's slides against an angry crimson backdrop and designed, among other matters, to

53. FED. R. EVID. 901(b)(1).

54. Though a new group of experts, software forensics consultants can detect forgeries in electronic evidence. See Wendy R. Leibowitz, *E-Evidence Demands New Expert*, NAT'L L.J., Mar. 9, 1998, at A1.

55. See, e.g., MD. R. CIV. P. 2-504.3.

56. Corel Presentations and Microsoft Powerpoint are examples of such computer-based presentation programs.

57. To be effective, however, counsel should use relatively few slides and forego any images that are not critical and inherently useful.

suggest subtly a tombstone inscription. The presiding judge, Judge Roger Strand of the United States District Court for the District of Arizona, quickly sustained the defense objection. Of greater interest, however, was the jury's reaction. When surveyed after the laboratory trial, the jury reported easy recognition of counsel's intent and a significant degree of anger at the effort.

That it is possible to slant exhibits or slides through careful use of text, fonts, colors, and images is hardly news. The law has long been concerned with evidence that is unfairly prejudicial. Whether slide shows or computer animation, the same concerns and rules apply to electronic media as to gruesome photographs of murder victims. That the jury in our experiment also reacted adversely to counsel's intent to create bias is reassuring; such attempts may always backfire, whether using advanced technology or not.

No one can confidently predict that electronically produced or displayed evidence will be trouble free. More accurately, the most one apparently can hope for is that high-tech evidence will not create new problems, just the same old problems in new guises. But if electronic evidence and information are not especially problematic, the fact that we can present evidence usefully and successfully by electronic methods means that counsel can present evidence in a virtual courtroom.

6. *Jury Deliberations*

Electronic marking of a video image is transitory. No record of it exists after the image is altered or erased. When the image needs to be shown to a jury again or put in the appellate record, counsel should connect the system to a video printer and print the appropriate images as the image changes. This suggests a greater and more troubling concern: how does the jury deal with electronic evidence during deliberations? Anecdotal reports from visitors to the Courtroom 21 Project suggest that, at present, when a jury wishes to review technology-presented evidence, it is most often returned to the courtroom, and the evidence is replayed there. Sometimes, especially if the technology is straightforward, a court officer plays the evidence in the jury room. High-technology courtrooms raise the troubling question of how the jury should review the full panoply of technology-dependent evidence. At present, an adequate answer to this does not exist. Specific pieces of evidence are not troublesome, but in a case with a real-time transcript and hundreds or thousands of images, perhaps augmented by recordings of remote testimony, the problem is acute. One component of the problem is technical: we must ensure that the jury receives only admitted evidence. The other component is a combined matter of people and technology. How can we ensure that jurors can easily find and play the necessary evidence when they may be functionally illiterate, let alone computer illiterate?

Another, more substantial question, also presents itself. Jurors now have only limited access to the evidence. What would happen if they could recall and debate all of the evidence presented in the case? Would a verdict result?

Would it take less or more time? Would deliberations be improved? There are no answers to these questions at this time; experimental work is critically needed in the area.

E. Remote Witness Testimony

Our discussion of electronically presented evidence is incomplete. Witness testimony is a critical component in most trials, and our evidentiary and information discussion does not address the presentation of live witness testimony. A virtual trial is not possible without that capability.

Video depositions have been commonplace in courts for years.⁵⁸ Years ago Judge McCrystal experimented in Ohio with videotaping testimony and then playing the edited tapes to the jury in lieu of live testimony.⁵⁹ However, recorded testimony lacks the immediacy of live testimony and deprives us of the ability to use testimony from witnesses who are not in the courtroom. Videoconferencing supplies that capability, and videoconferencing for remote first appearances and arraignment has become commonplace throughout the state courts.⁶⁰ Indeed, at least twenty-nine states use or authorize videoconferencing for various proceedings.⁶¹

Satellite-based videoconferencing supplies near-perfect audio and video, but the need to access satellite uplinks makes it too expensive and inaccessible. Current ISDN "dial-up" videoconferencing permits relatively inexpensive, two-way, high-quality remote testimony from anywhere in the world.

As implemented in the Courtroom 21 Project's McGlothlin Courtroom, a 40 inch diagonal SONY TV/monitor has been installed immediately behind the witness stand. When remote testimony is to be taken, the participants in the courtroom see the life-size image of the remote witness. The remote witness sees a multi-frame TV image of four specific portions of the

58. See, e.g., Henry H. Perritt, Jr., *Video Depositions, Transcripts and Trials*, 43 EMORY L.J. 1071, 1072 (1994).

59. *Id.* at 1082; see generally Diane M. Hartmus, *Videotrials*, 23 OHIO N.U. L. REV. 1 (1996) (arguing that video testimony will make courts more efficient and fair); James L. McCrystal & Ann B. Maschari, *Will Electronic Technology Take the Witness Stand?*, 11 U. TOL. L. REV. 239 (1980) (advocating the use of more videotaped testimony in court).

60. "An Illinois court first used video technology to conduct videophone bail hearings in 1972. A Philadelphia court installed a closed-circuit television system for preliminary arraignments in 1974." National Center for State Courts, *Briefing Papers, Videoconferencing*, (visited Apr. 14, 1999) <<http://www.ncsc.dni.us/NCSC/briefing/vc.htm>>.

Although first appearances and arraignments can be combined, they are ordinarily separate procedural stages. Remote arraignments have existed since at least 1982 when Dade County, Florida, began to use two way television for misdemeanor cases. Jeffrey M. Silbert et al., *The Use of Closed Circuit Television for Conducting Misdemeanor Arraignments in Dade County, Florida*, 38 U. MIAMI L. REV. 657 (1984).

61. See Lange & Smoley, *supra* note 10, at B9.

courtroom, the speaker, and a comprehensive image of the entire courtroom. The witness can effectively see everything. And, of course there is two-way audio. Direct and cross-examination proceed as customary. Evidence can be displayed electronically via document cameras, computers, or faxed.⁶²

Such testimony is not perfect. Short audio delays that are inherent in the technology prohibit the instant interruptions common in ordinary conversation. Although video resolution and quality are good, extremely rapid movement may not reproduce properly.⁶³ Notwithstanding these constraints, Courtroom 21 Project experimental use indicates that videoconferencing is highly effective. Four experiments have indicated that jurors perceive remote witnesses just as they perceive in-court witnesses, neither better nor worse. However, we lack any experimental evidence that might indicate whether remote witnesses are more or less likely to tell the truth than in-court witnesses. Effective administration of the oath may be a significant problem; absent a treaty or special statute, cross-jurisdictional perjury may not be subject to prosecution.⁶⁴ Further, transmission from commercial videoconferencing centers or business surroundings lacks the traditional judicial surroundings thought to convey the seriousness of court testimony. Notwithstanding this, remote testimony is expanding rapidly.⁶⁵ Begun primarily in Australia's federal court,⁶⁶ the Federal Rules of Civil Procedure now expressly provide for its use:

In all trials, the testimony of witnesses shall be taken in open court, unless a federal law, these rules, the Federal Rules of Evidence, or other rules adopted by the Supreme Court provide otherwise. The court may, for good cause shown in compelling circumstances and upon appropriate safeguards, permit presentation of testimony in open court by

62. Lederer, *supra* note 43, at ____.

63. The Courtroom 21 Project uses six-channel, 384 h.320 Tandberg and Intertel videoconferencing. A lesser bandwidth will degrade the connection.

64. Victoria Evidence (Audio Visual and Audio Linking) Act 1997 § 3 (Act No. 4/1997, Victoria, Australia) inserting new Section 42G into the Evidence Act 1958.

65. Thirty-four United States district courts, encompassing 60 actual sites, use videoconferencing for prisoner civil-rights-pretrial proceedings. *Videoconferencing Links Federal Courts and Public*, *supra* note 12, at 7. The Judicial Conference authorized this use in 1996, which anticipated the Prison Litigation Reform Act of 1996 that required the federal courts to make use of videoconferencing technology in pretrial proceedings. Currently, the United States Courts of Appeals for the Second, Tenth, and District of Columbia Circuits use videoconferencing for oral arguments. *Id.* at 6.

