THE COMMUNICATIONS REVOLUTION: PORTABILITY, THE INTERNET AND THE PRACTICE OF LAW

Author:

RICHARD R. ORSINGER
ATTORNEY AT LAW
1616 Tower Life Building
San Antonio, Texas 78205
(210) 225-5567 (Telephone)
(210) 267-7777 (Telefax)
rrichard@txdirect.net
<http://www.txdirect/users/rrichard>

STATE BAR OF TEXAS
21st Annual Advanced Civil Trial Course
September 2-4, 1998 - Dallas, Texas
October 7-9, 1998 - Austin, Texas
November 4-6, 1998 - Houston, Texas

Table of Contents

COMMUNICATIONS REVOLUTION: PORTABILITY, THE INTERNET AND THE PRACTICE OF LAW©

by

Richard R. Orsinger
*Board Certified in Family Law
and Civil Appellate Law by the
Texas Board of Legal Specialization*

I. SCOPE OF ARTICLE This article covers the present and future impact of the Internet on the practice of law.

Throughout the Article there are citations to URL's (uniform resource locator), which are World Wide Web sites (files on other people's computers) that discuss the matter in more detail.

II. "YOU'D BETTER START SWIMMIN' OR YOU'LL SINK LIKE A STONE" Those of you who are not too young--and not too old--will remember this paean from an earlier generation. It is truer today than it was then. We are in the middle of a revolution. It appears that it will more profoundly affect our lives, and at a much faster rate, than the change from an agrarian to an industrial society affected our ancestors. To quote William Gates III, one of the creators of the personal computing revolution, who has become one of the wealthiest persons on earth, through his ability to foresee the importance of personal computers and to capitalize on that:

> When change is inevitable, you must spot it, embrace it and find ways to make it work for you.

It is not easy for lawyers to spot change, embrace it, and find ways to make it work for them. Lawyers are so busy baking the daily bread, there is just no time to spot change. Even when change is recognized, lawyers can't easily embrace it. Lawyers, once they learn a way of doing things, tend to continue doing things the same way, because it's a hell of a lot easier than learning to do things differently. Most lawyers won't embrace new ways of doing things-- they avoid them as long as possible. For years, the practice of law was modernized only when new lawyers, who had been trained in law school on new methods, went into law practice and rose over time to levels where they could implement the methods that were new 15 years before, when they graduated law school.

Purchasing new technology was also a financial problem, as well as a psychological one. New equipment was for years monstrously expensive. In larger law firms, going to a new technology required tens or even hundreds of thousands of dollars. In the early days of the personal computer, lawyers would buy non-standardized brands of equipment that soon became obsolete when the manufacturer went out of business, leaving no maintenance network or source for spare parts.

Sole-practitioners were probably more flexible, since the decision to upgrade equipment involved only 1, 2 or 3 computers. Also, the need to get more work done without adding a person to the payroll drove sole practitioners to learn to use the computer themselves.

However, staying up-to-date on new technology is now a major problem even for solos, because of the speed at which technology is changing. Because of the speed and magnitude of changes in business-related technology, you probably need to spend one out of every 20 hours (5%) of your work time on learning and implementing new technology, and changing your work habits and long-term plans to account for technological changes.

> **How much time do you regularly spend on spotting change, embracing it, and finding ways to make it work for you?**

The earlier part of this article is dedicated to painting with broad strokes the significance of the threshold at which we stand, as we look out toward the 21st century. As George Bush said, "it's the vision thing." Those who have already developed their vision of the future, or don't see value in learning the vision set out in this article, or who would rather wait and let the future arrive before worrying about it, may want to skip ahead to , where more concrete issues are discussed.

III. THE MOST IMPORTANT LAW FOR YOU TO UNDERSTAND. What is the most important law for you to understand--the law that will have more impact on your life than any other? The Texas Rules of Disciplinary Conduct? The Internal Revenue Code? The U.S. Constitution? None of these. The most important law for your future is MOORE'S LAW.

Moore's Law

The observation that the logic density of silicon integrated circuits has closely followed the curve (bits per square inch) = $2^{((t - 1962))}$ where t is time in

years; that is, the amount of information storable on a given amount of silicon has roughly doubled every year since the technology was invented. This relation, first uttered in 1964 by semiconductor engineer Gordon Moore (who co-founded Intel four years later) held until the late 1970s, at which point the doubling period slowed to 18 months.

<http://sunsite.nstu.nsk.su/jargon/m/MooresLaw.html> [8-21-98].

Huh, what?? Here it is again, stated more plainly:

Moore's Law

Gordon Moore (co-founder of Intel) predicted in 1965 that the transistor density of semiconductor chips would double roughly every 18 months.

<http://www.cs.washington.edu/people/faculty/lazowska/faculty.lecture/chips> [8-21-98].

Here is Intel's explanation of Moore's Law (and they are busy proving its validity, every day):

In 1965, Gordon Moore was preparing a speech and made a memorable observation. When he started to graph data about the growth in memory chip performance, he realized there was a striking trend. Each new chip contained roughly twice as much capacity as its predecessor, and each chip was released within 18-24 months of the previous chip. If this trend continued, he reasoned, computing power would rise exponentially over relatively brief periods of time.

Moore's observation, now known as Moore's Law, described a trend which has continued and is still remarkably accurate. It is the basis for many planners' performance forecasts. In 25 years, as Moore's Law predicted, the number of transistors on a chip has increased more than 2,300 times, from 2,300 on the 4004 in 1971 to 5.5 million on the Pentium® Pro processor.

<http://www.intel.com/intel/museum/25anniv/hof/mr.htm> [8-21-98]. Moore predicts his "law" will hold through 2007, and then doubling will occur every 3 years. *Wired* Magazine, p. 166 (May, 1997).

Imagine This!

The power of the computer rose by a factor of 1 million from 1970 to 1990. A factor of a million takes one year down to 30 seconds. That means that a 1990 computer could do in 30 seconds what a 1970 computer could do in one year. It is expected that, from 1990 to 2010, computing power will increase by another factor of a million. That means that a computer in 2010 will be able to do in 30 seconds what a 1970 computer would take a million years to do. That's progress!

IV. A WORD TO THE WISE . . . .   The following description of the impact of Moore's Law on our future is given by Ian Allen, a freelance writer, specializing in science and technology journalism. It's from his article, "Chip Power."

In terms of affordability and power, it's taken almost 50 years for computer hardware to develop to where it is today, but we'll double all we achieved in those 50 years in the next 18 months. In three years we're looking at a quadrupling. In six years we'll see home computers with 64 times the power of the fastest available today, and they'll probably cost less in real terms.

Geometrical growth is an extraordinary and powerful phenomenon, and although the mathematics of it are simple, human beings seem to have great difficulty in anticipating its implications.

Environmentalist Paul Erlich often likes to tell the salutory tale of a hypothetical species of intelligent microbes which lived in a test-tube. By failing to comprehend the implications of geometrical growth, they met a sudden end.

By contrast, geometric shrinking is the force chiefly driving the information revolution. In 1965, Gordon Moore observed that the number of components being squeezed onto a chip had doubled in every year since 1959. He predicted it would keep doing so until least 1975. Gordon Moore went on to found Intel, which has become one the world's leading computer chip-makers. His remark is referred to as "Moore's Law". While it's more a rule of thumb than a law in the scientific sense, it has proven to have been a remarkably salient observation.

Moore was wrong about the 1975 limit, but he was correct in identifying the phenomenon. Over the past 30 years the component count on chips has doubled

approximately every 18 months, and now there are no signs of the trend abating.

Etching circuits closer together on a micro-chip brings enormous benefits. Because electrons have less distance to travel, the chips run faster and require less power. Because they use less power, they create less heat. Because they create less heat, more transistors can be packed together without fear of melting the silicon. The more transistors, the more powerful the chip.

This relentless and geometrical shrinking of micro-circuits can't go forever. At the moment we expect another 10 years of the phenomenon before we approach the theoretical limits set by quantum physics, although there may be technological possibilities which allow it to be extended further.

Without speculating about yet-to-be invented technologies, it's clear that we are already living through a time of profound change. It's difficult to find an historical parallel.

People have been using the term "information revolution" for more than 20 years. Some now refer to it as the "information holocaust," pointing to the massive loss of jobs that has already resulted. But we've really only lived through the beginning. On the geometrical progression curve we've reached the point where every doubling represents a massive increase, yet we already know several more doublings are in store. The rate of change is about to accelerate dramatically.

It's scary. It's the stuff of a true revolution. Nobody can predict exactly where it will lead.

The one guarantee is that the impact of this technology will affect almost every aspect of the way we do things. No one is immune. As in all revolutions, there will be winners and losers. The balances of power within society will be challenged and rearranged. We live in very interesting times.

<http://www.abc.net.au/http/pipe/chipower.htm> [8-21-98].

V. "DON'T DRINK THAT! THAT'S MY COMPUTER!" The following article extends Moore's Law out into the future. It's entitled "Meet the Brains Behind a Revolution," and it was published in the Minneapolis/St. Paul Star Tribune On-Line:

Forget about the Pentium, Intel's top-of-the-line chip of today. Intel has already come out with its next generation chip, now named the P6, which should be available by the end of this year. The P6 can carry out as many as 300 million instructions per second, making it more than twice as fast as an average Pentium and 1,000 times faster than the Intel 8088 chip housed in the original IBM PC of 1982. Intel is already working on its next generation P7, due out in 1997 or 1998.

In the coming decade, the computing power housed on microprocessors can certainly be expected to increase a hundredfold. A consortium of companies developing interactive television expects to come out with a microprocessor by the end of this year that will break the billion-instructions-per-second barrier. If the dynamic of Moore's Law continues for another 25 years, we'll see about 16 doublings in the current power of our microprocessors.

However, increasing difficulties in the miniaturization process could eventually slow down the 18-month cycle. At some point it may simply cost too much to build the state-of-the-art chip factories needed to work in the tiny world of microns.

But scientists are already beginning to experiment on building computers out of biological material, like DNA, that potentially could eclipse the power of today's supercomputers. One expert estimates that someday a jug of the common genetic material might be able to crunch more numbers than all the computers in the world today.

<http://www.startribune.com/stonline/html/digage/chips.htm> [8-21-98].

Here's what Bill Gates said about the impact of Moore's Law on our future. He gave a speech, entitled "Technology: The Great Enabler - Its Influence On Society, Business And Communities," at the Economic Club of Detroit, on April 28, 1997, in which he said:

It was only when I was fifteen years old that I first read about the miracle of chip-making. This is the idea that chips are being made smaller and smaller, and so every two years it's possible to make the chip twice as powerful without any increase in price. That's exponential improvement, and it's just unheard of in other parts of business. Over a twenty-year period, the chip becomes a million times more powerful. So something that would have cost $10,000 costs one

cent. And that's exactly what's happened <u>during these last twenty years. Computers are a million times more powerful. We could say with great certainty that twenty years from now, computers will be again a million more times more powerful than they are today</u>.

So what are we going to do with this? How is it going to change the world? We're taking the computer and making it a tool for everyone. The computers of twenty years ago were simply for large companies. They kept track of bank accounts and travel reservations. But today, already the computer is cheap enough that on most desktops, knowledge workers have a personal computer, and increasingly in homes, over forty percent of American homes have a computer. But we really haven't seen anything yet. The kind of information we get, the ease of getting that information is nowhere near what it will be even in five years' time. <u>So the world is changing more rapidly now than ever before</u>. The previous advances that are comparable, the things like the printing press, telephone or television, each of those took an entire generation to become popular, and people had a lot of time to get used to it, to get ready for what it implied, and it was mostly the young people who grew up when the invention was out who had to adapt to it. <u>Here it's all compressed into a much shorter period of time</u>. And so the need for governments and companies and even individuals to think about what it means to them – what are the opportunities, what are the problems – these have become incredibly important.

