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Beyond the Internet - What Technologies are on the Horizon?

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What Technology Innovations are on the Horizon?

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Introduction

There are conflicting perceptions about the use of technology by lawyers. One view is that lawyers are traditional individuals who are slow to adopt cutting edge technology. The opposing view is that lawyers are technology leaders. I subscribe to the latter view. Lawyers were the first to fully utilize full-text databases. Lawyers were searching Lexis-Nexis during the late 70's and early 80's. Lawyers quickly adopted fax machines, e-mail and Internet services as soon as they were available. Consequently, I think lawyers are technology leaders. In order to remain technology leaders, we must be informed about the latest technology developments. The purpose of this segment of the CLE program is to gaze into the crystal ball and to offer some predictions for the future of technology. In a few simple words, the future of technology will be faster, smaller, more integrated and wireless. Will these predictions be accurate? Only time will tell.

Hardware

Hardware will become faster and smaller. Moore's Law – the concept that chip performance will double every 18 months - is still true. Hardware performance will continue to improve and the physical size of hardware will become increasingly important. Notebook vendors are always in a race to deliver faster, slimmer, and lighter models. In the upcoming year, the desktop market will join this race as well. As speed increase, the size of desktops will decrease. Dell's new third-generation chassis is 10 percent smaller than previous designs. Gateway's new all-in-one computers stores the processor and other components behind the flat screen monitor. The current cost of the Gateway model is approximately $1700. In order to

boost hardware sales, computer manufacturers will turn the attention to giving us back more of our desk top space (literally).

Floppy drives and 3.5 inch diskettes have already begun to disappear. Diskettes have always been notoriously subject to failure. Their storage capacity is minuscule compared to the size of most files nowadays. In February 2003, Dell announced that floppy drives would no longer be standard on high-end desktop personal computers. Now floppy drives are no longer standard on any Dell computer. The decision came as a result of customer focus groups. Dell asked customers, "Do you need a floppy drive?" Almost everyone answered yes. When Dell asked customers, "When is the last time you used a diskette?" Most people couldn't remember the last time they used a diskette. Flash memory (such as the removable devices used to store photos on digital cameras) and other portable storage devices will fill the void left in the storage market. Portable storage devices are small enough to fit on a key chain and yet have 100 times the capacity of a diskette. Most devices plug into the USB port on the front of your personal computer. Prices for 128 MB storage capacity range from $35.00 - $100.00. To locate vendors for these devices, use any Internet search engine and type in the phrase "USB drive."

Flat screen monitors will dominate sales in the upcoming year. Monitors will become thinner or slimmer. Prices will be cheaper. Increasingly realistic 3D graphics will be prevalent. Flat panel monitors are on everyone's wish list for the upcoming year. Over the next year 17 inch monitors will remain affordable but will not drop below $300. LCD flat panels sales will surpass tube display sales during this upcoming year.

Digital photography is here to stay and quality of images will continue to improve. 2003 was a pivotal year for photography industry. Sales of 35 mm cameras and film continued to

decline while sales of digital cameras have increased. One of the latest developments during that has encouraged the transition is disposable (or single use) digital cameras. You can now purchase a disposable digital camera for $6 - 10. Digital cameras will continue to become smaller in physical size and offer better quality with more mega-pixels. Currently in Japan you can purchase a digital camera that is the size of a matchbox. Cell phones will begin to affect the sales of low-end digital compact cameras.

Notebooks will, of course, continue to become slimmer and faster. Sony's newest "only in Japan" notebook (the X505) weighs a whopping 1.7 pounds and is less than half an inch thick at the front. Retailers joke to customers, "Don't cut yourself!" You can buy the X505 at http://www.dynamism.com for a mere $4799. Although, if you are willing to accept a nickel/carbon casing rather than carbon fiber, you can obtain the laptop for $3499.

Of course, the question on everyone's lips is whether battery technology will improve in the near future. Fuel-cell technology is a viable solution that promises to power laptops much longer and more efficiently than current lithium ion battery technology. A fuel cell is an electrochemical device that produces electric power from either hydrogen or alternative fuels such as methanol, propane, butane or natural gas. They do not require re-charging but instead require a refill of fuel such as hydrogen gas or liquid methanol in order to keep operating For years, scientists have experimented with fuel cell technology for powering electric and hybrid automobiles. However, recently there have been more breakthroughs in developing micro fuel cell technology suitable for powering laptops. Last June, NEC released its first laptop with a built-in fuel cell. (For full text of press release, visit: http://www.nec.co.jp/press/en/0309/1701.html). NEC plans to offer fuel-cell laptops that will

provide five hours of battery life to consumers in 2004. By 2006, NEC expects fuel-cells to power laptops for up to 40 hours. In addition to NEC, Toshiba has announced plans to ship fuel-cell laptops in 2004 . Japan's largest wireless phone carrier, NTT DoCoMo, also plans to introduce cell phones powered by fuel cells this year. Note, however, the FAA is not yet supportive since fuel cell batteries generally contain volatile fuel!