66. Chief Justice M.E.J. Black, A Court-Based National Videoconferencing Network for Taking Evidence and Aiding in Administration, Presentation at the First Worldwide Common Law Judiciary Conference (May 29, 1995).

contemporaneous transmission from a different location.⁶⁷

Insofar as criminal cases are concerned, the United States Supreme Court has accepted, when necessary, child witness testimony via one-way video.⁶⁸ In what is almost certainly a major harbinger of the future, the Florida Supreme Court sustained a robbery conviction based largely upon the two-way video testimony of complainants testifying from Argentina.⁶⁹ The court decided that, in order for it to receive the testimony despite Sixth Amendment Confrontation Clause limits, "the procedure must (1) be justified, on a case-specific finding, based on important state interests, public policies, or necessities of the case and (2) must satisfy the other three elements of confrontation—oath, cross-examination, and observation of the witness's demeanor."⁷⁰ Having decided to sustain the conviction, the court added as a matter of policy:

We are mindful of the possible difficulty in determining when the satellite procedure should be employed. We are also aware of the possibility that such a procedure can be abused. Therefore, we are establishing the following guidelines to aid in making this decision. The determination is not simply a mathematical calculation, based on the number of alleged public policy interests or state interests. Rather, the proper approach for determining when the satellite procedure is appropriate involves a finding similar to that of rule 3.190(j) of the Florida Rules of Criminal Procedure. Rule 3.190(j) provides the circumstances under which and the procedure by which a party can take a deposition to perpetuate testimony for those witnesses that are found to be unavailable. . . .

Thus, in all future criminal cases where one of the parties makes a motion to present testimony via satellite transmission, it is incumbent upon the party bringing the motion to (1) verify or support by the affidavits of credible persons that a prospective witness resides beyond the territorial jurisdiction of the court or may be unable to attend or be prevented from attending a trial or hearing and (2) establish that the witness's testimony is material and necessary to prevent a failure of justice. Upon such a showing, the trial judge shall allow for the satellite procedure.

....

However, some important caveats exist in regards to the

67. FED. R. CIV. P. 43(a).

68. *Maryland v. Craig*, 497 U.S. 836, 853-54 (1990).

69. *Harrell v. State*, 709 So. 2d 1364, 1372 (Fla. 1998), *cert. denied*, 119 S. Ct. 236 (1998).

70. *Id.* at 1369 (citing *Craig*, 497 U.S. at 849-51).

oath, cross-examination, and observation of the witness's demeanor. First, an oath is only effective if the witness can be subjected to prosecution for perjury upon making a knowingly false statement. To ensure that the possibility of perjury is not an empty threat for those witnesses that testify via satellite from outside the United States, it must be established that there exists an extradition treaty between the witness's country and the United States, and that such a treaty permits extradition for the crime of perjury. . . .

We also acknowledge that possible audio and visual problems can develop with satellite transmission. It is incumbent upon the trial judge to monitor such problems and to halt the procedure if these problems threaten the reliability of the cross-examination or the observation of the witness's demeanor.⁷¹

Harrell v. State demonstrates that Florida accepts the fundamental concept of remote testimony in criminal cases. The decision of the United States Supreme Court to deny certiorari⁷² has no precedential impact, of course. The absence of review suggests either that the Court has no significant problem with the *Harrell* result or wishes further development of the practice and law before ruling on the procedure.

The nature of current installations shows that the use of this technology will increase. Remote first appearances or arraignments in criminal cases is one area of substantial American use of videoconferencing.⁷³ No one has made, to the best of our knowledge, an accurate inventory of the number of courts using such systems. However, the number of installations is at least in the hundreds, if not far greater. At the same time, the federal courts have experimented with remote appearances by incarcerated § 1983 plaintiffs.⁷⁴ It

71. *Id.* at 1370-72 (citation omitted).

72. *Harrell*, 119 S. Ct. at 236.

73. Statutory authorization for videoconferencing in first appearances or arraignments exists in many states. See, e.g., VA. CODE ANN. § 19.2-3.1 (Michie 1995).

74. As of 1997, 19 federal district courts were using videoconferencing for prisoner civil pretrial hearings. Lange & Smoley, *supra* note 10, at B9. There are now at least 60 separate installations. See *Videoconferencing Links Federal Courts and Public*, *supra* note 12, at 7. The benefits to the system are obvious: time saved in travel, easier scheduling, and fewer security risks associated with transporting and monitoring prisoners. Less obvious is the benefit that may come to prisoners from video-conferenced pretrial proceedings. In geographically remote areas, prisoners may actually have a hearing scheduled sooner and may get a more personal hearing via videoconferencing than they would if they appeared in person before a judge. United States District Court Judge Fred Biery from the Western District of Texas notes that most of the felony defendants in that district were handled in a courthouse where there was no full-time judge, and the defendants were bused from all over the district. *Id.* at 6. The sentencing hearings were held once a month, and 50 to 60 sentencings were handled that day. Judge Biery explained that, "These weren't complicated cases. But it was very impersonal."

was expected that the companies selling these systems would attempt to expand their sales via systems designed for other uses, and that is now occurring. Jefferson Audio Video, Inc., for example, has installed remote witness testimony locations from which police forensic chemists can testify. During the 1998 Australian Institute of Judicial Administration Conference in Melbourne, the State of Victoria demonstrated a two-way connection to its forensic laboratory, illustrating how a forensic chemist, in a lab setting, could testify without coming to court. At the same time, the large number of courts and jurisdictions that have invested heavily in this technology are already seeking additional uses to justify their capital investments.⁷⁵

The courts are using videoconferencing for far more than witness testimony. Police, for example, have sought arrest warrants by two-way television.⁷⁶ The courts have shown a greater interest, however, in remote appearances by counsel and judges, an area now developing rapidly.

The United States Court of Appeals for the Second Circuit⁷⁷ provides remote locations for counsel appearances. The court first experimented with live, remote video oral argument in October 1996.⁷⁸ The court then formally adopted remote video oral argument in the spring of 1997 and established video links in four locations (Albany, Mineola, and Rochester, New York and Hartford, Connecticut). The Second Circuit encompasses New York, Connecticut, and Vermont, and sits in Manhattan; therefore, the advent of remote oral argument has proved to be a significant benefit to attorneys who previously had to travel all day for a ten-minute argument before the court.⁷⁹ The circuit executive has noted that the judges do not feel there is an advantage

Id. at 7. Now the court handles eight to ten sentencings each Thursday:

"We do them individually and we give them the attention I think they deserve. The majority of the defendants don't speak English, so we use a translator. I think with the videoconferencing the defendant has a better perspective on what is happening. With the cameras, it's like they are sitting six feet away. There is a one-on-one relationship that just wasn't possible before."

Id. (quoting Judge Bicer). Videoconferencing is used in many federal bankruptcy courts for a wide range of matters and is of particular benefit because of the many hearings required by federal bankruptcy law. Pilot projects have begun in Texas and Iowa. *Id.* at 7-8.

75. Many of the district courts that installed video equipment for prisoner suits are also using their videoconferencing capability to hear witness testimony in trials. *Id.* at 7.

76. Scott Marshall, *Gwinnett Police Go On Line for Warrants: Video Testimony Speeds Arrests; May Not Be Legal*, ATLANTA J. AND CONST., Apr. 12, 1995, at B4.

77. The United States Courts of Appeals for both the Tenth and District of Columbia Circuits also use videoconferencing for remote appearances. *Videoconferencing Links Federal Courts and Public*, *supra* note 12, at 6.