[Emphasis added.] <http://www.microsoft.com/Bill Gates/speeches/industry&tech/DetroitEcon.htm> [5-3-97].

VI. PARLEZ-VOUS 1's AND O's? Communicating is one of humankind's principal activities. With over three thousand languages world wide, communicating with someone from another culture often hit a language barrier. To surmount this barrier, African tribes developed Swahili as a second language, independent from their native language. Mediterranean traders of the Middle Ages developed Lingua Franca, a language based upon Italian but using words from Spanish, French, Greek and Arabic. The age of European colonialism spread Spanish, Portugese, French and English across the Americas, Africa and Asia. Through this conquest and domination, many millions of people around the world were brought into the fold of a handful of languages. In 1887, a Polish doctor invented Esperanto, an artificial language for use in international communications, now spoken by some 8 million people.

Many other visionaries have developed simplified artificial languages which have not caught on. Today we finally have a truly new universal language. It consists of 1's and 0's.

Modern computers are electrical, and as such recognize only two states: on or off, power or no power, charge or no charge, one or zero. By translating numbers and letters and lines and colors and sounds into 1's and 0's, any communication can be put into digital form and transmitted in any fashion where two states (e.g., off and on) can be discerned. This involves the binary number system.

A binary number system, despite being limited to two numbers (1 and 0), is a very efficient way of expressing numbers. Using base 10 (decimal system), you can only count to 10 on both hands. Using a base 2 (binary system), on two hands you can count to 1,023. When you translate communication, into binary numbers, and send those 1's and 0's to a receiving machine, which translates those 1's and 0's back into communications, you have digital communication.

The communications networks in America are busily moving away from converting sounds (and fax images) into electrons which are sent through copper wires toward converting 1's and 0's into photons (laser light beams) which are sent through glass tubes (fiberoptic cable). 1's and 0's are also sent through the air, permitting mobility during communication. The speed
of fiberoptics and the mobility of radio communications are revolutionizing communications, and will ultimately revolutionize our lives. Our (electronic) communications will all be 1's and 0's. Once we standardize the translation of symbols into 1's and 0's and back out again, all people with access to electronic media will be able to communicate with each other, each using his/her own native language, with the communication equipment doing the translating. At that point we can say: "Tout le monde parle 1's and 0's."

VII. THE COMMUNICATION REVOLUTION We are in the midst of a "communication revolution." It appears that this communication revolution will take us into a new world, like the industrial revolution moved us from an agrarian world to a mechanized world. Bill Gates, co-founder of Microsoft Corp. (and one of the richest persons in the world), made the following comments about the communication revolution, at a speech on March 19, 1996, at the Chicago Public Library:

> [T]he PC has come a long way in the last 20 years. It was just over 20 years ago when I dropped out of school--and I'm not recommending that to anyone. It was Harvard University, one of the better places to

drop out of. And it was at that time that the first low-cost computers were becoming available. It was actually kind of a kit for $360, and you had to put it together. And even once you did that, it really didn't do much for you, but just the challenge of making it work and sort of trying to figure out what it could and couldn't do made it very popular.

Starting in 1981 with IBM's entry and being furthered by Apple products like the Macintosh, which brought a graphical appearance to the machine, and many, many improvements in the speed and storage capacity of the PC, has brought us to where we are today. Now, as we look into the future, the PC will continue to get better.

What is it that people are doing with the PC? Well, they're sitting down and expressing their ideas. They're using the word processor. They're using spreadsheets to study business plans or mathematical analysis. They're even using the computer now for information. When I was growing up, I loved reading The World Book Encyclopedia. Now, it was a little hard to go from topic to topic. It was always a little bit out of date. And so I'm very envious of young people today who, instead of using the print encyclopedia, have another choice, which is to use a CD, a compact disk, that has a lot more information on it, including music and animation. It has quizzes. So if you think you're smart about a topic, you can test out and see if you really are. And as you read about a subject, linking to related articles, simply clicking, and it takes you to another article. And, in fact, in the latest encyclopedia not only do you have the information on the disk, but you can reach out to the Internet and see what everybody's saying about a topic. So let's say it's about medicine. Then you'll see the most up-to-date research and be connected up to other people who are working in that area.

[T]he PC, as it continues to improve, will start to take on a completely new role, and we're really at the start of a new era, an era where we can think of the PC not just as a stand-alone computer, but as a link in an entire communications network. People say this is the Information Age. Well, why do they say that? I believe it's because, as this PC gets easier to use, as it gets cheaper, more and more connected together with great information that's fun to look at, it will become a -- it will foster a communications revolution that will be as important and as impactful as the communications revolutions of the past. That is, I'm comparing the PC

to the invention of the printing press, to the arrival of the telephone or the radio or even television.

[T]he personal computer is different in some ways than any of these. Because it's interactive, it is tailored to your individual interests. The topics that you want to learn about are the ones that you can reach out and find out about. Sitting and composing electronic mail and finding things -- it's a lot more active than sitting in front of the TV set. So I think, if we handle it right, the PC creates an incredible opportunity, an opportunity to take the curiosity and capabilities of the population as a whole that are so fantastic and make sure that those are not wasted. [Emphasis added.]

<http://www.microsoft.com/BillGates/speeches/indush/bg chicago.htm> [5-3-97].

VIII. COMPUTERS WILL BECOME THE PRE-EMINENT COMMUNICATION DEVICE We are accustomed to thinking of computers as permitting us to do what we ordinarily do, only faster. At the present time, many people look upon the computer as a glorified typewriter. Others view the computer as a glorified calculator. Others see it as a glorified set of paints and canvas. Others as a glorified filing cabinet. But computers not only permit us to do old things faster, but they permit us to do new things that we couldn't do at all before. In the future, computers will merge data storage, the production of text, sound and visual effects, and communication, into one device. Unlike today, where separate computer programs are needed for storage, production, and communication, in the future one software program will combine these features, and sending information by computer will be as simple as printing is today. The process of printing a document, then scanning it and faxing it, or mailing it, will be eliminated since they will be unnecessary and time-consuming steps.

IX. WE'RE ALL PUBLISHERS NOW. The World Wide Web does more than just give you access to information on millions of disk drives all over the world. Just as important is the fact that almost every person with an AOL, CompuServe, Prodigy or Internet account is now a publisher. What you publish, with little fanfare in the quiet of your office or your home, by putting it on the Internet, becomes available to millions of people. You now have the same opportunity to have your writings read as IBM or Microsoft or General Motors, or any Harvard professor. If you can just find people who are interesting to you, or who are interested in what you have to say, you can have world wide networks of friends. When citizens of one country are

talking directly to citizens of other countries, what happens to the middlemen (media, governments)?

Cyber-Futurist Nicholas Negroponte made the following statement in his 1995 book, "being digital":

> ....my optimism comes from the empowering nature of being digital. The access, the mobility, and the ability to effect change are what will make the future so different from the present. The information super-highway...will exist beyond people's wildest predictions.

X. GATES ON: THE INTERNET. At a speech on March 19, 1996, Bill Gates made the following comments about the future impact of the Internet:

> The Internet is an incredible thing. It's very hard to describe how fast this is happening and what it all can mean. You almost nowadays can't pick up a magazine without reading something about the Internet. When you watch TV now, sometimes they have strange strings up there that start "WWW dot this, dot that." Well, those are ways of finding things on the Internet.
>
> Really this will be the mainstream, and it's a gold rush because many companies are trying to position themselves to take leadership. So we have very high levels of investment, very intense competition. Lots and lots of innovation. Now, like any gold rush, the winners are unclear, and it'll take a long time before we really know who's doing the best thing. But <u>it's not too soon for individuals and institutions to start preparing themselves for the change that will take place, to start to get comfortable with these tools and what they can do for them</u>.
>
> I did put in one fairly technical slide here, because it relates to an important point about what is going to slow down the use of the Internet. The ultimate dream of the Internet is that you can connect up to any information or any other person anywhere in the world and send lots and lots of information, send a video image so they can see you and talk to you, let them watch a movie, exchange data and pictures very easily.
>
> Well, the only thing that really holds that back a little bit is the difficulty of the speed of the network. Today we call in using the normal phone lines, and that means the text comes up fairly quickly and pictures can take 5 to 10 seconds. But you really can't do video

at all. And so we need to convince communications companies -- phone companies and cable companies primarily -- to invest in better networks, networks with higher speed that will move up and mean that those images will come up immediately and we can start to send video and voice across that network and have very high-quality experiences. [Emphasis added.]

See <http://www.microsoft.com/BillGates/speeches/industry&tech/bgchicago.htm> [5-3-97]. Also see Bill Gates' interview of April 30, 1996, entitled "Where the Internet and Intranet Meet," given to *Internet* World magazine, at <http://www.microsoft.com/Billgates/speeches/internet/iw/iw.htm>. And see Bill Gates' speech of May 29, 1996, at the Harvard Conference on Internet Society, at <http://www.microsoft.com/bill gates /billgates_l/speeches/internet/harvard/hv.htm>.

XI. INTERNET VS. ON-LINE SERVICES. The relative merits of the Internet versus on-line information providers are explored in a Lexis-Nexis Web page ("news release") entitled "Internet Myths -- LEXIS-NEXIS Facts" at http://www.lexis-nexis.com/lncc/about/news release/nr12a.html. In this "news release" which is really an advertisement, Lexis-Nexis makes the following points.

"Internet Myths -- LEXIS-NEXIS Facts

"Media contact: Judi Schultz
(937)865-7466
judith.schultz@prod.lexis-nexis.com

"The incredible growth of the Internet and its impact on the ability of the average computer user to find and collect information from other computers connected to this network of networks cannot be overstated.

"According to SIMBA Information Inc., total consumer and business online subscribers increased 71 percent in 1995 or by more than 5 million users. While many people search the Web for recreational purposes, an increasing number of users are looking for critical, must-have business information.

"The popularity of the Internet, especially of the World Wide Web, has been a boon to LEXIS-NEXIS, the world leader in premier online services. Many more millions of computer users are expected to discover a need for electronic information in the next few years because of their exposure to the Web. While information on the Web today

is mostly free, it has sparked demand for online information from traditional business-to- business online services such as LEXIS-NEXIS.

"To compare the LEXIS®-NEXIS® service and the Web, it is helpful to view the two in terms of content, search engine performance and searching tools.

"Content

"Beginning with the size of its data warehouse, the LEXIS®-NEXIS® service is distinguished from all other electronic information sources, including the World Wide Web, by the scope and quality of its online content. On average, LEXIS-NEXIS adds 14 million documents each week to the nearly one billion documents online. In comparison, the World Wide Web adds more than 300,000 documents each week to its current estimated total of 39 million documents. In 1995, the amount of LEXIS-NEXIS online information grew nearly 40 percent, or the equivalent of about six WWWs.

"The World Wide Web offers informational gold amidst the dross of vanity home pages and corporate advertisements. The LEXIS-NEXIS service contains only official documents from public sources or licensed material from authoritative publishers and information providers. For 25 years, LEXIS-NEXIS has been an expert in creating systems that insure security, data integrity, billing and near 100 percent up-time, attributes that continue to elude the Internet.

"Search Engine

"Media reports about recent developments in search engines or "spiders" like Alta Vista and Lycos to locate and index Web pages have turned a spotlight on what used to be a very arcane subject, online search engines.

"Without a doubt, the LEXIS-NEXIS search engine is one of the fastest in the world searching one of the largest commercial databases in existence. More than 90 million searches were submitted to LEXIS-NEXIS in 1995, searching more than one terabyte of information, yet most answer sets were returned in around eight seconds.