Another possibility for extending the battery life of laptops is MRAM (magnetic RAM). Have you ever been annoyed by the amount of time it takes your personal laptop or notebook to boot up after you have pressed the on switch? When you press the power button on your television, it comes to life instantly. MRAM has the potential to change the power cycle for personal computers so that turning on your personal computer will be similar to turning on your television. MRAM uses magnetism rather than electrical power to store data. MRAM is more energy efficient and reduces the amount of power consumption in a device. (For more information, see How Magnetic RAM Will Work, http://computer.howstuffworks.com/mram.htm).

Tablet personal computers are poised to make major inroads into the notebook market. Tablet personal computers are essentially a portable flat screen. One major benefit of the tablet personal computer is that you can take notes using a regular sized pen directly on the surface of the screen – just as if you were writing on paper! This might not seem revolutionary to the person who has used a personal digital assistant. However, the tablet personal computer offers a further advance...notes can be saved as an image or converted to text that can be word-processed or edited. Imagine having a wireless tablet personal computer that also has case management software or other useful tools such as PowerPoint, Westlaw, Lexis, etc. Current purchase price

for tablet personal computers is approximately $200 more than a comparably configured standard laptop computer.

If tablet personal computers don't become a dominant force in the technology market – and there are some prognosticators which predict they will not (the tablet pc has been referred to as an expensive Etch-a-Sketch by some technologists), some sort of handwriting detection device or digital paper will be successful. For example, Logitech has developed a new personal digital pen that remembers everything you write up to 40 pages. When you place the pen in its cradle, the stored data is uploaded to your personal computer. Cost for the new Logitech digital pen is only $199.00. For more information, visit: http://www.logitech.com.

Now for the "in the near future" hardware prediction. Thanks to advancements in the development of digital or electronic ink, bendable screens are closer to general production than you might imagine. Last year for this CLE, I researched this prediction and fairly quickly found an press release entitled "Trio teams up for bendable screens." In October 2002, Lucent Technologies, Dupont and Sarnoff announced an initiative to collectively develop a new display technology that could lead to thin, flexible monitors that can be wrapped around curved surfaces such as light poles. This year, the exciting news is that at the end of January, Phillips Research announced what it claims is the thinnest, most flexible, active-matrix display so far – a five inch rollable display that is one-quarter the thickness of a sheet of paper. By 2005, the rollable displays, which can now be used to read e-mail, could initially be used in military applications as electronic, updatable maps on the battlefield. So it's not so far-fetched to believe that a bendable screen might be in our future.

Wireless Networking

Without a doubt, wireless networking will be faster, more secure and more media-ready. As wireless standards continue to develop, wireless will become ubiquitous. Wireless access devices will become as popular as cell phones are today. Most laptops purchased within the last year or so include a wireless network access card. Intel's new Centrino technologies are optimized to increase wireless mobile technology. WiMax (IEEE 802.16) is one of the latest wireless standards on the horizon for significantly improving wireless access. WiMax can extend wireless networks as far as 30 miles and offers speed that is faster than cable or DSL. WiMax is a possible threat to cable modem and DSL providers. It will be especially welcome in sparsely populated areas which have not had the luxury of choosing either cable modem or DSL access. For more information on WiMax, visit: http://www.ieee802.org/16/pub/buzz.html.

Wireless access pricing models, however, are still in a state of flux. Some places offer wireless access for free. Other vendors are still struggling with flat fee subscriptions versus amount of usage subscriptions. For example, T-Mobile offers unlimited monthly subscription plan starting at $29.99 or pay as you go for only $6.00 per hour for wireless hot-spots such as airports, Starbucks, and Borders. Meanwhile Panera Bread offers wireless access for free at more than 115 cafes across the country. Nevertheless, subscription prices are expected to drop as more wireless hot spots become active.

One of the latest gadgets that is useful for those seeking wireless network access is the Kensington Wi-Fi detector. Without having to power up your laptop, you can press a button on your wi-fi detector and instantly determine if a location is "hot." The device is approximately 2"

x 3" so it travels easily. Three lights on the device indicate the strength of the wireless signal. For more information, visit: http://www.kensington.com/html/3720.html.

Courtroom Technology

More and more courts, both state and federal, will continue to adopt courtroom technology. Two of the most popular implementations are document cameras and video conferencing services. Not only is video conferencing cost effective, but it also allows for video conferencing technology allows for expert witness testimony as well as sensitive or child witness testimony.