78. Lange & Smoley, *supra* note 10, at B9.

79. Mark Pazniokas, *Video Justice Is Catching on in Legal Circles*, HARTFORD COURANT, May 7, 1997, at A3; Robin Topping, *Hearings Linked by Video Conferencing*, NEWSDAY, Apr. 23, 1997, at A29.

to personal appearances in court.⁸⁰

Victoria, Australia demonstrated the ability, in an emergency, to bring in a substitute judge via videoconferencing from hundreds of miles away within an hour of the scheduled court appearance.⁸¹ The Courtroom 21 Project hosted the United States Court of Appeals for the Armed Forces on March 15, 1996. The Court heard *United States v. Salazar*⁸² in the McGlothlin Courtroom, with two of its five judges appearing by separate videoconferencing systems.

The use of technology to assist those with hearing, vision, mobility, or other problems is of particular importance. Internet-based videoconferencing proved to be critical in one such case. Relying on the decisions in *Harrell v. State*⁸³ and *United States v. Gigante*⁸⁴ and taking them a step further, a New Jersey Superior Court judge granted a plaintiff's application to testify and observe the trial from his apartment via a videoconferencing link over the Internet. The plaintiff, who is paralyzed from the neck down and breathes with the aid of a respirator, stated that he was too weak to travel from Chicago to New Jersey for his medical malpractice suit against several New Jersey doctors and that the cost and time involved in enabling him to travel would be prohibitive. The judge agreed and, to allay the defense attorneys' fears that the plaintiff could be coached in his testimony, appointed a retired judge to monitor the plaintiff in his apartment during the proceedings. In a letter accompanying the order, Judge Anthony J. Sciuto stated:

Why should this court, or any court, fear to tread into an area of advanced technology? To permit the plaintiff to testify via Real Time Video teleconferencing will enable the plaintiff to have the benefit of viewing the trial, and testify live via the Internet where he would otherwise not be present in court due to his medical condition. . . . Permitting this plaintiff to view the trial and testify via the Internet clearly supports our [c]ourt's public policy to permit handicapped individuals access to our courts. This, in my opinion, is an essential and appropriate step for modern technology to assist in permitting all people equal access to justice.⁸⁵

80. Glasner, *supra* note 27, at T4.

81. As reported at the Australian Institute of Judicial Administration Conference held in Melbourne, Australia on March 23, 1998.

82. 44 M.J. 464, 465 n.1 (C.A.A.F. 1996).

83. 709 So. 2d 1364, 1369 (Fla. 1998), *cert. denied*, 119 S. Ct. 236 (1998).

84. 971 F. Supp. 755, 756 (E.D.N.Y. 1997) (noting that the witness's illness prevented a court appearance and a deposition would pose a safety risk to his placement in the witness protection program).

85. Letter from Judge Anthony J. Sciuto to Counsel in *Turcinovic v. Floch*, No. BER-L-16422-90 (N.J. Super. Ct. 1997) (Jan. 6, 1998) (on file with author); *see also* Christopher Mumma, *Paralyzed Man to Testify Using Internet Link, Ruling in Malpractice Case Believed to Be a First for N.J.*, RECORD (N.J.), Jan. 9, 1998, at L3.

The plaintiff did testify via the Internet, and the parties settled the case after that testimony. The same technology permits broader access by the public to trials than ever before.⁸⁶

The assumption that lawyers might be reluctant to appear via video appears questionable. The Ninth Judicial Circuit of Minnesota currently is engaged in a pilot videoconferencing project. All courthouses in that large and predominately rural circuit are linked on a T-1 network, and use of videoconferencing is encouraged in civil cases (court rules forbid use in juvenile and criminal proceedings). Judge James R. Wilson notes that he finds videoconferencing very beneficial and would like to see the restrictions on its use lifted in his circuit.⁸⁷ He also notes that attorneys have embraced it because it was not uncommon for them to travel 300 miles for appearances. There have even been proceedings in which participants have appeared from three remote locations. However, Judge Wilson does point out one drawback. Some attorneys in his circuit want to appear via videoconferencing for every matter, but accommodating their remote appearance in a simple matter can take more of the court's time (for setting up and shutting down equipment) than a physical appearance in court.⁸⁸

Remote appearances and testimony are the key elements in virtual trials and virtual courtrooms. That we are likely to proceed further in these directions might also be extrapolated from the Florida Supreme Court's decision in *Harrell*:

Our Court is mindful of the importance of today's decision. Yet, we are also mindful that our society, and indeed the world, is in the midst of the Information Age. Computers are the norm in American households and businesses; an infinite amount of information is available at our fingertips through the Internet; and satellite technology allows us to travel the world without ever leaving our living rooms.

The legal profession has also benefitted from these technological innovations. Legal research that once took hours or days is now available in seconds through computer and Internet databases. Clients can reach their attorneys anywhere in the world through the use of cellular and video

86. Judge William Mauer's courtroom in Kansas City, Missouri, has been high-tech for a few years; it is equipped with a document camera, a computer evidence-presentation system, and is enabled for videoconferencing. Now the courtroom will also double as a virtual classroom; additional cameras are being installed to allow trial broadcasts over the Internet for viewing by law school classes. Interview by Susan Hobbs with William Mauer, Judge, Kansas City, Mo. (Oct. 26, 1998).

87. Telephone Interview by Susan Hobbs with James R. Wilson, Judge (Oct. 27, 1998).

88. *Id.*

innovations. The list goes on and on.

Indeed, our very own Court takes pride in the recent technological advancements that have been made. Oral arguments before the Court are broadcast live via satellite throughout the state. These same arguments can be viewed online, along with the parties' briefs. The Florida Supreme Court Website has received worldwide acclaim for opening up the courthouse doors to the general public. All of these steps provide greater access to the judicial system, which in turn increases public trust and awareness.

That being said, it becomes quite clear that the courtrooms of this state cannot sit idly by, in a cocoon of yesteryear, while society and technology race towards the next millennium. Fortunately, the courtrooms of this state have not been idle, nor are they speeding at a reckless pace. Recent changes in the courtroom have included the use of audiotape stenographers as well as video transmission of first appearances, arraignments, and appellate oral arguments, just to name a few.

We recognize that there are generally costs associated with change. Nevertheless, technological changes in the courtroom cannot come at the expense of the basic individual rights and freedoms secured by our constitutions. We are confident that the procedure approved today, when properly administered, will advance both the access to and the efficiency of the justice system, without compromising the expectation of the safeguards that are secured to criminal defendants.

Our nation's Constitution is a living document that has stood the test of time and change. This point is exemplified by the fact that our Constitution is still viable today—some two hundred-plus years after our country's birth. There was no way the founders of this nation could have foreseen the innovations that would take place throughout our country's lifetime—changes that, up to this point, have included advances in communication, electricity, train, airplane, and automobile transportation, and even space exploration. Nor can we predict today the changes yet to come. But we can say with certainty that our Constitution, as well as this great nation, can endure any future changes while at the same time ensuring that individual rights and liberties will be upheld.⁸⁹

89. *Harrell v. State*, 709 So. 2d 1364, 1372 (Fla. 1998), *cert. denied*, 119 S. Ct. 236 (1998).

IV. THE INTEGRATED, HIGH-TECHNOLOGY COURTROOM

Thus far, we have reviewed many of the courtroom technologies that already are taking hold in our legal system. The whole is at least the sum of its parts, and sometimes the whole is different, and perhaps even greater. Accordingly, we now turn to what happens when these disparate technologies are brought together in today's integrated, high-technology courtrooms.

All true high-technology courtrooms are characterized by one core capability, a multi-faceted, technology-based evidence presentation system. Ordinarily, such a system will consist of at least a television-based document camera and a display system able to display not only what is placed under the camera, but also, and critically, computer output. The computer input may stem from one or more installed desktop units, from a notebook computer supplied by counsel and connected temporarily to the display system, or a combination of these. The display system may consist of televisions, computer monitors, or large front or rear projection systems. Usually a combination of these systems is used. However, an evidence display system does not alone create a true high-technology courtroom.

The Courtroom 21 Project definition of a high-technology courtroom also requires a high-technology court record system and the capability for remote witness testimony by two-way, high-quality videoconferencing. In the past, the Courtroom 21 definition assumed at least significant computer-based research and information retrieval capabilities from the bench. That is now part of the Project's formal definition as well.