"The LEXIS-NEXIS search engine uses Boolean search commands, a collection of mathematical algorithms that stand today as the best, most comprehensive method for in-depth research. It is the search method of choice for librarians, attorneys and professional information brokers who can't afford to overlook any document relevant to a particular search request.

"Because LEXIS-NEXIS is a full-text information retrieval service, every word is indexed for pinpoint location of every searchable term. The LEXIS-NEXIS index is always up to date, and the database is always 100 percent searchable. Even the best of Web spiders typically locate and index less than 95 percent of all web sites and only search periodically, such as once a week or less often.

"Searching tools

"If electronic information is akin to a field of hay, then the current generation of Internet search engines are able to gather it into haystacks. LEXIS-NEXIS on the other hand provides its customers with tools to find that proverbial needle in the haystack.

"LEXIS-NEXIS has refined its online system to make searching easier and better. For the infrequent or inexperienced user uncomfortable with the rules of Boolean searching, it has developed other search methods such as natural language and new graphical user interfaces.

"For precision searching online, the company developed such functions as MODIFY and FOCUS. Using MODIFY, the user can add words to the search to narrow or expand the scope of the search results, while FOCUS allows the user to spotlight words within the documents retrieved that were not part of the original search.

"For easier searching, LEXIS-NEXIS in 1993 introduced the FREESTYLE™ feature, which allows a user to write a research question in conversational language that may deal with conceptual or complex issues without the need for Boolean connectors and search logic. Using an evolving technology called associative retrieval, the FREESTYLE answer set is ranked by the relevance of the terms within the documents to the search request.

"For additional precision online, LEXIS-NEXIS provides a thesaurus of related concepts, which aids the user in thinking of additional search terms. This feature, available in both FREESTYLE and Boolean search formulation, suggests alternative terms that appear close to the one used by the searcher. RANK is another feature that allows the user to sort the results according to relevance, rather than chronological order.

"Another refinement for precision searching is the FREESTYLE Search Conversion option. Rather than reformulating a Boolean search request that resulted in zero documents or in 1,000 or more documents, the LEXIS-NEXIS user can convert the search to a

FREESTYLE search for a guaranteed, manageable answer set.

"LEXIS-NEXIS also has developed intuitive AnswerPak™ software interfaces for a new breed of information seeker, searchers typically who are the end-user of the information retrieved, such as marketers, journalists, financial analysts and sales professionals. AnswerPak products use a graphical interface to guide the user through search formulation, source selection and document delivery options.

"Moving away from online delivery of information, LEXIS-NEXIS has been an industry leader in developing a group of current awareness or news alert products. These products employ searches developed by expert LEXIS-NEXIS searchers, or provide the user with a forms-based interface to create an ongoing search of their own, for the purpose of tracking industry, company or client news. The user, who need not subscribe to the LEXIS-NEXIS service, receives the results daily or more frequently via an enterprise e-mail or groupware system. Another variation of these products allows the user, via e-mail, to launch an ad-hoc search of the LEXIS-NEXIS database on any topic. These same products soon will be available via Internet browser." [End of advertisement]

XII. ELIMINATING THE NEED FOR CONCURRENCY WILL CHANGE OUR VERY LIVES.
Methods of communication and information transmission that exist today, and that are being developed, will liberate people from the burden of having to coincide in space and time. When concurrency in space and time is no longer required, people will be free to accomplish tasks when and where they want. Precious time will no longer be lost just trying to coincide with other people in space or in time, as a prelude to actually doing something. This freedom from concurrency will change our work habits, and our private lives, both at the individual level and at the societal level. We should identify the process of liberation from concurrency, and exploit the advantages.

The need for concurrency in *space* is being eliminated in part by the digitizing of information traditionally stored on paper. Digitizing means converting information (*any* kind of information) to 1's and 0's. Once information is digitized, it can be read and processed by computers, and you no longer have to go where the data is located to see it. It can be transmitted to anyone, anywhere, who is linked by wire or by radio to the telephone system. The need for concurrency in *space* is also being eliminated by technology that permits both visual and sound information to be transmitted instantaneously across telephone lines and through radio waves. People will be able to project a "telepresence," which will be good enough in many situations to substitute for an actual physical presence. This will permit "virtual meetings" in which people can look at each other and talk to each other as if they are in each other's presence, but in reality everyone is just interacting with an electro-mechanical reconstruction of what the other person looks like and says. The need for concurrency in *time* is being eliminated by the acceptance of voice-mail and e-mail that permit people in different places and at different times to store information when it is convenient to store it, to be seen or heard by others when it is convenient to receive it, and "groupware" that permits many people from different places to collaborate on one project at different times.

XIII. SOME IMPORTANT ASPECTS OF COMMUNICATING.

A. Communicating Across Distance. For most of human history, in order to communicate instantaneously the sender and the receiver had to be in the same location. Persons who wished to communicate over a distance had to accept a delay between sending and receiving, and this delay impaired or destroyed the interactive aspect of communicating. For example, a messenger could carry a communication across distance, but only at the expense of time passing. It took the same amount of time to receive the reply back.

Humans have long tried to transmit information faster than a person could carry it. Reportedly word of the fall of Troy was transmitted quickly from Asia to Greece by a series of fire signal towers. The Mongols used carrier pigeons to transmit information across history's largest empire. American Indians used smoke signals to transmit information. Africans used drum signals to pass messages. Flags were used to send signals between ships at sea.

At the time our country was founded, communication across distances was available to the general public through the postal system. But the postal system was limited to the speed of a ship, a horse, and delivery-man on foot. As a practical matter, most of people's activities were based on immediate communications in their immediate vicinity.

Electricity transformed communications, by greatly increasing the speed of sending information over a distance. Some methods of electrical transmission of information have been for public communication, and some for private. With the successive development of the telegraph (public),

the radio (public), the telephone (private), the television (public), and the internet (private and public), people could communicate over distances without the delay that beset their ancestors.

We are now very close to the maximum speed for transmitting sound messages. With television, the public transmission of visual images is instantaneous. We are now on the verge of instantaneous private video communications ("telepresence"). The electronic equivalent to face-to-face meetings is almost a reality for the average person, from his or her office or home, or even in a vehicle. When instantaneous voice and visual communications become available for private communication, technology will have eliminated the time lapse for communication over a distance. Travelling to a meeting will be a conscious choice, not a necessity. The great inefficiency of travel time will evaporate, and that much more time will be added to the work day or the personal day. The ramifications of having that added time will be significant.

The limitation on communications now is not speed but bandwidth--the amount of information that can be transmitted at one time (64,000 bits per second is needed for voice, 45 million bps for video, but after compression video needs only 1.2 million bps). While digital telephone technology has increased bandwidth, the true revolution will occur when the information superhighway (National Information Infrastructure) is connected. The information superhighway, consisting of fiberoptic cable, will be able to transfer digital information at the rate of one billion bits per second. At this rate, fiberoptic cable would be a minimum of 500 times faster than the coaxial cable used by cable television companies. In 1993, AT&T researchers succeeded in simultaneously sending four different wavelength laser beams through fiberoptic cable, raising transmission capacity to 6.8 billion bits per second. Unlimited amounts of information can be transferred instantly, in this fashion.

Before long, the bottleneck in communication will be entirely human--the age-old problem of people's reluctance to take advantage of new ways of doing things.

B. Synchronous vs. Asynchronous Communication. Another aspect of communication involves the simultaneous nature of the communication. "Synchronous" communication occurs when the receiver is receiving information at the same time that the sender is sending it. "Asynchronous" communication occurs when the message is sent at one time but received at another. Some comparisons:

1. Examples

Synchronous	Asynchronous
Group ritual	Cave painting
Conversation	Letter/fax/e-mail
Speech/Lecture	Newspaper/books
Concerts	Tapes, CD's
Plays	Movies/Video tape
Talking on the phone	Voice mail message
Chat room on AOL Internet Relay Chat	Reading pages on WWW
Dictating to a secretary	Using a dictating machine
Live trial testimony	Deposition testimony
Live trial testimony	Reviewing statement of facts
Appellate oral argument	Appellate brief

2. Eliminates "Telephone Tag." Attempting to connect with another person to have synchronous communication can be a huge time-waster--a big delay factor. People play "telephone tag." Entire days are lost while parties attempt to synchronize their communication. Asynchronous communication can reduce this time wasted in attempting to synchronize communication. The sender sends when (s)he wants; the receiver receives when (s)he wants. The communication is often completed much sooner when the parties are willing to accept asynchronous communications.

3. E-Mail. A letter is a medium for asynchronous communication. Traditionally 1 to 3 days is lost in sending a letter. However, telefaxing a letter permits asynchronous communication with no transmission delay. But, the process of faxing is slow and labor intensive. Phone calls may be faster than mailed letters but faxed letters may be faster than phone calls, because of asynchronousity. E-mail is easier for asynchronous communication because e-mail has very little set-up time and very little production time. By dispensing with the formalities of a letter in favor of something more akin to a memo, a communication can be

sent by e-mail with a minimum of trouble--*by those who can type*. E-mail is especially effective where the message needs to be broadcast to a large number of recipients. If the recipients are all on the e-mail system, simultaneous broadcast of one e-mail message to many recipients is effortless and instantaneous (from the sender's point-of-view), by use of "mailing lists" that permit broadcast of an e-mail message to a group of recipients, all at one time. It is not necessary in such a situation to send the e-mail message to each recipient, one-by-one, as would be the case with a letter. Services exist that can "broadcast" a fax to multiple recipients. However, the cost is 35 cents/page. An e-mail message costs 1/10th the cost of a fax. E-mail will supplant fax broadcast, once everyone has an e-mail address.

4. <u>Voice Mail.</u> The increasing acceptance of voice mail has made asynchronous telephone communications more prevalent. When a caller leaves a message with a receptionist or secretary, the process of leaving a content-related message is slow and prone to error. With voice mail, the caller can easily leave an extended message without fear that the message will be changed in transmission. In many instances, accepting this asynchronous alternative to getting someone on the line at the same time is a great timesaver.

C. Unilateral vs. Interactive Communication; "Inter-creativity." One of the big advantages of synchronous communication is the possibility of interactive communication. This is why historically face-to-face meetings have been essential to tasks requiring the cooperation of several people. People can interact, and respond to one-another's comments, look at the same chalk board or flip chart, etc. Satellite conversations that are ancillary to the main discussion can occur among people in the room.

Technology now exists that will permit people to interact in a "meeting" that occurs on-line. The faces of all participants in the on-line discussion are presented as "windows" on your computer screen, and you can hear every person's comments through the speakers attached to your computer, even when they are talking simultaneously. The software can project documents, and even show "edits" to the documents created by using a John-Madden-style computerized pen which creates electronic "marks" on the document.

Normally, leaving messages or sending letters or e-mail is a unilateral communication, except in the most delayed fashion. However, if members of a group accept the idea of checking a particular location in "cyberspace," and reading messages that other people have left, and leaving their own responses, then a form of interactivity occurs, albeit stretched a little bit over time. The unilateral communications (each e-mail message) take on an interactive nature as time passes.

New collaborative software is being developed that will permit persons in different places to work together on the creation of a single document, each accessing the document at different times. *See Structured Cooperative Authoring on the World Wide Web*, <http://www.w3j.com/1/quint.091/paper/091.html> [8-21-98]

Tim Berners-Lee, the inventor of the World Wide Web, in an interview in THE WORLD WIDE WEB JOURNAL (Summer 1996), made the following comments about interactive projects on the World Wide Web:

Q. From the start of the Web, you've been promoting interactivity as the ideal. Do you feel that we're any closer to that? If not, what's it going to take to make the Web more interactive, more collaborative?