It is possible that stenographers will be a dying breed. Several courts around the nation are experimenting with installing digital systems to capture court proceedings rather than using human stenographers. Costs associated with digital recording systems are a fraction of the costs of a stenographer. For example, the starting salary for a court reporter in the Santa Clara is about $60,000. By contrast, four recording systems cost about $25,000 total. Stenographers in Santa Clara launched a massive protest against digital recording and prevented its from being implemented in their courts. Stenographers argue that they can offer advantages that digital recording systems cannot provide. Stenographers can capture physical gestures such as shrugs. Also stenographers can instantly replay testimony upon request. Stenographers also point out that the devices could lead to violations of people's rights if they capture attorney-client and bench conversations. However as more and more states struggle with budget deficits it seems likely that digital recording systems will become inevitable.

More Convergence

Technologists have been predicting convergence among devices for many years now. We're finally starting to see some of these predictions become a reality. Personal digital assistants (pdas) are now being combined with cell phones. Cameras are being combined with cell phones.

It is safe to predict that a device that successfully combines voice, Internet access and e-mail into one unit will be available in the upcoming year. These devices will display photo images, provide games and play music. In fact, these devices will be so successful, that many people will find that they don't need a laptop or notebook personal computer. The December 2003 issue of the ABA Journal predicts that lawyers will be faced with whether to replace their PDAs and cell phones with cell phone/PDA combination phones. The newest cell phone/PDA combinations offer messaging capabilities, full keyboards, color screens and all of the functions of a PDA. In some instances, lawyers may even consider replacing their laptop with the new cell phone/PDA. One of the most popular cell phone/PDAs has been the Handspring Treo. For more information, visit: http://www.handspring.com

One recent outgrowth of the convergence trend is Voice-over-Internet protocol (VOIP). VOIP is poised for success in 2004. In December AT&T, Qwest Communications and Time Warner all announced that they're ready to roll out VOIP technology. VOIP uses internet packet switching technology rather than traditional telephone circuitry switching technology to deliver voice communications. Basically, VOIP allows use to use your broadband internet connection for long distance telephone calls. Just as you do not pay for sending e-mail messages to far-flung geographic locations, you also do not pay for sending voice communications long

distances via the internet. How do you make a telephone call using VOIP? One possibility is to use a software-based services and talk into a microphone connected to your computer. Another option is to plug an adapter directly into your cable/DSL modem and then into your existing telephone handset. You can also plug a gizmo into your PC's USB port and join a calling club, in which calls are free worldwide among customers. There are currently many different price plans available with various options. To view a chart listing the features and costs of various plans, read the article from February 2004's PC World, *Time to Switch to a Net Phone?*, http://www.pcworld.com/news/article/0,aid,114034,pg,1,00.asp

As devices begin to merge their functions and wireless access becomes commonplace, more and more Internet-enabled devices will become available.

- Microsoft has recently announced the availability of the Smart Watch (from Fossil and Suunto). Prices range from $179 to $299. In addition to web snippets from MSN Direct including stock quotes, news and the latest weather (a subscription to MSN Direct is required to take full advantage of all the watch features, $59.95 per year), the watches will display your appointments recorded in Microsoft Outlook. Also you can recent instant text messages from friends, family and co-workers.
- At a recent Consumer Electronics Show in Las Vegas, ScotteVest (http://www.scottevest.com) unveiled a jacket with integrated solar panels that can change mobile devices such as cell phones, PDAs, Game Boys, etc.

- Nokia (http://www.nokia.com/nokia/0,,43613,00.html) has introduced the Nokia Medallion as interactive electronic jewelry. Snap a photo of your latest inspiration and upload it in an instant to a wearable display on the necklace. Similarly Siemens Information and Communication Mobile Group (Siemens mobile) has created a new collection of personal communication devices in radically new shapes and wearable designs with simple voice functionality.
- Most of us are familiar with the implementation of Global Position System (GPS) technology in automobiles that provides safety and location information. In 2004 GPS technology will be heavily integrated into cell phones. This year driving directions, finding the best restaurant, etc., will all transfer down to our cell phones.

Conclusion - Future Legal Aspects?

What will be the impact of these future technologies on the legal world?

Privacy and identity theft will become an even bigger issue. As more devices store personal information , the chances for abuse will proliferate. As opportunities increase, computer crime will also increase. Hacker insurance will become essential for many businesses. Spam or unsolicited e-mail will have to be regulated somehow, although some technologists have actually been brave enough to predict that we will actually have anti-spam software that works in the near future. And finally, intellectual property will remain a hot button issue for years to come.