In short today's high-technology courtroom is the hub of a substantial amount of electronic information interchange. Although not yet a true virtual courtroom, it is apparent that key aspects of a virtual courtroom are present in the current high-tech courtroom. The uses and effects of the electronic information exchange that characterize even today's technology-augmented courtrooms raise substantial questions, which would also accompany any discussion of virtual trials and virtual courtrooms.

V. TROUBLING QUESTIONS

Any evaluation of today's high-tech facilities necessarily raises the following questions:

- Do they work?
- Do they improve the administration of justice?
- What is necessary to create and operate these facilities?
- To what extent, if any, do they disadvantage some parties, counsel, or others?
- What are the collateral consequences of high-technology litigation?
- Are technology-augmented litigation and high-technology courtrooms consistent with traditional humanistic goals?

These are far from unimportant matters; our future depends upon their answers. In September 1998, deeply concerned about the direction that our legal systems are traveling, the Courtroom 21 Project, supported by the William & Mary Bill of Rights Institute and the American Bar Association Sections on Litigation and Criminal Justice, conducted an international Working Conference on Technology-Augmented Litigation. The threshold question considered was whether large-scale technology use at trial was desirable or hurtful. Attended by judges, lawyers, administrators, support professionals, and experts in the area, the Working Conference concluded that:

- The adoption of courtroom technology was ongoing and likely unstoppable;
- Courtroom technology was desirable;
- Known problems involving electronic incompatibility of evidentiary files required resolution through the creation or adoption of standards;
- It is too early in the adoption of technology to attempt to regulate its use in any thorough fashion, but the liberal use of pretrial notice and disclosure is at least helpful in avoiding problems.

Upon the unanimous request of the attendees, a follow-up meeting has been scheduled for March 2000. The Working Conference's conclusions support continued use of technology, but emphasize critical questions concerning high-technology courtrooms.

A. Do They Work?

The technologies, and the courtrooms that use them, work and generally work well. There is an amazing amount of interest in obtaining these technological capabilities throughout the United States and much of the world. This is not to say that specific technologies or products do not sometimes present difficulties. In general, however, the technologies work. Further, although careful scientific studies are necessary to validate these conclusions, it appears clear that technology use can, and often does, improve administrative efficiency, shorten trials, and improve fact-finder comprehension of evidence. Insofar as we can tell, however, courtroom technology is not itself sufficient to overcome inadequate evidence. We suspect that all technology does for an inadequate lawyer is make that inadequacy even more apparent.

But potential technological success is not the same as real success. Anecdotal evidence and internal experience gathered by the Courtroom 21 Project before and during the Working Conference predictably yielded the perhaps obvious, but nonetheless sobering, conclusion that most lawyers are disinclined to use courtroom technology. Insofar as we can tell, the high-tech courtrooms that are the most successful are those in which judges have not only provided training for the lawyers, but have also required that counsel use the technology. From our interviews and inquiries, we conclude that successful high-tech courtrooms require that their judges be enthusiasts. Bench-bar partnerships are also essential for success, but it is unclear whether they are

sufficient.

We are now seeing the first law school students for whom computer use is routine and self-evident. We would have thought that such familiarity and expertise would be sufficient to result in a desire to use courtroom technology. Although that has helped, it too has not been sufficient.

Beginning with the Class of 1999, the William & Mary Law School added mandatory courtroom technology training to the Legal Skills curriculum, effectively making it a graduation requirement. As a result of small group, hands-on instruction during the 1997-98 academic year, we found that the optional use of our courtroom technology during student trials rose sharply. We initially concluded that small group, hands-on instruction was the key to increased technology comfort and use, which seemed quite logical. Once student lawyers overcame their lack of familiarity and possible unease and discovered how simple technology use could be, we expected and received sufficient quantitative improvements in use. Unfortunately, it appears that the situation is more complicated than originally presumed. Many of those same students are now taking elective Trial Advocacy during which they must try jury trials in front of a sitting federal or state judge. There is less use of the courtroom's technology in those trials than we would have expected. The determining factor may be that the faculty teaching the course seldom use the technology,⁹⁰ but we had anticipated greater motivation on the part of the students.

The training situation is still more complicated. At present a number of high-technology courtrooms, such as that of United States District Judge Donald Walter, supply counsel with orientation training. That training is understandably short and primarily oriented towards equipment operation. The Courtroom 21 Project-preferred litigator training curriculum takes about twelve hours, covers a wide range of associated topics, and integrates equipment operation into trial practice instruction. As observed by Susan Hobbs, Courtroom 21 Project Associate Director for Research and Publications, if courts or firms suggest that more than a few minutes of hands-on training is necessary to use high-tech evidence presentation options profitably, a major time and psychological barrier to such use may be erected.⁹¹ At the same time, supplying only a few minutes of training erroneously and misleadingly suggests that limited training is all that is truly necessary.

We conclude that lawyer willingness to use courtroom technology may be the determining factor in its success.⁹² However, lawyer willingness may not

90. Like practitioners, law students also are under time constraints. If they perceive that technology use, such as preparation of a computer slide show, will take time not necessary for a traditional presentation, we can assume that most will forego the opportunity when they do not see visible gain resulting.

91. Courtroom 21 Project Senior Staff Meeting (Oct. 29, 1998).

92. We must also distinguish between a lawyer's willingness to use the technology personally and the lawyer's desire to have staff sit in the courtroom and do so. We believe that the first is far preferable to the second, but that requires a high level of self-confidence on the

remain a problem. Setting aside those situations in which the court mandates such use, thereby resolving the problem, increased recognition of the value of the technology for winning one's case is likely to impel its adoption by lawyers. If nothing else, the adversary system should drive adoption, as counsel increasingly will be afraid that failure to use technology when one's opponent does so is an unacceptable risk.

B. Improving the Administration of Justice

What "improves" the administration of justice is clearly a question of judgment. Initially, decreasing the time and cost necessary to resolve a dispute would appear to be in the interests of justice. Also, improvement in fact-finder comprehension should lead to improved accuracy in result. Assuming that these results do in fact flow from the use of courtroom technology,⁹³ problems may yet remain. Most civil and criminal cases are resolved by settlement. At least in the abstract it is possible that decreasing the cost and delay now inherent in adjudication in most jurisdictions could be counter-productive. On one hand, some degree of delay is probably necessary for many litigants so that they can recover from the initial emotional commitment to their ultimate goals and achieve a somewhat greater degree of detachment, permitting a more realistic case appraisal.⁹⁴ On the other hand, current delay and costs impel settlement. If barriers to trial are lightened, it may be that more cases will go to trial. This, of course, is not necessarily bad—"Justice delayed is justice denied." If we are now discouraging meritorious cases from trial, we should eagerly embrace increased efficiency even if it causes an increased caseload.

Technology-augmented litigation has been embraced by many trial lawyers largely because the lawyers believe it enhances their ability to persuade juries. Although we should prize and encourage anything that enhances fact finding accuracy, we should be deeply concerned about any technique that increases the risk of a verdict justified more on emotion than fact. Presently, there is reason to believe that technology creates special risks of such an unacceptable result. However, further experimental work and monitoring of real cases in this area would be desirable.

C. What Is Necessary to Create and Operate These Facilities?

Creation of high-technology courtrooms requires:

- careful systems analysis, including candid evaluation of the way that trials are conducted in that court;
- courtroom-specific design;

part of the lawyer.

93. See *supra* note 46 and accompanying text.

94. There seems little chance that today's technology-augmented litigation would be so efficient as to cause such a problem. The same might not be true for a truly virtual system.

- technology acquisition;
- installation;
- operation;
- training; and
- maintenance.

Although adequate funding obviously is necessary, the primary expense in installing these facilities is for the actual wiring, which can be very costly if it must be retrofitted into an existing, historical facility. Maintenance should not be significant when the facility is properly designed; courtroom technology should be straightforward and unlikely to fail.