[T. B-L] The word "interactive" is terrible in a way, because people mean different things by it. To really be able to work at a distance, to use a knowledge space, you need all of it. So when some people say "interactive," they mean taking real-time audio and video and integrating it with the Web so you can create a meeting document and talk to people in it. Another form of interactivity is to be able to make a comment on somebody's paper, to put a yellow sticky on it and say, "This is really important," with a link to why it is. Yet the real-time video problems, and the annotation problems are totally different, and they're both big problems.

Q. How do you sort them out?

[T. B-L] Well, I've recently started using the term "intercreativity" instead of interactivity. By this I mean something like building things together, which is more than filling out a form and hitting "submit." Imagine, for example, a heap of objects--a compass, a magnet, and some iron filings. You come across them in a 3-D virtual world, and you can use them to learn something about magnetic fields. Suppose you can take these magnets and their properties to another virtual world and with them create a little tower of magnets and discuss it with your friends. Suppose you can build with other people within the virtual space.

That will be much more satisfying and more productive than any of the current forms of interactivity. Yet that sort of thing will also need a lot of engineering; you will have to roll in a lot of things.

Q. So how would you define "intercreativity" succinctly?

[T. B-L] Building together, being creative together.

Q. Are we getting any closer to that ideal?

[T. B-L] As usual, interface technologies are always further ahead on the viewing than on the creation. Intercreativity happens when you are able to build, make something, express yourself while you are in the same mode as when you are reading, absorbing, surfing. In other words there's no difference. When you have something that you need to express, the threshold is so low that you can move it out into the communal space. . . .

<http://www.w3j.com/3/s1.interview.html> [8-21-98]

XIV. DEMATERIALIZING THE WORKPLACE.
Right now we "go to work." To do work, we "go to the office," where our tools are located. Where our files are. Where we can talk to our co-workers. We go to the office so we can be reached by telephone, letter and telefax.

In the future, this will no longer be the case. We are going to have portable offices, that permit us to work wherever we might be. Once information that is now stored on paper is routinely kept in digital form, you will not need to be "near" your files, or "near" your library. You can carry them with you or summon them to you. Once you have a personal communication number, you will not have to go to a particular place (the office) to receive faxes and telephone calls. Your laptop computer with wireless communication links will be your filing cabinet, your library, your telephone, your secretary. Your videolink (using a camera built into your laptop) to others will permit you to have a "virtual" face-to-face meeting with anyone, at anywhere, from anywhere.

See "Welcome to the Virtual Office," part of a speech Bill Gates gave on Nov. 14, 1995: ("Today, the common idea of an office is a place where people go to see each other and to use tools such as PCs, fax machines, and photocopiers to complete tasks individually and in teams. However, in the future, mobile computing and wireless communication will

create a different model of how people work together.") See < h t t p : / / w w w . m i c r o s o ft.com/billgates/billgates_l/speeches/industry/v_office. htm>.

Law firms will restructure to permit telecommuting in order to reduce overhead and to comply with environmental pressures to reduce vehicular traffic congestion and automobile emissions. Telecommuting will also permit working parents to provide more of their own child care and save commuting time.   Firms that arrange for telecommuting will have an advantage in hiring lawyers (especially women who have a second job to start when they "get home from work") compared to those that don't.

Commute time will disappear, and will be replaced by additional productive or leisure time.

Bill Gates spoke on the future of mobile computing at the keynote speech at the Comdex Conference in the Nov. 14, 1994:

Mobile computing will keep you in touch.

Pagers and cellular phones now give us a greater ability to stay in touch with the world when we're on the move. In the future, wireless communication with computers of all kinds could enable us to send and receive many kinds of information from virtually any place and at any time.

Cars and airplanes will feature built-in computer-- based devices. You might also find them in public places such as shopping malls. If you're a salesperson, you'll be able to review a customer profile without taking your hands off the steering wheel or hold a video conference from a public phone booth.

You'll also have wireless devices throughout your home. Put away your paper money and coins. In the future you will make purchases with electronic currency (tomorrow's cash) or credit, beamed from your Wallet PC to your local merchant's register-or to someone else's Wallet PC. Your account balance and credit line could be updated instantly or out-of- pocket "cash" expenditures could be tracked.

Stay connected. Receive wireless messages--text or voice--so you're always accessible and aware, and you get the news as it happens.

Forget about paper tickets. Pay for or charge "tickets" for sports events, travel, or entertainment with your

Wallet PC, and the transaction would be recorded without paper. When you arrive at the event, your Wallet PC will authenticate your purchase and act as your ticket stub.

Mobile computing will change the way we think about our offices, our homes, and our world. It will truly change the way we live.

The most personal of all mobile computers. Imagine a truly lightweight, hand-held, pocket-sized computing device. Imagine you can choose one to suit your taste and needs. Everybody has one. You take it everywhere. It's indispensable, much like your keys, wallet, and credit cards are today. That's the Wallet PC. With it, you will open doors, pay for lunch, receive messages, and identify yourself, all electronically. Through it, you may allow many other devices to interact with you on a personalized basis.

Get directions. Your Wallet PC would link to location information. So, for example, in a shopping mall, you can have your Wallet PC locate a store and give you directions. It may even be connected to a satellite location (GPS) service. Perhaps it will also give you verbal cues when you're driving.

Be on time. The Wallet PC would keep track of your schedule, so you can easily check what's next and see how much time you have to get there. And any changes you make would be updated wirelessly.

Show off your family. You'd never be without your family photos with the Wallet PC. You could even store a whole slide show if you like.

<http://www.microsoft.com/BillGates/speeches/industry&tech/mobile.htm>.

XV. SOME THOUGHTS ABOUT THE FUTURE, AND ITS IMPACT ON THE PRESENT.

A. What's Past is Prelude--No Longer. If you are the kind of person who likes to plan, you use the past to project the future to guide you in the present. This was a very valid approach when the future was little different from the past. For much of human history, nothing changed for thousands of years. Then nothing changed for hundreds of years. More recently, nothing changed for decades. Not so now. Now things don't change only for years. The rate at which things are changing now is so fast that the past is no reliable indication of the future. The life patterns that worked for

our grandparents and parents work less for ourselves, not very well for our children, and probably very little for our grandchildren.

With the rate of change being what it is, we are going to have to develop a different approach to projecting the future, if our expectations of the future are to guide us well in the present. And the most frightening thing is the fact that not only are things changing more quickly than they used to, but the rate at which things are changing is increasing.

B. Change in the Rate of Change. Mechanics (the science of motion) recognizes the difference between speed (rate of change of distance over time) and acceleration (change in the rate of change). You can drive somewhere at 30 m.p.h., or you can drive somewhere at 60 m.p.h. After you do it for a while you get adjusted to the speed. But what if you are accelerating? How do you adjust to a particular speed when the speed is constantly increasing? How much more difficult is it to adjust when you are accelerating at an accelerating rate? This is happening to our life patterns.

C. Predictions About the Future. The only thing certain about the future is that the future is uncertain. Some of the most convincing prognosticators are not futurists, but science fiction writers. However, George Orwell's 1984 came and went, with no monolithic dictatorial world order. Arthur C. Clarke's manned expedition to Jupiter's moons will not lift off by 2001. [By the way, 2001, not 2000, is the first year of the new century and new millennium.] Besides, we can count on the fact that we will live out our life patterns in predictable ways, regardless of the technology that surrounds us. Still, changes in technology will have a significant impact on our lives. Bearing this in mind, the Author makes the following predictions about the impact of technology on our professional lives in the future.

Within 3 Years:

• You will telecommute to work at least one out of 15 workdays.

• You will "attend" some meetings by teleconference, instead of traveling to the meeting. Even now, Southwestern Bell Telephone Company provides a video-conferencing service, called Multipoint Video Service (MVS), where three or more locations can participate in a video-conference at the same time. "The bridging or connection of the video calls from multiple sites is accomplished at the Southwestern

Bell central office by means of a multipoint control unit (MCU). When the various sites call the designated conference telephone numbers at the predetermined date and time, they connect to a port on the MCU (i.e. bridge). The MCU, a box-like unit, allows all the sites to see and hear each other as part of one big video call." See http://www.sbc.com/swbell/shortsub/mvs_desc.html.

- You will dictate directly to your computer, which will type documents for you. (Actually, you can do this now.) Sound will be a prominent feature of using computers. Your computer will give you verbal as well as visual cues. (Remember the HAL 9000 computer in the movie *2001: A Space Odyssey*--by the way, try incrementing each letter in HAL by one letter of the alphabet.) "The primary channel of communication between computers and users during the next millennium will be speech--people talking to computers and computers talking back." Nicholas Negraponte, "Message 38," 4.08 *WIRED* Magazine (August, 1996).

- The computer and the telephone will merge into one instrument. Through your computer, you will be able to speak with anyone anywhere in the world on the Internet, and your computer will translate the other person's speech into your own language. There will be no long distance charge. Most on-line users will know how to type and read American English, which will become the lingua franca of the Internet. Even now, Southwestern Bell Telephone Company is selling software, called *PC Manager*, Windows-based, IBM-compatible computer telephony integration (CTI) software which enables you to manage your telephone calls more efficiently by allowing you to graphically recreate your telephone on a computer screen. With PC Phone Manager, you can perform almost any phone function by pointing and clicking with your mouse. *PC Manager* is available in Spanish and English and is priced at $89.95 + $6.95 shipping and handling. See http://www.sbc.com/swbell/pcphone/pcphone0.html.

- Some trial courts will be using software that instantly converts courtroom voices into text automatically.

- You will file some of your statements of facts in the appellate court on searchable CD-ROM instead of paper.

- Some appellate advocates will move the court, and will be permitted, to give a video-based audio-visual presentation on a monitor in the courtroom in lieu of oral argument.

- You will journey out into the Internet at least five times a week. Preparing a Web page will be as simple as typing a wordprocessing document, and you will have your own page on the World Wide Web.

- On-line electronic law journals will begin to proliferate. [The Appellate Practice & Advocacy Section has an electronic Section Report at http://www.txdirect.net/users/rrichard/appellat.htm.] E-journals will specialize in narrow areas. "The next decade could witness the end of the law review as we know it." Hibbitts, Bernard J., *Last Writes? Re-Assessing the Law Review in the Age of Cyberspace*, http://www.law.pitt.edu/hibbitts/last.htm.

Within 10 Years:

- With the information superhighway in place, through either co-axial cable, fiberoptic cable or satellites, you will have 500 television channels. You can order the programs or movies you want to see, at the time you want to see them. With a cable modem your computer can receive massive amounts of data in seconds.

- There will be a blurred distinction between your hard disk drive, your CD-ROM drive, other drives on your network, and other drives available through the Internet. Through the Internet you will be linked to millions of hard drives all over the world. When you "retrieve" a file, your software will seamlessly do what it takes to get it to your screen, even if the file is in a computer in Bangladesh.

- The World Wide Web will have many "virtual reality" sites, where you will be able to float or fly, touch and move objects, etc. Some consumers will "walk" down the aisles of virtual grocery stores, making purchases which are charged and then delivered to the home.

- You will access the Internet continuously, through a software program, called an "agent." Your agent will monitor the Internet for information you are interested in, and will dutifully report that information back to you, without your having to "go out onto the Net" manually. Your computer screen will be constantly transmitting information from the Internet.

- E-mail will be the dominant interpersonal communication medium, exceeding voice communications. (From "being digital," by Nicholas Negroponte, founding director of MIT Media Lab, http://nicholas.www.media.mit.edu/ people/nicholas/).

- Industries will be changing so rapidly that many high school seniors will get jobs after college that haven't yet been invented when they graduate from high school.

- Texas statutes will be almost fully codified, and no one publisher will have a "corner" on publishing current statutes.

- You will telecommute to work at least one day a week. You will sometimes arrive late or leave early from work and make up time from your home, using remote computer access from home to office.

- Witnesses will testify "live" in trial from remote locations by videolink. Some Texas trial courts will digitally record videoimages of testimony and will forward a statement of facts to the appellate court on CD-ROM with written transcription correlated to videotrack. This will embolden courts of appeals to be more activist in reversing for factual insufficiency of the evidence.

- Some courts will accept multi-media briefs, limited by length of run-time rather than pages. The briefs will be on CD's, will include sounds and moving graphics, and will permit "stop-action" with hypertext links built into the frozen frame, so court personnel can check record references. Clips of actual testimony will be part of the multi-media presentation. A good appellate advocate will have or will develop skills in shooting and editing movies.

- Big law firms will largely be supplanted by smaller specialty firms and sole practitioners who affiliate with each other on a case-by-case basis. Lead lawyers will assemble teams for large transactions or particular lawsuits. Such affiliations will be assisted by collaborative software that permits many people in different places to work on the same project, and by electronic interlinking of the different firms that are working on a joint project.

- You will have your own personal communication number that people can "call" to communicate with you. Communications systems will be able to locate you anywhere in the world. People will call a "person," and not a "place." You will use voice mail and not a secretary to screen calls.

- Videophones will have widespread use in business. However, the videophone will really be a computer, not a telephone. You will have a small videocamera on top of your computer monitor and speaker on each side of it, which you will use for video conferences.

- Since all appellate opinions are available in electronic form, service companies using automated computer programs will offer you statistical "profiles" of appellate courts and appellate judges on those courts. You will know what percent of summary judgments a particular justice has voted to uphold or overturn. Services will also offer you sample language from the justices' opinions to use in your brief.

- Your computer's user interface will be a "persona" (life-like computer character) of your choosing. [Microsoft is now working on a parrot, named *Peedy*]. See http://www.research.micro soft.com/research/ui/persona/home.htm. You will speak to your computer and your computer will speak to you. You will relate to your computer as a person, while knowing that it is a machine. Tests show that gender biases and gender expectations carry over to the computer, depending on whether the computer persona is male or female.

- "Virtual universities" will offer courses through videolink and the Internet. People will take college courses from the world's most popular professors, without leaving their office or home. Attendance at expensive "bricks and mortar" universities with their budgets bloated by professors who cannot be terminated due to the tenure system, will drop, driving tuition up, which will cause attendance to drop even more. Private universities will merge or specialize to survive.

- You will give oral argument to appellate courts in other towns by videolink from your home town. [The El Paso Court of Appeals has this capability already.]

- The U.S. Government and other private parties will have access to all internet communications. Privacy will be assured, not by denying access to the communications medium, but by encrypting communications so that they cannot be read by anyone but the recipient.

- The primacy of books will be challenged by a hand-held, lightweight, portable, radio-linked sheet of plastic which will respond to voice and touch commands and which will display the image of a book page, movie, etc. Wall-sized projection screens will display computer-transmitted information. You will be able to get eyeglasses that project computer-transmitted information before your very eyes. You will not have to "sit at the computer" in order to see the computer's visual output.

D. An Interview With Bill Gates, the Richest Man in America. The following excerpts are from an interview with Bill Gates, entitled "Success Lies in Thinking Long-Term" (7/18/95).

My success in business has largely been the result of my ability to focus on long-term goals and ignore short-term distractions. Taking a long- term view doesn't require brilliance but it does require dedication.

*   *   *

A decade ago I foresaw software on compact discs, and Microsoft got way out in front on that one. The market took years longer to develop than I expected, but we kept investing for the long term. This strategy has proven very valuable.

Much more recently I've concluded that the wild success of the Internet signals a massive structural change in the computing and communications industries.

I have long expected computer networks to achieve historic importance, but it has only been in recent months that I've come to expect the Internet to become mainstream.

My thinking changed when I realized that communications costs are coming down so astonishingly fast that the Internet can, in the foreseeable future, evolve into a network able to serve hundreds of millions of people. Technical obstacles to the Internet's success are falling by the wayside.

This sea change is prompting us to critically reevaluate our plans - short-term and long-term.

One of our highest priorities has become building extensive Internet support into Windows, for example.

And the Microsoft Network, like other commercial on-line services such as CompuServe and Prodigy, is evolving to become a part of the Internet rather than strongly distinct from it.

I doubt that even a year or two ago any of the on-line services foresaw the Internet assuming an overarching role. But now that the sea change is becoming apparent, services are rushing to embrace it.

This is exactly the right thing to do. When change is inevitable, you must spot it, embrace it and find ways to make it work for you. [Emphasis added.]

Formerly at <http://193.6.96.40/egyeb/nemkorm/gates/0718.htm> [link now dead].

XVI.   INFORMATION OVERLOAD   Now that everyone can publish electronically, and as bandwith continues to increase, there will be more and more information available until ***WHAM!*** we have information overload. Before, we had trouble getting the information we wanted because it wasn't cheap and readily available. In the future, we will have trouble getting the information we want because too much information is too cheap and too readily available.

A. Filtering Services   To contain information overload, services will arise (some already exist) that will monitor the information markets and group selected information into specialized electronic newsletters or databases. We will pay these services for access to their selected information.

B. Agents Individuals will have software programs called "agents," which will prowl the Internet collecting information in specified areas. The agent can provide a mix of information types (e.g., stock markets, weather, news from Dallas, baseball, and Chevrolet Corvettes).

C. Boolean Searching Brute force searching of raw material using key words and Boolean connectors will continue to be a tool for information seekers willing to slog through hundreds or even thousands of "hits." Xerox PARC (Palo Alto Research Center) is developing new search paradigms that may work more effectively. (Xerox PARC invented the graphical user interface, the laser printer, the mouse, local area networking, bit mapping, object-oriented programming languages, and other mainstays of current computer use). See http://www.parc.xerox.com.

D. Serendipity "Serendipity" describes the role of luck or chance in learning or research. Many significant scientific discoveries have been fortuitous, including for example the discovery of the salutary effects of penicillin, which has saved millions of lives. Serendipity was the principle behind putting a sick person at the cross-roads near a medieval town, to see if passing travelers had heard of a cure. Serendipity is the reason you browse through a "good" bookstore looking for interesting books that you didn't know were there before you went. There are vast opportunities for serendipitous learning on the World Wide Web.

E. Self-Education Anyone familiar with the story of Abraham Lincoln's rise from uneducated poverty to the pinnacle of American politics and American history will be thrilled at the prospects of the World Wide Web for self-education. A creative person, a thinker, someone with a thirst for knowledge and understanding, who can get to a computer with a modem, will have direct access to the full measure of past and present human knowledge, through the Internet. *Project Gutenberg* is accumulating a digital library of books no longer subject to copyright--in other words, free information. See http://www.promo.net/pg. Also see *The WWW Virtual Library*, at http://www.w3.org/pub/DataSources/bySubject/Overview2.html. At the other end of the time spectrum, ongoing research is being reported on the Internet as and even before its results come in. Because of the Internet, people without the gifts of Abraham Lincoln are enabled to rise to their full potential--despite the deteriorating condition of formalized education in America.

XVII. DEMOGRAPHICS OF WEB USERS. A Spring 1997 CommerceNet/Nielsen Internet Demographics Survey of World Wide Web use reflected the following information:

> 23% of total persons aged 16 and above in the US and Canada have access to the Internet. This is up from 17% in 1995.

> 17% of total persons aged 16 and above in the US and Canada have used the Internet and are on the World Wide Web.

> Among frequent Web users (i.e., someone who used the WWW within 24 hrs. prior to being surveyed), 71% most often use search engines to find Web sites. 9.8% use recommendations from friends and relatives; 8.5% use newspapers and magazines; 8.4% use links from other Web sites; 3.6% use television; and 3.3%

use printed Internet directories. 8.1% of the frequent Web user population reported that, most of the time, they locate sites by browsing or surfing around.

> Approximately 15% (5.6 million) of WWW users have purchased products or services over the Internet.

The foregoing information is from *The Commercenet/Nielsen Internet Demographics Survey*, <http://www.commerce.net:8000/nielson>.

Lawyers' use of the internet is explored in an article by Fred Parker, *On the Internet, the Future Is Now: Online resources can provide virtually unlimited opportunities for attorneys to save time while increasing productivity*, at http://www.ljx.com/ltpn/april96/p42parker.html.

XVIII. OVERVIEW OF FUTURE TECHNOLOGY.

A. Computers of the Future In an article in *Scientific American* 62-67 (Sept. 1995), Computer Science Professor David A. Patterson (of Univ. of California-Berkeley) suggests the following:

> Today's microprocessors are almost 100,000 times faster than their Neanderthal ancestors of the 1950's, and when inflation is considered, they cost 1,000 times less . . . . Looking ahead, microprocessor performance will easily keep doubling every 18 months through the turn of the century.

Patterson goes on to say that in the year 2020, one desktop computer will be as powerful as all of the computers in Silicon Valley today.

B. Wireless Technology. In the same *Scientific American* 69-71, George Zysman, Chief Technical Officer of AT&T Wireless Systems, observes that in 1983, industry analysts predicted that fewer than 1 million American would be using cellular technology by the year 2000, while in 1995 more than 20 million Americans do, and the number of cellular users is increasing 50% per year in the USA, 60% per year in Western Europe, and 70% a year in Australia. On the other hand, Zysman says that half the people alive today have never made a telephone call. Industry analysts are now predicting that by 2001, 3/4 of the households in the USA will subscribe to a wireless service. Zysman goes on to note that every 18 months the size of the digital chip needed to run a wireless phone or base station shrinks by 50%. He expects that before long, your cellular phone will strap onto your wrist.

C. Roadkill on the Information Highway. On July 11, 1994, University Video Communications (P.O. Box 5129, Stanford, CA 94309), released a taped presentation by Dr. Nathan Myrvold, entitled *Roadkill on the Information Highway.* Myrvold is the leading futurologist at Microsoft. Myrvold was formerly a theoretical physicist who worked with the world-renowned relativity physicist Stephen Hawking. See http://www.microsoft.com/corpinfo/staff/nathanm.htm.

Although *Roadkill on the Information Highway* is dated, it contains many observations that suggest what the future of technology may hold.

Myrvold starts the video presentation with the question: "How do computing and communication come together and change our world?"

1. Computing Myrvold explains that two technologies support the computer revolution: VLSI (silicon chip technology) and software.

Myrvold considers the price/performance ratio of computers over time. At a constant price, performance has gone way up. At a constant level of performance, the price of computers has gone way down. Myrvold says that computing power has increased by a factor of 1 million in the 20 years from 1970 to 1990, and that he expects it to increase by a factor of 1 million in the following 20 years. To make the scale more real, Myrvold notes that a factor of a million reduces one year to 30 seconds. Thus, when computing power increases by a factor of a million, that means that the new computer can do in 30 seconds what it would have taken an older computer one year to do. If there is a million-fold increase in the 20 years following that, then by the year 2010 a computer will be able to do in 30 seconds what it would have taken the 1970-era computers a million years to do.

Myrvold next talks of random access memory storage (RAM). RAM density increases by a factor of four every 18 months. The price of RAM drops 30% per year. Hard disk prices drop 60% per year. Myrvold predicts that, taking the size of your hard disk today, in 3 - 5 years you will have that much RAM. Disk storage will similarly increase. This ignores the possibilities of breakthroughs in optical storage (holographic memory), which would dramatically increase disk storage.

Thus, in the future we will be able to compute more, and store more.