Some form of maintenance clearly is necessary. Normal maintenance will likely consist of adjusting monitors, correcting altered switch settings, or finding where someone has unplugged equipment. If a monitor fails, someone must be able to replace it with a spare. More sophisticated maintenance, perhaps including an outside maintenance contract, is necessary for less likely but more serious failures.⁹⁵

Operation and training are hard to quantify. When designed pursuant to the Courtroom 21 Project's requirement of simplicity, the judge⁹⁶ or deputy clerk should be able to operate the courtroom without needing a special expert. However, training will likely be an ongoing necessity in the short term. That responsibility must either be transferred to the bar or institutionalized in the courthouse staff. Any installation that requires new staff should be scrutinized carefully; high-technology courtrooms should decrease costs, not increase them.

D. To What Extent, if at All, Do High-Technology Courtrooms Advantage or Disadvantage Parties, Counsel, or Others?

One of the most fundamental questions raised by augmented technology, and high-technology courtrooms in particular, is whether they potentially disadvantage key participants in the process. The threshold question is whether the cost of equipment and the case-specific preparation that requires office access to technology effectively prohibits small firms, solo practitioners, and *pro se* litigants from technology use. Courtroom technology potentially includes not only inexpensive, straightforward methods of evidence presentation such as document cameras, but possibly includes costly document scanning and expensive methods such as computer animation production. Choosing to proceed via the expensive route is a gamble; even if the case is won, the results may not justify the expense. In 1995, for example, the California Court of Appeals vacated a jury's award of costs to a prevailing party because it deemed "high-powered computer support" did not fall within

95. The Courtroom 21 experience is that normal courtroom equipment seldom fails. However, networks can be perennial problems.

96. Lawyers operate the evidence-presentation equipment under judicial control.

the definition of litigation expense.⁹⁷ The court focused on a controversial aspect of high-tech litigation, noting that "[i]f costs are routinely awarded for high-powered technology, most parties will be unable to litigate."⁹⁸ The goal, of course, is to make litigation affordable—certainly not more costly. But even the basics potentially cost money that a lawyer or litigant may not have.

Ad hoc technology use raises the financial question squarely. If we assume that both parties to a trial have access, albeit distinctly uneven access, to trial technology, the problem does not appear to be acute. Modern computer technology has gone a long way toward equalizing solo practitioners and large law firms. Although the imbalance remains substantial, it is far narrower than it was before technology. A solo practitioner with computer technology can conduct wide ranging research, prepare and file pleadings and motions, and prepare high-technology evidence presentations and exhibits in a fashion incalculable a generation ago. In these circumstances, the difference in ability is arguably quantitative and not qualitative. Further, as United States District Court Judge Kathleen O'Malley has noted, many lawyers from small firms and solo practitioners are more computer-adept than lawyers at large firms because they must rely on themselves and not consultants or support staff.⁹⁹ The real question is what happens when one party has technology and the other has no meaningful access.¹⁰⁰

An indigent client represented by a solo practitioner, opposed by an affluent client who has retained a large firm, is at a serious, potential disadvantage if the large firm uses technology. Even if the large firm provides the courtroom technology and either voluntarily or under judicial direction permits the solo practitioner to use its technology, the solo practitioner may lack either the training or the outside access to technology to permit effective use. Of course, this is hardly a new dilemma. Unequal legal representation is a constant in our system, and terribly mismatched counsel does not justify relief unless counsel for one party is legally inadequate.

97. *Science Applications Int'l Corp. v. Superior Court*, 46 Cal. Rptr. 2d 332, 333, 337 (Ct. App. 1995). Specifically, the court allowed recovery of expenses for "graphic exhibit boards" (\$57,969) and an evidence video (\$101,908), but disallowed recovery for document control and a case management database (\$200,000), the production of laser disks for evidence storage (\$47,481), the rental of graphics communications system equipment for trial use (\$9,916), fees for an on-site computer technician during trial (\$11,983), and fees for editing video depositions for better jury presentation (\$35,652). *Id.* at 336-37.

98. *Id.* at 338. The court went on to criticize the use of technology in this case, pointing out that the prevailing party was awarded damages of \$1 million but had litigation costs of \$2 million. *Id.* The court concluded that "[i]f a party litigant chooses unwisely to expend monies in trial presentation in excess of the value of the case, utilizing advanced methods of information storage, retrieval and display, when more conventional if less impressive methods are available, the party must stand his own costs." *Id.*

99. Mark Rollenhagen, *A Courtroom Revolution*, *PLAIN DEALER* (Cleveland), Sept. 21, 1998, at B1.

100. Anecdotal evidence suggests that in criminal cases the defense is permitted to use technology owned or rented by the prosecution. The situation in civil cases is far less clear.

However, even if the mismatch of technology versus non-technology is simply a new form of a continuing systemic deficiency, that alone does not justify dismissing the problem. Once at trial, the question of fairness really becomes one of equal access to courtroom technology. The institutional, high-technology courtroom is one answer to this dilemma. If all parties are supplied with a courtroom that comes complete with necessary technology, rather than just a display system for evidence or presentations created by the litigants' own equipment, the technology imbalance is in large measure redressed. When the court provides a high-tech forum, it is also providing a level playing field. The only issues left are the lawyers' inclinations and know-how, which are largely a matter of preparedness. Thus, the question is raised, can lack of technology or the training or willingness to use it constitute "inadequacy"?

Ethically and legally, a lawyer must be *competent*. The definition of competence is open to debate, but surely we can agree on some key points. For example, is a lawyer who cannot perform basic legal research "competent"? If not, are we fast approaching the day when a lawyer who cannot perform electronic research will not be competent? As our society becomes more technologically based, our definition of "competence" must adjust. Given such realities I believe that both law firms and law schools must consider how to deal with the impact of legal technology.

At the most obvious level, I would argue that to be "competent," litigators must know what technological assistance is available to them and *how to use it*.¹⁰¹

It seems unlikely that current standards would define an inability or refusal to use courtroom technology as ethical inadequacy or legal malpractice. But if courtroom technology continues its expansion into the court system, it is increasingly likely that technological proficiency will be such a requirement. Of course, if technological prowess is not yet required, how can we expect the vast multitude of lawyers to cope with a virtual courtroom? The adversary system itself may be at least a partial answer. In a recent trial in Maryland, a defense attorney objected unsuccessfully to the prosecutor's use of a computer slide show during closing argument. He admitted to reporters that the enhanced closing argument made his own effort appear "slipshod in comparison."¹⁰²

Even if a lawyer's inability to use technology does not constitute an ethical problem, we are left with a sobering question of public policy. If technology

101. Fredric I. Lederer, *Courtroom Technology and Its Educational Implications*, 8 VA. EDUC. & PRAC. 3 (1998).

102. Joan Jacobson, *High-Tech Justice For All?*, BALTIMORE SUN, June 8, 1998, at 1C.

assists a litigator, and thus the represented party, technology is at least a significant factor in representation. What happens when a trial includes a *pro se* litigant who either has no ability to use technology or lacks the access to it? The Courtroom 21 Project approach has been to encourage courts to install basic evidence presentation systems, complete with computers, rather than to provide only connections for laptop computers to the display systems. The Project's rationale is that this affords the *pro se* litigant or solo, non-computer-supported practitioner with at least the opportunity to present a case electronically. This position was ultimately supported by the Courtroom 21 Working Conference because it attempts to redress unequal access to justice. Unfortunately, although well-intentioned, it is probable that the well-intended position is a makeweight with little practical value. Absent personal and continued access to technology, it is unlikely that a litigant or practitioner will be able to use successfully even basic court-supplied technology. This is a qualitative difference and is, or should be, troubling.