Myrvold suggests that unimaginable performance will "blow out all stops." However, there are some problems that can never be surmounted, no matter how powerful computers become. An example is determining the various sequences in which 59 objects can be arranged. That is slightly more objects than a pack of playing cards. To compute all possible arrangements of the 59 items would be involve 10^{20} arrangements, which is what physicists estimate is the total number of baryons (protons, neutrons) in the universe. Thus, to print out such a listing would require all the matter in the universe.

There are also bottlenecks that will not go away. The chief bottleneck will be the human nervous system, which limits the amount of information that people can receive. Computers will be able to completely saturate people's ways of absorbing information, with computing capacity to spare.

2. Communicating On the subject of communicating, Myrvold notes that communicating has not followed the exponential growth that computing has. He likens the telephone company central switching office to mainframe computers, and pbx systems to mini-computers. They ruled the world before personal computers came along. However, mainframes and mini-computers were decimated by the microprocessor. Myrvold thinks two things will do that to the existing communications base: ATM switching and fiber optics.

Fiberoptics provides connectivity. Today we can modulate lasers very well, and can move bits in great numbers. However, today we cannot target where those bits go, very well. ATM switching controls where those bits go. Myrvold thinks that the ATM switch is analogous to the VSLI chip, and will make communications wide open. Phone bills have not dropped like personal computer prices. With ATM switching and fiberoptics, Myrvold sees competition entering, which will drive the price of communications down. Within 5 - 10 years, voice will be packaged with other services, like video-on-demand, and voice communications will be offered for free. In 1995, voice communication (which is at 9,600 baud) cost 30 - 60 cents per minute. In comparison, the raw communication cost of video was 50 cents/hour for 4 mega bytes/second. Plus, the price of new communications technology will drop, so that new competitors will be able to get equipment that is better than existing equipment, for a fraction of the cost of the existing equipment. The existing telephone network providers will be forced to cut prices and upgrade.

Myrvold sees all this leading to a switched digital network that offers point-to-point high bandwith digital communication. Information will become a utility.

Edison created the first electrical distribution company, but he needed a killer application ("killer app") to make it popular. The killer app was the light bulb. Electrical systems were then created around the world, for the sole purpose of powering light bulbs. Slowly other items were created that had electric motors that tapped into the electrical system. Soon, electricity ceased to be just the source for light, and instead became a general purpose utility that could be used for a host of purposes. Myrvold sees the same thing happening to information.

Myrvold sees that our two presently-existing information networks--the telephone network (point-to-point communication) and the cable network (one-to-many)--will merge into one "general information utility." Personal computers will not supplant televisions as a way of accessing this information utility. Both TV and PC's will survive. Even your water heater will be hooked up to the information utility. Information will be just as fundamental a utility as electricity is today.

Myrvold expects to see two types of data: digital on-line data and digital off-line data. Things that are now on-line will move off line. Thus, TV shows and movies will be available upon demand, and can be stored and forwarded to be viewed when the consumer wants to view them, and not when the network programs the broadcast.

Myrvold says that each technology has characteristic economics. Economic considerations are the primary constraint on how people use information. "Change the economics of information distribution and you change the world."

Before Gutenberg, a book was an object, like a sculpture. The price per copy was an enormous barrier--such a barrier that people did not even learn to read. Mechanical printing changed that. Every time you make it significantly easier to communicate, billions of dollars change hands.

Myrvold notes some dangers from the exponential growth of computing and communicating. If you're not fast on your feet, you'll be out of luck. There will be lots of room to succeed for those who do adapt.

Uncertain is whether the charge for information will be metered by the bit, or based upon the value of the information delivered. Uncertain is whether the new information utility will be driven by advertising (like radio,

TV, newspapers, and magazines) or more like books and movies, which are purchased by the consumer.

The winners will be the people who have the most open, most flexible business model that allows for the largest number of variations to occur.

Myrvold does not see the demise of current information experiences. Plays were supplanted by movies, but plays survive. Movies were supplanted by network television, but movies survive. Network television was supplanted by cable TV, but network television survives. Videocassettes supplanted network and cable television, but they both survive. In all those instances, the market just got bigger.

What is the killer app that will make the information utility take off? For cable TV, the killer app originally was better reception, now more choices. For PC's, originally the killer apps were wordprocessors, spreadsheets and databases. As for the information highway, Myrvold expects not one but many killer apps.

Myrvold expects the information utility to eliminate the need for warehousing--items will be manufactured upon demand. Banks now aggregate deposits and put the aggregated sums into the world's financial markets. The information utility will eliminate banks; you will put your cyberdollar directly into the world's financial markets. Middlemen of all kinds will be squeezed, since they are in the information business, and people will communicate directly using the information utility.

Information shows humans off at their best. Gutenberg changed lives for the better. In the new information revolution, who will win and who will lose is unknown. All we can do, says Myrvold, is try to avoid being roadkill on the information highway.

XIX. RECOMMENDATIONS ON INTERNET ACCESS The following recommendations relate to your getting access to the Internet.

A. On-Line Services One possible way to access the Internet is through an on-line service such as American On-Line, Compuserve, or Prodigy. Those on-line services originally offered only the package of products that were contained within their on-line "universe," with some linking to other independent computer-based databases. With the recent popularity of the Internet, the on-line services have been offering themselves as gateways to the Internet. Each service has its own Internet browser, which you can utilize

just by connecting to the service. Historically, however, these services have not had the best browsers. This disadvantage to using on-line services may be coming to an end, as the services upgrade their internet browsers. Another disadvantage of using an on-line service to access the Internet is that traditionally you had to pay connect-time charges to the service when you weren't even using their databases, and were merely using them as a gateway to the Internet. If you spent any significant amount of time on the Internet, you racked up large hourly charges with your on-line service. For that reason, many people considered contracting separately for Internet access through a local internet service provider [ISP] which bills you a regular fee for unlimited Internet access time. AOL has now gone to flat-rate pricing for unlimited connect-time, thus making AOL competitive with ISP's.

B. Internet Service Providers As users flood onto the Internet, Internet service providers (ISP's) are proliferating. There are several nationwide ISP, like Sprint and AT&T. Additionally, there are local ISP's in or near your hometown. The following sampling will give you some ideas. If you travel a lot, you may want to have a nationwide-ISP which you can access from anywhere. If you prefer to use a local ISP, you can have Internet access outside of your hometown by maintaining a subscription to an on-line service like AOL, Prodigy, etc.

C. Austin Internet Service Providers Austin Internet service providers include:

Austin Internet Access <http://www.austintx.net> offers unlimited dialup Internet access for $17.00/month, dialup ISDN access for $18.50/month. The Texas Bar Foundation selected this ISP.

Jump Point Communications <http://www.jump.net/index.html> offers dialup Internet access of 25 hours/month for $14.95/month, or 200 hours/month for $24.95/month.

D. Dallas Internet Service Providers Internet service providers include:

Dallas Internet <http://www.dallas.net>, located in Plano, offering unlimited dialup Internet connection for $24.95/month, with 20 mb of disk space for your home page;

FlashNet <http://www.flash.net/service/pricelist.html>, offering dialup Internet connection, unlimited usage for $17.95/month; with 2 mb of disk space for a home page;

OnRamp Technologies <http://www.onramp.net/online> dialup Internet connection, unlimited usage, for $29.95/month. Unlimited dialup ISDN access costs $39.00/month.

E. El Paso Internet Service Providers Several El Paso Internet providers are:

The Rio Grande Free-Net <http://rgfn.epcc.edu/gii tour>, which provides free Internet access under the auspices of the El Paso Community College District;

White Horse Communications <http://www.whc.net>, offering unlimited dialup Internet access for $20.00/month, analog or ISDN.

F. Houston Internet Providers Several of the Houston Internet service providers are:

First Internet <http://www.firstnethou.com>, which gives unlimited dialup Internet connect time for $19.95/month (for quarterly contracting); dialup ISDN is available for $39.95 (for quarterly contracting);

FLEXnet Incorporated <http://www.flex.net>, located in Montgomery County, offering service to both the 409 and 713 area codes; offers 10 mb of disk space for your home page; $19.95/month for unlimited dialup Internet access.

G. San Antonio Internet Service Providers Two Internet service providers located in San Antonio are:

Texas Networking Inc. <http://www.texas.net>, which services Austin, Dripping Springs, Georgetown, Houston, San Antonio and Boerne, and is expanding into Dallas offering unlimited dialup Internet access for $16.95/month (max. 4 hrs. per call);

Internet Direct Incorporated <http://www.txdirect.net>, which services San Antonio; Internet Direct offers unlimited dialup Internet connect time for one user for $19.95/month; unlimited ISDN connect time is $29.95/month.

XX. ISDN (DIGITAL) TELEPHONE LINES ISDN or digital telephone service is a mid-point between plain old telephone service and laser/fiberoptics. It uses the existing network of copper wires, but sends digital information.

A. What is ISDN? The following description has been given for ISDN:

ISDN (integrated services digital network) is a digital telephone line, that can be used for carrying large amounts of computer data. An ISDN line is actually 2 lines, or channels, each of 64KB capacity. These lines can be connected together, or aggregated, to provide 128KB of data capacity. In contrast today's fastest analog modem technology allows for a maximum of 33.6KB of data capacity, and that assumes a good quality telephone line.

See <http://www.rmplc.co.uk/rmplc/rmifl/isdnwhat. html> [8-21-98].

The following description of ISDN is given by Digitcom Multimedia Corporation:

"ISDN" stands for Integrated Services Digital Network, and, fundamentally, it is a switch in your telephone company's central office. In contrast to the normal analog switch that (probably) controls your telephone line now, this switch makes the connection--from the source of your signal through to the device at the other end--digital all the way. In this way, much, much more information can be crowded onto the copper wires running from your office, through the phone company switches, on to its destination.

All modems transmitting at 2,400 baud through the "fast" 28.8 kilo-bits per second (Kbs) are analog modems. These modems take the digital information coming from your computer and translate it into an analog signal before sending it out over the "plain-old-telephone" (POTS) line. For as long as it is taking place, the circuit can only handle only that one transmission. At the other end, another analog modem has to translate the analog signal back into a digital stream of information.

Moving to ISDN phone service is kind of like switching from vinyl records to CDs. Even at its most basic, ISDN allows your telecom connection to carry as many as three different "conversations" at the same time with the same twisted-pair copper wires you are now using to have just one voice conversation, or one fax transmission, or one online modem connection. This is accomplished by using multiple channels of information, increasing the available bandwidth from the 4kHz provided by POTS "voice" lines to two channels carrying 64,000 bits per second and a third data and control channel handling 16 Kbs.

See <http://www.digitcom.com/digitcom-multimedia/ dvforbiz/DVforBiz-ISDNgen.html> [Sep. 1996; link now dead.]

Read what Microsoft has to say about ISDN: <http://www.microsoft.com/windows/getisdn>. Also, look at the Texas ISDN Users Group: <http://www.tiug. org>.

An important aspect of ISDN is the fact that various types of information are integrated into one communication media:

The integration of different services has become an ISDN hallmark. In the past, video, audio, voice and data services required at least four separate networks. Video was distributed on coaxial lines, audio over balanced lines, voice used copper cable pairs and data services required coaxial or twisted pair cables. This multiple plant environment was expensive to install and difficult to maintain. ISDN is different. It integrates voice, video, audio and data over the same network and cable plant with quality not available in previous switched services. It offers features such as on demand networking, automatic bandwidth and on the fly connectivity. These advanced services are available, in large part, because ISDN is digital.

See "Broadband Integrated Service Digital Network," at <http://web.cs.ualberta.ca/~xinguang/513/513pre. html>.