Although technology clearly has presented us with a sobering question of access, it has also brought blessings to those who suffer from hearing and other problems. Hearing-impaired individuals who can read can serve as jurors, counsel, and judge thanks to real-time transcription, including real-time information displayed as closed captioning on monitors. Infrared systems help those who can hear, but do not hear well. The degree to which technology can assist people with other concerns is unclear at present, but it is clear that substantial benefits are available.¹⁰³ The Courtroom 21 Project recently added a medical doctor to its staff as Assistant Director for Adaptive Technologies and Ergonomics. It is our hope that research in this area will point the way to assisting many of those who are now disadvantaged.

E. What Are the Collateral Consequences of High-Technology Litigation?

One of the difficulties in evaluating the impact of high-technology litigation on courtrooms is that its collateral effects are so unclear. We believe that when used properly, technology can improve efficiency and save trial time. On occasion, however, the overall situation might be viewed as a balloon; press in at one point and at some other location the balloon will bulge out. It may be that the savings in trial time are offset by increased, pretrial lawyer preparation. The cost savings at trial may be offset by the costs of document scanning. We simply do not know enough about the overall economics involved.

At the same time, human ability questions are pressing. If technology use is to be commonplace, how many lawyers and judges will be unable, or unwilling, to adapt? Is the process of trying a case electronically significantly different from traditional modes? When the Courtroom 21 Project conducted

103. See Lederer, *supra* note 43.

a two-day program for the ABA Litigation Section's Trial Evidence Committee, several lawyers felt that document display on jury monitors created a form of psychological distance from those documents.

F. Are Technology-Augmented Litigation and High-Technology Courtrooms Consistent with Traditional Humanistic Goals?

Courts serve two primary functions in our society: they resolve disputes,¹⁰⁴ and they deliver justice to litigants to the degree possible in a system conducted by fallible people. Courts are preeminently human creations. People view the courts as places in which justice is administered by the people's agents. The normative model, accepted by most of the nation,¹⁰⁵ is a jury sitting as fact finder and verdict giver, applying the law, as explained by the judge, to the facts. Trial lawyers apply their understanding of human psychology in an attempt to convince judges and jurors of their case interpretations; the judge and jury determine facts by filtering human evidence through their own experiences. Interestingly, courts are hostile to non-blood typing/DNA probability evidence in part because it is thought to remove humanity from adjudication.¹⁰⁶

From the comments of visitors to the Courtroom 21 Project, the ultimate threat to the judicial system from technology-augmented litigation is loss of humanity. Traditional litigation places the lawyer at the focus of the fact-finder's attention. Papers are shown to human witnesses in the courtroom, charts are placed on easels, and lawyers add emotion to logic in closing arguments. Even the tribulations of the participants, hours wasted by waiting witnesses and inactive jurors, are classic human complaints. Verdicts are sometimes the ultimate examples of human conflict as jurors, sometimes literally "locked up" together, struggling to reach resolution, if only to terminate their forced togetherness.

Enter technology-augmented litigation; enter the high-technology courtroom. Evidence consists primarily of electronic images. Counsel rarely leave the centralized litigators' podium or the counsel tables. Remote first appearances and arraignments, common in hundreds of courts, result in the accused seeing the judge who determines conditions of release and other critical factors by two-way television, perhaps leaving a nagging observation in the mind of the accused: if they really cared, wouldn't they take me there?

Important testimony at trial is increasingly given by faces in televisions,

104. Of course, most cases never make it to trial. One can reasonably argue that the primary function of courts is to impel pretrial settlement on pain of possible trial.

105. The model is accepted notwithstanding distrust of the system in some population groups.

106. As to probability and the courts generally, see PETER TILLERS & ERIC D. GREEN, *PROBABILITY AND INFERENCE IN THE LAW OF EVIDENCE* (1988) (analyzing courts' acceptance of probability evidence).

albeit live interactive faces, and we are beginning to see more and more remote judges and counsel. Could it be that as we improve efficiency we risk minimizing the humanness that has characterized our trials? Absent future experimental work, we cannot even hazard a guess as to the reaction of jurors¹⁰⁷ or the general public. The views of the surveyed judges and attendees of the Courtroom 21 Project Working Conference on Technology-Augmented Litigation are quite positive about technology use. Conceding lack of sufficient experimental data in the area, we posit the following:

- Technology use is not troublesome per se;
- Should technology use increase past a certain, unknown point in any given case, jurors, observers, and perhaps legal professionals may become uncomfortable;
- If highly expansive technology use becomes sufficiently commonplace to penetrate the national consciousness, and if the changing and expanding nature of national technology use does not itself change general societal expectations, the courts might lose the degree of general acceptance that currently results in acceptance of most verdicts.

Assuming the above, it is now appropriate to turn to what may well be the next major step in high-technology litigation and courtrooms: virtual trials.

VI. TOMORROW'S POSSIBLE VIRTUAL COURTROOMS

Inasmuch as no true "virtual courtroom" exists as yet, one can define the concept with an unusual degree of liberty. We will assume for purposes of this Article that a true virtual courtroom is not a physical location; rather, we consider it the interchange of high-quality audio, video, text, and graphical information among trial participants without concern for the physical location of those participants, except for jurisdictional requirements.

The beginning of Web-based interactive instruction makes it clear that a virtual court based upon exchange of text and audio is now possible. David Johnson, founder of Counsel Connect, has demonstrated how to propose a resolution of certain disputes entirely via the Internet.¹⁰⁸ We assume that this type of information exchange is per se insufficient as a substitute for the traditional form of courtroom adjudication. This is based upon the assumption that most people would reject as inaccurate or unjust decision making that is not accompanied by contemporaneous viewing of witnesses, jurors, counsel, and judge.¹⁰⁹ Certainly, the commercial rush to incorporate audio and video

107. This refers to reactions other than the expressed satisfaction with the technology during Courtroom 21 Project experimental lab trials.

108. See Daniel E. Harmon, *Panelists' Wake-Up Call: Future Is Here, for Lawyers*, Law. PC, Sept. 15, 1995, at 1-2 (reporting on David Johnson's presentation at the ABA Techshow '95 session, "Vision of the Future").

109. There is also a compelling Sixth Amendment argument that in criminal cases government testimony without demeanor would fail the "confrontation" requirement of the Bill of Rights. However, this assumption should be tested scientifically.

into the Internet suggests the importance of those communication components.

Given our assumption that live video is necessary, we will define a true virtual courtroom as one in which all of the participants can be in different physical locations. All trial components, including opening statements, evidence, closing arguments, instructions, and jury deliberations occur via electronic information exchange. The courtroom exists only in the data exchange network. The true virtual courtroom is, therefore, a cyber courtroom.

The virtual courtroom would be a courtroom in which participants, all of whom might be located physically elsewhere, would appear together electronically with each one perceiving the others, and the courtroom as if they were all in the same physical location. This concept is not a new one—at least in the world of science fiction. Many American television viewers would think of the Enterprise's "holodeck" in the various Star Trek series. Such a concept has more reality than one might expect. Virtual reality now exists via a Cave Automated Virtual Environment ("CAVE").

A CAVE is about the size of a walk-in closet. Step inside, put on 3-D glasses, and suddenly you become part of a computer animation

....

There are more than 100 CAVEs at universities, government facilities and companies They help engineers see 3-D, full-size models of cars and enable scientists to walk inside models of single molecules.¹¹⁰

A CAVE would yield a courtroom that exists only in a data network, but one which human senses would experience as a physical courtroom with all participants present. However, such a courtroom exists only in science fiction—at least for the mid-term future. Today's virtual cyber courtrooms are far more limited in scope. They permit participants to share the litigation information and to intercommunicate, while remaining physically distant.

A. Technology: How Close to a Useful Virtual Courtroom Are We?

Our review of existing courtroom technologies leads to the unavoidable conclusion that all of the technological pieces necessary to create a virtual courtroom are either now in use or will be commercially available in the immediate future. Significant technology questions exist concerning the switching and distribution system that would be necessary to "construct" or "carry" a virtual courtroom. Positing a set-up in which all participants can view each other and the evidence requires a system that can receive those

110. Kevin Maney, *Virtual Spelunkers' Reality: Business World Exploring CAVEs*, USA TODAY, Nov. 3, 1998, at 1B.

images and distribute them as constrained by evidentiary and procedural rules. At present the Internet would be the obvious mechanism, with the "courthouse" acting as central control. An Internet-based system would also answer the need for a "public" trial because huge numbers of people can concurrently view a given Web site. However, today's normal Internet access provides insufficient bandwidth to carry sufficiently high-quality video, to say nothing of the many different images required. At the same time, rapidly improving Internet access, including the new Internet II, suggests that the bandwidth issue will be resolved in the near future.

The technology problem does not stem from the theoretical availability of specific mechanisms which, if combined, could create a virtual courtroom. The real problem is the limited access to the technology. Our legal system exists for all people, and we cannot and must not exclude those who lack the financial means to afford personal technology or those who, for a variety of reasons, cannot use technology. A true virtual courtroom presupposes easy access by all potential trial participants, including jurors. Although technology is sweeping the United States, such ubiquitous technology access seems unlikely, if not impossible, for jury trials in the near or intermediate future.

However, to define the virtual courtroom in such a purist fashion as to define it out of existence goes too far. The core of the problem is the jury. The goal of having every participant appear remotely from a location of that person's choosing is simply not likely to be practical any time soon. But, a partial virtual trial could be accommodated and a virtual courtroom created if the court required the jury to meet in person, or if jurors needing technological support could report to local courthouses¹¹¹ for an electronic connection to the proceedings.

Thus far, this discussion has focused on jury trials. Although a jury trial is the normative rule in the United States, most of our cases are not jury trials—they are bench trials of varying importance. Freed of the need for a jury, virtual trials and courtrooms become much easier to institute.

B. Bench Trials, Including Traffic Court and Administrative Proceedings

Most trials and hearings in the United States are without juries. Whether administrative, civil, or criminal, the judge, counsel, witnesses, parties, and associated court personnel and support staff characterize the trial. Although perhaps distressing to some members of the bar, courts could require attorneys to use remote appearance facilities. Witnesses and parties could appear either from their own remote, camera-equipped computers, or from public terminals located in high-traffic areas, such as shopping malls. In some administrative cases, the claimant may be the only witness. In the simplest criminal case, a

111. Courthouses could be made virtual, too, but a number of courthouse features would lend themselves to physical location. If nothing else, jails and the like could easily handle certain additional functions.

minor traffic infraction, a virtual courtroom would be easy to create and likely regarded as a blessing by most. Rather than taking substantial time from work or other pursuits to challenge a traffic ticket, defendants could use remote equipment to do so. Police officers could appear remotely from their station or other appropriate location. Given its electronic nature and the probable lack of need for a text-based transcript, electronic recording of the proceeding would make a sufficient record. In the event of conviction and sentence, defendants could pay fines by electronic funds transfer or credit card. The same analysis would apply to small claims court or any other relatively straightforward proceeding. Criminal cases in which incarceration is a possible sentence present obvious problems: jailing a virtual image of a convicted defendant is hardly satisfactory.

C. Appellate Courts

Creation of a virtual appellate courtroom and trial of a virtual appeal present no significant problems, and we could do both today. A multi-point video conference would suffice. A multi-participant system enabling all parties to see each other at all times would require a more sophisticated electronic structure and a more expensive structure if the system required high-quality video, but this is possible too. Further, as is true of the Courtroom 21 Project's McGlothin Courtroom, such a virtual facility would also permit interchange of electronic legal authority, including briefs or components of briefs. In short, a virtual appellate courtroom is readily possible. As we create facilities in which one or more of the participants appear by video conferencing, we experiment across the world with the first limited versions of one.

D. Other Technology Problems

Most visitors to the Courtroom 21 Project ask questions about electronic security. Ordinarily this concern raises two different matters: (1) the risk of digital alteration or fabrication¹¹² and (2) the possibility of electronic eavesdropping, up to and including penetration and alteration of the court's electronic records. Theoretically, electronic eavesdropping is possible and, in some high-profile cases, the courts must consider it to be a meaningful threat, just as "hacking" is a constant risk to every network, even if the eavesdropper only intends it to be a prank. It seems unlikely that courts cannot deal with this threat by careful system design. Technologists know a great deal about physical and data security. Their knowledge and common sense should be sufficient—if implemented.

112. See discussion *supra* Part III.D.4.

E. Legal Problems

State constitutions, federal and state statutes, and court rules all potentially limit or prohibit virtual trials. However, legislatures can amend all of these. The most difficult source of applicable law to amend is, obviously, the United States Constitution. Accordingly, a cursory legal review should focus on that issue.

Any virtual trial will engender, at the very least, all of the current problems usually associated with high-technology courtrooms. If remote testimony by a prosecution witness currently implicates Sixth Amendment confrontation concerns, a trial in which all government testimony is to be electronic and remote would obviously pose a more demanding problem. However, at least two other constitutional problems are immediately apparent. Under the United States Constitution all trials are public trials, permitting closure only in narrow circumstances.¹¹³ How can a virtual trial be "public"? Presumably, the public receives access through its ability to view the proceeding electronically as the proceeding takes place. If one applies a limited original-intent, textual interpretation, this system may be inadequate, especially if not everyone has the means of obtaining easy and free electronic access. Critically, however, the traditional right to view a trial has never required the government to provide public transportation to the courthouse. Similarly, today's courthouses do not promise sufficient space for all interested attendees—first-come, first-served is usually the practice. Accordingly, if remote public access is sufficient under the United States Constitution, there is no current reason why all interested observers must have access.

At an equally fundamental level is the question of the meaning of the right to a jury trial. Section 2 of Article III of the Constitution provides that, "The Trial of all Crimes, except in Cases of Impeachment, shall be by Jury . . ."¹¹⁴ The Seventh Amendment specifies that "In Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved . . ."¹¹⁵ Because remote access would not require a "jury" either to hear the evidence while physically clustered together or, more importantly, to physically deliberate together, remote access is potentially very different psychologically from a traditional jury. Therefore, the Constitution may prevent virtual juries, absent waiver by the appropriate parties. Similarly, Due Process is sufficiently vague that a court could decide that it prohibits involuntary virtual proceedings.

113. See, e.g., *Press-Enterprise Co. v. Superior Court*, 464 U.S. 501, 505-10 (1984); *Richmond Newspapers, Inc. v. Virginia*, 448 U.S. 555, 564-73 (1980).

114. U.S. CONST. art. III, § 2.

115. U.S. CONST. amend. VII.

F. Human and Systemic Questions

Ultimately, all of the critical questions that grow out of adjudication are human ones. We can assume technological adequacy and sufficient funds for equipment purchase, maintenance, and operation, but we cannot assume sufficient human access, training, or acceptance. We can cope in a variety of ways with access and operation. Acceptance is another matter.

Courthouses have long been considered important, if not key, pieces of public architecture. Courthouses provide a sense of solidity. They often convey the role of law in American life. Federal courthouses, sometimes designed in past years to include post office facilities, often are the primary representatives of the national government. Courtrooms, the center of courthouses, embody the administration of justice.¹¹⁶ As William T. Gossett observed, "[i]f respect for the courts and for their judicial process is gone or steadily weakened, no law can save us as a society."¹¹⁷ Virtual courtrooms and virtual trials threaten that sense of place and solemnity. What might virtual courtroom justice mean to the people?

On the one hand, justice ought to be a real, rather than just a theoretical, right of every person. As the late Learned Hand observed, "If we are to keep our democracy, there must be one commandment: Thou shalt not ration justice."¹¹⁸ Our imperative must be to increase justice, not decrease it. If we can make the right to justice more meaningful for those who are faced with the demands of work, family, or limited mobility and cannot easily get to the courthouse¹¹⁹ for what is often a brief hearing, justice would be augmented. Yet, on the other hand, American respect for law and justice, diminished as it sometimes seems to be,¹²⁰ might well suffer if the public perceives that the process is not fair. Potential deficiencies include not only possible perceived deficiencies in the truth-finding process, for example, a doubt either that remote witnesses will tell the truth or that jurors can accurately evaluate the testimony of such a witness, but also the risk that the public will see the adjudicative system as no longer human-oriented. I assume that public compliance with legislated societal rules and acceptance of court verdicts require, at the very

116. "Courtrooms contain every symbol of authority that a set designer could imagine You wear a costume identifying you as, if not quite divine, someone special." JAMES B. SIMPSON, *WEBSTERS' II NEW RIVERSIDE DESK QUOTATIONS* 74 (1992) (quoting Judge Irving R. Kaufman, United States Court of Appeals for the Second Circuit).