B. Cost and Arranging for ISDN Service To subscribe to ISDN service in Texas, call Southwestern Bell at 1-800-SWB-ISDN (1-800-792-4736). It costs $328.60 (plus tax) to install one ISDN line, which equates to two lines ("channels") with two telephone numbers. However, if you sign a 12-month contract the installation fee is $203.60 (plus tax), and if you sign a 24-month contract the installation fee drops to $78.60 (plus tax) per ISDN line. Inside wiring costs extra. The cost per month for one ISDN line is $52.85 (plus tax) per line. Since one ISDN line can replace two of your regular telephone lines (which cost approx. $60.00 a month apiece), one ISDN line is cheaper than maintaining two of your current telephone lines.

If you use one channel of your ISDN line for your fax machine and analogue modem, they should both run faster because there is less "noise" on an ISDN line so data transmission on an ISDN line, even using analogue devices, is cleaner and therefore faster. You can use the other channel for a digital modem, digital telephone, etc.

XXI. USING THE INTERNET FOR LAW PRACTICE At the present time, the main value of the Internet to lawyers is as a vehicle for (i) research, (ii) communication, and (iii) marketing. *The Internet: What's Out There for Lawyers*, by Arthur L. Smith: <http://www.abelaw.com/bamsl/lpm/inet.htm>.

A. Research. Locating the information you want on the Internet is one of the challenges in using the Internet. Comprehensiveness and reliability of information is also a consideration when doing research on the Internet. *See Texas Legal Information Resources on the Internet: Back to the Future*, by Lydia M.V. Brandt (1996), <http://brandtlaw.com/lydia/orsinger-².html>. Also, what you do with the data you find on the Internet raises issues of intellectual property rights.

B. Communication. Communicating via the Internet raises issues of preserving confidentiality, creating an attorney-client obligation, soliciting, unauthorized practice of law, malpractice, and libel.

C. Marketing. Marketing legal services on the Internet raises issues relating to Bar control over advertising and soliciting, as well as unauthorized practice of law.

XXII. INTERNET: AREAS OF CONCERN. The areas of concern, regarding legal and ethical hazards for lawyers using the Internet, that are covered by this Article, are: advertising and soliciting, communicating with represented parties, unauthorized practice of law, preserving client confidentiality, malpractice, libel, and violation of intellectual property rights. An excellent resource for these issues is a WWW site,Legalethics. com,<http://www.legalethics.com>. This WWW site has links to papers on e-mail issues, advertising solicitation, and unauthorized practice of law. <http://www.legalethics.com/issues.htm>. There is also a list of articles covering a broad range of legal considerations regarding the Internet. <http://www.legalethics.com/articles.htm>.

XXIII. ADVERTISING AND THE INTERNET. The State Bar of Texas has been an early entrant into the arena of regulating the marketing of legal services on the Internet. On January 7 & 8, 1996, the Advertising Review Committee of the State Bar of Texas approved the following interpretive comment concerning how Part 7 of the Texas Disciplinary Rules of Professional Conduct will be applied to attorney presences on the Internet. Attorneys were given until June 1, 1996 to bring their Internet advertising into compliance and file it with the Advertising Review

Committee. This comment is available at <http://www.legaldir.com/pi/bar/tx.html>. That WWW site, maintained by Legal Marketing Management, Inc., contains "annotated hypertext summaries of all the Bar Rules pertaining to Internet communications and advertisements for each of the 50 states plus the District of Columbia."

[Beginning of Quotation]

17. The Internet and Similar Services Including Home Pages.

A. The Home Page First Screen.

Certain publications on the Internet or similar services are public media advertisements and are subject to the provisions of Part 7 of the Texas Disciplinary Rules of Professional Conduct. Unless the home page would otherwise be exempt from the filing requirements under Rule 7.07(d), a lawyer or firm publishing a home page on the Internet must file a hard copy, including the URL address of: (1) the first screen which is sent to the computer of an accessing person when the homepage location (URL) is accessed; and (2) any material changes in format that vary from the first screen of the original home page. Pre-approval for the first screen of the home page is available.

B. Information Linked to the First Screen of the Home Page.

Generally, additional information that the lawyer or law firm publishes on the Internet or other similar services beyond the first screen of the home page should not be submitted for pre-approval or filed with the Advertising Review Committee. However, additional information beyond the first screen that is primarily concerned with solicitation of prospective clients by a lawyer or law firm is considered public media advertisement that must comply with Part 7 of the Texas Disciplinary Rules of Professional Conduct, including the filing requirements of 7.07. The following examples are generally not considered to be primarily concerned with solicitation of prospective clients: newsletters; news articles; legal articles; editorial opinions; illustrations; questionnaires; fact or opinion survey forms; announcement of office openings and relocations; request for proposals or information from the public; legal product specifications; E-mail and E-mail response forms; attorney biographical information; announcement or personnel changes; attorney and support staff recruiting; job openings; legal development and events, including verdicts, judgments, court rulings,

administrative rulings, and/or legislation; announcement of seminars and events, including on- line registration forms therefor; links to other Internet sites (legal or otherwise); and entertainment/amusement devices.

C. Compliance with Part 7 of the Texas Disciplinary Rules of Professional Conduct Including Rule 7 .04(a-c) and (h-o).

Information that may not be considered primarily concerned with solicitation of prospective clients must still comply with the applicable provisions of Part 7 of the Texas Disciplinary Rules of Professional Conduct, including Rule 7.04(a-c) and (h-o).   Attorney biographical information must contain appropriate statements and/or disclaimers as required by 7.04(a-c). References to a submitting lawyer's or law firm's accomplishments or record, including verdicts, judgments, court rulings, and administrative rulings, must be accompanied by an appropriate disclaimer as well as the information set forth in Interpretive Comment 3 regarding unjustified expectations. The home page first screen must also disclose the geographic location by city or town of the lawyer's or firm's principal office.

In order to maintain consistency and bring Interpretive Comment 15 into line with the language in Comment 17, the following amended version of Comment 15 (which was previously published in the November Bar Journal) was approved by the Committee as well.

15.   Advertisements Referring to Additional Information or Recordings.

If a public media advertisement or writing refers to additional information which may be available to prospective clients, such as taped messages or printed pamphlets that provide information concerning a person's or entity's legal rights, the additional information should not be submitted for pre-approval or filed with the Advertising Review Committee. However, if the information contains matters designed primarily to solicit prospective clients by the lawyer or firm, then this information must be filed in accordance with Rule

7.07. A lawyer who responds to a request for information by a prospective client with an individualized letter is not subject to the Rule 7.05 governing written solicitation communications and is not required to file such letter.

[End of Quotation]

Thus, in Texas putting a home page on the WWW is considered to be a species of advertising, subject to regulation by the Bar. Note that interior pages of a WWW site must also be filed if they contain material changes in format that vary from the first screen of the original home page. Note also that TCRPC 7.04(f) requires the lawyer to keep a hard copy of the advertisement for four years after its last dissemination.

Changes have been proposed to the Texas Rules of Disciplinary Conduct to govern dissemination of information using the WWW. They can be found at <http://www.obeliskcom.com/arc/rulespro.html>.

Direct communication with others through the Internet can have features that might trigger solicitation rules, like Texas Disciplinary Rule of Professional Conduct 7.05.

It is suggested that the lawyer with a home page on the WWW "carefully scrutinize all material that is to be made accessible through a law firm home page to ensure that it complies with the advertising rules." *The Internet -- Hip Or Hype? Legal Ethics and the Internet*, by Professors Catherine J. Lanctot and James Edward Maule (Villanova University Law School): <http://www.law.vill.edu/vcilp/MacCrate/mcle/lanctot.htm>. The professors also suggest that "lawyers insure that postings to bulletin boards or chat groups for the purpose of obtaining clients also comply with the advertising rules." *Id.* The professors also suggest caution in initiating contact with potential clients. If such a solicitation would violate solicitation rules if done over the telephone, they suggest it would likewise violate the same rules if done over the Internet. *Id.*

In an article in *Internethics: What Every Texas Attorney Should Know About the Ethics of Advertising on the Internet*, by John P. Hagan, COMPUTER LAW REVIEW AND TECHNOLOGY JOURNAL 56 (Winter 1996/1997), Hagan draws a distinction between an informational home page and an advertising home page. *Id.* at 63. An informational home page republishes court decisions, law review articles or on-line discussions of the law. An informational home page does not propose a commercial transaction; a commercial home page does.   Hagan argues that informational home pages should be exempt from state bar ethical advertising regulations. *Id.* at 64.

XXIV. DIRECT CONTACT WITH REPRE-SENTED PARTY. Professors Lanctot and Maule, in their article on *Hip or Hype*, also raise the issue of direct contact with represented parties through the Internet. This can occur when: (i) a lawyer accesses the home page of an opposing party and communicates through e-mail; (ii) when a lawyer e-mails to someone represented by another lawyer, by responding to inquiries on a bulletin board; and (iii) when a lawyer is moderating a listserve or newgroup and an opposing party subscribes. *Id.* at p. 10. Texas Disciplinary Rule of Professional Conduct 4.02 prohibits communications with represented parties only where the lawyer is doing so "in representing a client." Therefore, communications that are not in the context of representing a client do not violate this standard.

However, what if you are representing a client who is litigating against a corporation, and you access that corporation's WWW site? Since that is a passive communication, it would probably not fit within the proscription. What if the WWW page permits interactive use, which triggers additional information from the Company? Does that constitute communication with the adverse party? Professors Lanctote and Maule cite *Ceramco, Inc. v. Lee Pharmaceuticals*, 510 F.2d 28 (2nd Cir. 1975), involving a motion to disqualify a law firm whose associate telephoned the order department of the opposing party, without identifying himself as opposing counsel, and obtained information pertaining to jurisdiction and venue. The court denied disqualification, but suggested that the behavior might technically be misconduct, but not sufficiently wrong to warrant disqualification. Lanctot & Maule, p. 11.

XXV. UNAUTHORIZED PRACTICE OF LAW. The issue of unauthorized practice of law arises when a lawyer practices law in a jurisdiction where (s)he is not licensed. For example, a lawyer participating in an electronic discussion and giving legal advice to a participant who is in a state in which the lawyer is not licensed to practice may be engaged in the unauthorized practice of law. *The Internet -- Hip Or Hype? Legal Ethics and the Internet*, by Professors Catherine J. Lanctot and James Edward Maule (Villanova University Law School): <http://www.law.vill.edu/vcilp/Mac Crate/mcle/lanctot.htm>. When a law firm's WWW site deals with interstate issues, such as federal law, and it draws inquiries from persons or companies located in other states, and those inquiries result in telephone or e-mail communications that constitute legal advice, is the legal service rendered at the lawyer's office, or Internet service provider's location, or at the quasi-client's office? The

answers to this question might impact the issue of in what jurisdiction law is being practiced.

Professors Lanctot and Maule suggest that lawyers avoid giving personalized legal advice over the Internet. You should go no further than you would in talking with a stranger over the telephone. They also suggest that, if the lawyer has a WWW site that includes a discussion group, all participants should be required to register and provide basic identifying information. *Id.* at p. 8.

XXVI. CLIENT CONFIDENTIALITY. Issues of client confidentiality and the Internet arise in connection with discussion groups, and in connection with misdirected or improperly intercepted e-mail messages.

When a lawyer posts a notice asking a question regarding a client's case, even if the names are changed and the facts disguised, perhaps a third party, such as the opposing attorney, can read the posting and glean information regarding the matter.

There is a problem with a mis-addressed e-mail, just like a misaddressed fax or misaddressed letter, as to whether a confidential communication loses its confidentiality by being sent to the wrong recipient.