117. DAVID S. SHRAGER & ELIZABETH FROST, *THE QUOTABLE LAWYER* 65 (1986) (quoting William T. Gossett, former President of the American Bar Association, in a speech to the Canadian Bar Association in Ottawa on Sept. 3, 1969).

118. *Id.* at 158 (quoting Learned Hand's address to the Legal Aid Society of New York on February 16, 1951).

119. Often, they must then wait a lengthy time for their turn.

120. *Cf.* Bob Van Voris, *Jurors Do Not Trust Civil Litigants*, *Period.*, NAT'L L.J., Nov. 2, 1998, at A24 ("More than three-quarters [of surveyed persons] agreed with the statement 'Whatever a judge said the law is, jurors should do what they believe is the right thing.'").

least, a general perception that justice is usually done by the courts.¹²¹ If the public perceives that justice is not done, whether because of result or process, that general consensus would fail. Even a cursory glance abroad makes it clear that the American adversary system is not the sole process that can command general societal acceptance as a fair adjudicative process. Too many other nations have broadly satisfied populations despite significant and sometimes radically different dispute resolution systems. Yet, the nature of what is acceptable in a legal system is clearly linked to national culture. The legal system in the United States is oriented around the concept of a trial in which the accuser or plaintiff presents evidence in open court in the presence of and subject to searching inquiry by the defense in a process kept reasonably fair by a neutral judge and resolved by human beings. The Anglo-American system has rejected adjudications conducted on the basis of dossiers, creating a hearsay rule that, however riddled with exceptions,¹²² creates an institutional preference for live, in-court testimony on all sides. Presently, it is unclear whether our population is prepared to interpret live, electronically conveyed testimony and related evidence as the human equivalent of in-court testimony. If it is not yet willing to do so, a true virtual trial will be viewed with great suspicion.

We ought not, however, be overly wedded to current courtroom assumptions. As Chief Justice Burger observed in a different context, "We should get away from the idea that a court is the only place in which to settle disputes. People with claims are likely people with pains. They want relief and results and they don't care whether it's in a courtroom with lawyers and judges, or somewhere else."¹²³

It is impossible to predict how this or any other nation will react to a virtual courtroom at a future time when telecommuting, virtual offices and libraries, and the like have become commonplace. Presumably, when adjudication uses the same methods employed in the day-to-day activities by most of the populace, those methods will not be viewed with suspicion. Until then, we must view virtual courtrooms with great caution. Of course, given the current rate of technological change, it may not be long before elements of the public find the lack of virtual courtrooms to be a visible sign of the law's innate and undesirable conservatism.

121. Elements of this perception are now threatened by suspicions of racially based unfairness. See, e.g., David E. Rovella, *Poll Elicits Fear of Rogue Jury*, NAT'L L.J., Nov. 2, 1998, at A25 ("Almost one-third of the potential jurors polled don't believe police testimony, with more than half of the blacks and Hispanics saying police usually don't tell the truth under oath. . . . As a whole, 43 percent [of those surveyed] said that the system treats minorities unfairly.").

122. FED. R. EVID. 801-07.

123. SHRAGER & FROST, *supra* note 117, at 66 (quoting Warren E. Burger's address to the American Bar Association meeting in New Orleans on August 27, 1978).

VII. SO, WHERE DOES THIS ROAD GO, AFTER ALL?

Even the most cursory review of the legal technologies now found in the new, integrated, high-technology courtrooms leads one to conclude that virtual courtrooms are not idle speculation. Insofar as the public and media are concerned, critical components of several different types of court proceedings are already virtual. The direct and cross-examination of the Argentine complainants via satellite-transmitted, two-way video in the *Harrell*¹²⁴ case was in many respects a virtual trial. That testimony was the critical and core prosecution evidence in the case. True, the rest of the trial participants were in the Florida courtroom, but the core was not there. Had the judge excluded the defendant from the courtroom for misbehavior, for example, and viewed both the Argentine testimony and the courtroom remotely, the virtual trial descriptor would become even more convincing.

As our high-technology courtrooms increasingly become technology hubs and the centers of massive electronic data interchange, we will get ever closer to true virtual courtrooms and virtual trials. It has long been a Courtroom 21 Project truism, however, that just because we can do something is not itself justification to actually do it. By eliminating travel, document transmission delay, and evidence presentation inefficiencies, virtual courtrooms could save a great deal of money and time for all of those involved in trial. They could make trials truly public if any member of the public could “log in” to a trial. By making public all of the case evidence, we could expect the media to improve its reporting.¹²⁵ These substantial improvements in operational efficiency and access are counterbalanced by the risk that the public will not accept trials as fair and accurate dispute resolution devices—if the public is not ready to accept virtual courtrooms.

The ongoing adoption of courtroom technology is such that we can expect massive systemic change over the next ten years. The Courtroom 21 Project and the Courtroom 21 Working Conference on Technology-Augmented Litigation believe that change is largely unstoppable. The sea change we are now undergoing will bring an increasing degree of “virtualism” to our courtrooms and trials. Whether we should in the short term endeavor to create virtual courtrooms for more than experimental purposes is another matter.

If the technologies that will permit true virtual courtrooms are already here in substance, the real question is one of total integrated use. As we continue down our legal information highway, the road will increasingly be affected by

124. *Harrell v. State*, 709 So. 2d 1364, 1367 (Fla. 1998), *cert. denied*, 119 S. Ct. 236 (1998).

125. Judge Donald Walter, United States District Judge in Shreveport, Louisiana, reported to William & Mary Law School’s Legal Technology Seminar in March 1998 that the use of a large wall-mounted screen to display all case evidence resulted in a report to him by a local journalist that she could understand what was really happening at trial for the first time.

technology. Remote appearances will increase,¹²⁶ and the use of electronic-based fact-finding will become commonplace. We will have the option of taking a number of early highway forks that would lead us directly and rapidly to virtual courtrooms. The main highway will likely take us to the same destination, but perhaps many years later. Which, if any, of the forks should we take?

If we are correct in our supposition that full virtual civil and criminal trials would threaten, in the short-term, the somewhat uneasy national consensus that most American trials are reasonably accurate, fair, and just, then we ought to use virtual courtrooms and trials for those areas in which the public would perceive an improvement in fairness and justice. We should welcome virtual proceedings that enhance the public's ability to participate meaningfully in the judicial system. The move to kiosk- and Internet-based legal information delivery and limited court services points the way. If traffic court and similar proceedings, including the vast number of administrative-benefit-application hearings, can be made easier for the public with a perceived improvement in access and fairness, then the public will accept virtual courtrooms and hearing rooms as valued improvements to the national adjudicative processes. Such courtrooms should begin as voluntary alternative means to current adjudication. As acceptance increases and the nation moves to even more technology use, we can expect greater use and dependence upon virtual courtrooms.

We are on the road to the virtual courtroom. Unless we take an intentional early exit elsewhere, our final destination is clear. The virtual courtroom is unlikely to replace our hallowed wood- or marble-paneled inner sanctums in the near future, but even those traditional places of law and judgment will see increasing amounts of virtual evidence and adjudication. However, we have the opportunity, as we travel, to build some high-technology side roads leading to specialized virtual hearing rooms and courtrooms. As we travel on the main highway, though, we travel with the near certain probability that for many types of cases and in many types of courts and tribunals our eventual destination will be the virtual courtroom.

126. Much of expert witness testimony may become remote in an effort to reduce litigation costs.