Additionally, e-mail that travels the Internet is subject to interception at a number of points along its journey. This risk of interception of Internet e-mail is widely known, and therefore presents a possible argument that sending an e-mail by the Internet has no expectation of confidentiality, and thus is not confidential. Several state and local bars have suggested that an attorney should not conduct confidential discussions on a cellular telephone because they are so easy to intercept. *E-Mail and the Attorney-Client Privilege*, , p. 1, by Arthur L. Smith: <http://www.abelaw.com/bamsl/lpm/email. htm>. Ethics panels in Massachussetts, New York City, and New Hampshire have said that confidential communications should not occur over a cellular telephone, without informed consent from the client. *Malpractice Concerns Cloud E-mail, On-line Advice*, p. 3, by Joan C. Rogers (Legal Editor of the ABA/BNA Lawyers' Manual on Professional Conduct) : <http://www.bna.com/hub/bna/legal/adnew2.html>. Can the same thing be said about Internet e-mail? Apparently the State Bar of Iowa has said so. Iowa Ethics Opinion 95-30 (formal ethics opinion stating that attorneys must encrypt sensitive material before sending it by e-mail), cited in *E-mail: How Attorneys Are Changing the Way They Communicate*, p. 2, by Susan B. Ross,

<http://www.collegehill.com/ilp-news/ross -email.html>. The South Carolina Bar Association reversed its 1994 position and now says that it is not a breach of confidentiality to send unencrypted email. See Ethics Advisory Opinion 97-08, <http://scbar.org/ scbar/reference/EthicsOpinions/ethicslist.dbm> (search for "e-mail").

It is believed that proprietary e-mail systems like MCI Mail and AT&T Mail are more secure, as well as self-contained systems like AOL and Compuserve. However, it is certain that e-mail on those systems is subject to viewing by system operators who can view e-mail without leaving a trace, whereas U.S. postal employees and Federal Express employees cannot open an envelope or package without evidencing that fact. Encryption is the only way to guard against prying eyes of e-mail interceptors.

Writing in *Communicating with or About Clients on the Internet: Legal, Ethical, and Liability Concerns*, Attorney's Liability Assurance Society Loss Prevention Journal 17, 19 (Jan. 1996), William Freivogel, an ALAS attorney who works on loss prevention, wrote that he felt that fear of interception of Internet e-mail was exaggerated. The computers which pass e-mail messages pass thousands if not millions of messages per day, and identifying a particular computer, and trapping a specific message would take time, money, technical proficiency, and a willingness to violate federal law, 18 U.S.C. 2510 et seq. Freivogel concluded that lawyers may ethically communicate with or about clients through the Internet without encryption. He further stated that he did not believe that illegal interception of an e-mail message would waive confidentiality, or that criminal interception of an e-mail message would trigger lawyer liability. *See Malpractice Concerns Cloud E-mail, On-line Advice,* p. 5, by Joan C. Rogers (Legal Editor of the ABA/BNA Lawyers' Manual on Professional Conduct): <http://www.bna.com/hub/ bna/legal/adnew2.html>.

XXVII. MALPRACTICE. One of the key issues involving malpractice and the Internet is the inadvertent creation of an attorney-client relationship with someone who visits your WWW page, or who reads a posting you leave on a discussion site, or especially with whom you communicate by e-mail. Another malpractice concern is the revealing of confidential information through posting messages, or through sending e-mails that are sent to the wrong address or are intercepted and revealed. Another question is whether a lawyer has a legal duty to utilize the Internet for legal research or information gathering, as compared to using more traditional forms of research. Also, is there malpractice exposure for relying on the accuracy of

information obtained from the Internet which proves to be inaccurate? Much of the information on the Internet is unedited, and is correspondingly subject to error. Also, a search for case law conducted solely though the Internet might arguably be more prone to omission error than a search through a comprehensive database like Westlaw or Lexis.

XXVIII. LIBEL. The potential for making a libelous statement using the Internet is not much greater than by telephone or letter.

One big difference, however, is the extent to which a libelous statement can be disseminated using the Internet, and the fact that a statement placed on the Internet arguably is published all over the USA, and in fact all over the world, leading to the possibility of a suit being filed in a more remote location, and with potential injury to reputation being more widespread.

E-mail creates special concerns, however. Since e-mail is so informal, and is more akin to a voice conversation than exchanging letters, people tend to be more frank or revealing in e-mails than they would be in formal letters. This might lead someone into making a libelous statement that is in "print" in an e-mail message that they wouldn't dream of making in a letter. And yet the e-mail message is permanently recorded just as much as if the message had been typed into a letter. Not only can e-mail messages be stored or printed by the recipient, but a "written" record of e-mail messages can be saved in system back-ups of the sender's computer network. Employers who have a number of employees on an internal network, need to be concerned about libelous e-mail messages being transmitted on the internal network. And if the employees are connected to the Internet, employers need to be concerned about employees sending libelous e-mail messages over the Internet, under the employer's name. Most e-mail messages carry the employer's name and Internet address as part of the identifying information, which carries with it the possibility of tacit endorsement of the libelous statement.

XXIX. VIOLATING INTELLECTUAL PROPERTY RIGHTS. While we all have had the experience of standing at a photocopy machine and copying a case or an article, those types of violations of copyright laws are so private and so limited that there is virtually no chance of legal intervention. However, when copyrighted information is obtained from the Internet, it is so easy to digitally copy and republish it that such republication happens more often. If the information is republished at a WWW site, then it is republished for others outside the office to see, again

increasing the chances that the copyright owner will learn of a violation and become involved.

An interesting problem with the Internet is that browsing the Internet requires in the user's browser creating an exact reproduction of the WWW page in the user's computer. Since this is known to the persons who hold the copyright to the WWW page, there would appear to be an implied license to copy for this purpose. Now, are things different if I affirmatively download the WWW page (HTML code and all) onto my hard disk? In *Religious Technology Center v. Lerma*, 908 F. Supp. 1362, 1368 (E.D. Va.1995), the court held that a reporter who had merely downloaded information from the Internet to his computer disk was not liable for copyright infringement, saying that "the party who downloads information cannot be liable for misappropriation because there is no misconduct involved in interacting with the Internet." *See Net Users Could Face IP Liability*, by Christopher Wolf, THE NATIONAL LAW JOURNAL p. C-35 (May 20, 1996).

The "fair use" exception to copyright protection, now included in the Copyright Act, shields limited use of works for some purposes, such as educational, parody and criticism. Four factors are recognized in fair use analysis: (I) the purpose and character of the use; (ii) the nature of the copyrighted work; (iii) the amount and substantiality of the portion used; and (iv) the effect upon the potential market or value of the work. *Id.*

XXX. PERSONAL JURISDICTION In the past two years, states have been exercising civil and criminal long-arm jurisdiction over non-residence based on "virtual" contacts with the state. See *Statement of Minnesota AG on Internet Jurisdiction*, <http://www. webcom.com/lewrose/article/minn.html>; "Juris-diction Decisions of Note, "<http://ljextra.com/inter net/irjurisd.html>.

XXXI. E-MAIL POLICIES If you have management responsibilities for a firm, and your employees have access to e-mail, especially Internet e-mail, you might wish to consider adopting a firm-wide policy regarding the use of e-mail by your employees. Mark K. Smallhouse has set out some sample e-mail policies in *Drafting Effective E-Mail Privacy and Use Policies*: <http://www.pacificrim.net/~ncpl/EArt.html>. His suggestions include: (i) statement whether e-mail is solely for business or includes personal use; (ii) prohibiting sexual content or comments on race, creed or national origin; (iii) prohibiting use of a password unknown to the firm, and prohibiting the use of another employee's password; (iv)

reserving the firm's right to read e-mail and securing employees' blanket consent; (v) developing objective criteria on when e-mail will be monitored; (vi) blanket policy to delete e-mail within 15 days unless there is a specific business purpose; (vii) warning that e-mail can be forwarded or printed out, and the privacy cannot be assured; (viii) procedures for disciplining employees who violate the e-mail policy.

XXXII. SOURCE MATERIAL. The following on-line resources are used as the basis for this Article. In the on-line version of this Article, the URLs are actual links.

Advertising

1. *Attorney Sites Can Avoid Violations of Ethics Rules (A disclaimer can emphasize that a lawyer's Web site doesn't offer advice, solicitation or referrals)*; by Jeffrey R. Kuester, Special to the National Law Journal, Vol. 18, No. 50, p. B11, August 12, 1996 <http://www.computerbar.org/netethics/nlj. htm>.

2. *Ambulance Chasers on the Internet: Regulation of Attorney Web Pages*, by Mark Hankins, 1 J. TECH. L. & POL'Y 3, <http://journal.law.ufl. edu/~techlaw/1/hankins.html> (1996).

3. *E-mail: How Attorneys Are Changing the Way They Communicate*, by Susan B. Ross, <http://www.collegehill.com/ilp-news/ross-email.ht ml>.

4. *The Ethical Boundaries of Selling Legal Services in Cyberspace*, by William E. Hornsby, Jr. (staff counsel to the American Bar Association Commission on Advertising): <http://www.computer bar.org/netethics/abawill.htm>.

5. *Ethical Considerations of Legal Netvertising*, by Lori Christman, Keith Porterfield, and Brandon Unterreiner (August 1995): <http://www.com puterbar.org/netethics/brandy.htm>.

6. *How Do Advertising Rules Apply to Lawyers on the 'Net?*, by Joan C. Rogers (Legal Editor of the ABA/BNA Lawyers' Manual on Professional Conduct): <http://www.bna.com/hub/bna/legal /adnew.html>.

7. *The Internet -- Hip Or Hype? Legal Ethics and the Internet*, by Professors Catherine J. Lanctot and James Edward Maule (Villanova University Law School):

<http://www.law.vill.edu/vcilp/Mac Crate/mcle/lanctot.htm>.

html>.

8. *Internethics: What Every Texas Attorney Should Know About the Ethics of Advertising on the Internet*, by John P. Hagan, COMPUTER LAW REVIEW AND TECHNOLOGY JOURNAL 56 (Winter 1996/ 1997).

Preserving Confidentiality

9. *Client Confidentiality: A Lawyer's Duties with Regard to Internet E-Mail*, by Robert L. Jones, August 16, 1995: <http://www.computerbar.org /netethics/bjones.htm#fn19>

10. *E-Mail and the Attorney-Client Privilege*, By Arthur L. Smith: <http://www.abelaw.com/ bamsl/lpm/email.htm>

11. *E-mail: How Attorneys Are Changing the Way They Communicate*, by Susan B. Ross, 7/19/96: <http://www.collegehill.com/ilp-news/ross-email.ht ml>

12. *Drafting Effective E-Mail Privacy and Use Policies*, by Mark K. Smallhouse: <http:// www.pacificrim.net/~ncpl/EArt.html>.

13. *Malpractice Concerns Cloud E-mail, On-line Advice*, by Joan C. Rogers (Legal Editor of the ABA/BNA Lawyers' Manual on Professional Conduct): <http://www.bna.com/hub/bna/ legal/adnew2.html>.

Malpractice

14. *Lawyers and the Internet: Are You Connected?* by Courtney G. McKenzie, South Carolina Bar: SC Lawyer Magazine - September/October 1996: <http:// www.scbar.org/scbar/reference/sclawyer/ 1996so-a2.stm>

15. *Accidents On the Information Superhighway: On-Line Liability And Regulation*, by Marc L. Caden & Stephanie E. Lucas: <http://www.urich. edu/~jolt/v2i1/cadenlucas.html>.

Libel

16. *Responsibility as an Issue in Internet Communication: Reading Flames as Defamation*, by James A. Inman and Ralph R. Inman: <http://journal.law.ufl.edu/~techlaw/1/inman.