

## Business Communication High-Tech: Terms and Notes

Technology is changing the way we communicate.

### HOW

- new media, new channels - fax, e-mail, voice mail, text messaging and online chat, audioconferencing, videoconferencing, e-books
- document design, layout, fonts, faces, serif/ sans-serif, sizes, columns, flow text, graphics, decorative devices (avoid junk), use of space
- telecommuting, teleteams, telework (electronically distributed work)
- cyberphobia and connectivity are diminishing problems

### WITH WHAT

- computer applications that are friendlier, cheaper, faster, more powerful, smaller, more interactive.
- laptops, notebooks, palmtops, PDAs, cell phones, pagers, combinations.....
- "bandwidth"
  - twisted-pair phone lines – electronic – microwave transmission
  - fiber optic lines - photonic – satellite transmission
  - terrestrial transmission
- speed increasing yearly
  - speed of processor
  - efficiency of package or application
  - amount of “working room” on machine; amount of storage
  - high-speed connections – DSL, cable, T1, WIRELESS
- "weakest link"
- networks
  - Internet – LAN
  - WorldWide Web – "Intranet"
  - databases on line
  - "push media"
  - encryption
- scanners (text & image) and OCR readers - limitations.
  - barcode readers – grocery stores, highways
- voice recognition
  - voice input - text output
- databases, "presentation packages" (Powerpoint), spreadsheets, “suites”
- artificial intelligence; expert systems, “Knowledge Management”

## **ISSUES and POTENTIALS**

- **databases and privacy issue; security**
- **viruses**
- **virtual reality**
- **digital still photography**
- **CD-ROM → re-writable and re-recordable CDs**      **DVD - DVD/RW is improving....**
- **piracy and file-sharing – production of electronic products IS a huge sector of business.....**

What are "Mouseovers" – They're the little text-based definitions that appear when your cursor moves over a Web page hot spot. Java – oop, platform-independent.

### **How cheap? fast? powerful? big?**

#### **The "starter" computer in November 2002.**

Dell Dimension 4550 Desktop (\$689 after \$100 rebate)	<b>OR</b>	Inspiron 2650 notebook (\$999)
Pentium 4 processor 2.0 Ghz		Mobile Pentium 4 processor 1.7 GHz-M
17" monitor		20GB Hard drive
free 2nd bay CD burner		Free CD-burner or DVD upgrade
free hard drive upgrade		free hard drive upgrade

Printers and scanners are very inexpensive.

#### **The "starter" computer in January 1998.**

Total: \$1750. For \$1000, in January 1998 you got a Compaq Pentium Pro, 233 MHz, 3.2 gigabyte hard drive, 20X CD-ROM drive, 56K internal fax modem, audio and JBL speakers, 64-bit graphics, 2 megs video memory. For another \$350, you get a 15" color monitor. For another \$400, you got the Hewlett-Packard OfficeJet 300 all-in-one color printer with built-in scanner, plain-paper fax, and copier.

Laptops cost more than desktop versions, with pretty good ones available for \$1000 – \$1500.. So far, there is a limit on what can be included in a 5-pound, 1.5" x 11" x 10" machine. Some components - e.g., the CD-ROM -- might have to be external – but not always.

Newer versions of application programs are bigger, demand faster processing and more RAM, and generate files that take more disk space to store.

Images are especially "greedy" of space. At moderately high resolution, a photograph can easily use up 2 megs or more of disk space. You can compress a file or size the image downward, but may lose resolution when you uncompress it or size it back up. Resolution of ~600 dpi (dots per inch) is fairly high; 200 dpi is moderate; 56 is low.

Ten years ago people discussed kilobytes; five years ago, megabytes; now, gigabytes; increasingly, terabytes (millions of megabytes). Processing speed is also nudging into the "teraflops" range on high-end machines.

Many options exist for storage. Besides internal hard disks and floppy disk drives, computer users can buy various external drives. Prices vary depending on type of shopping outlet: mail order or online, major computer superstore, or smaller computer store. An Iomega Zip or Jaz Drive or a writable CD-ROM disk holds huge amounts of data.

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### **Internet and WorldWide Web**

Business people make increasing use of the internet and WorldWide Web. This is a nonexhaustive list of uses of this powerful new communication medium by business workers.

E-mail

Reference, information, and research

Telecommuting  
Phone voice traffic, routed through internet  
Replacing print merchandise catalogs  
Backing up and storing large files remotely  
Transferring funds electronically  
Direct investing  
Ordering merchandise and services  
Order follow-up and invoicing  
Payment of invoices  
Profiling customers  
Building customer databases  
Distributed work-group communication

Paperless transfer of very large files among locations  
Earning academic credit hours and taking training  
Job seeking  
Employee recruitment  
Background and credit checks  
Business news  
Professional information  
[Goofing off – though they're not supposed to]  
Hotel and air reservations for business travel  
Online tech support

###

Virtual reality first appeared in the late 1960s in U.S. Air Force flight simulators. Now it's used in

- selling (Japan, Matsushita Electric Works shows - and sells - kitchens that aren't built or furnished yet but can be seen, rearranged, redecorated, and "walked through")
- medicine (surgeons can practice microsurgery on a "virtual knee" before ever cutting into a live human joint)
- air traffic controllers can practice guiding planes in without putting any real human beings or equipment at risk
- financial modeling (user can construct, change, and seem to walk among bar graphs and other information displays)
- architecture (architects and clients can both "walk through," see the effects of design decisions, and avoid problems)
- national defense (VR was used for war maneuver planning during the Gulf War and during the Bosnian crisis)
- treating people who are terrified of flying on airplanes

and numerous other applications including video games, popular despite quite high cost of play.

Its most basic form requires a headset and dataglove or joystick. (A whole-body version has a datasuit.) The helmet blocks the view of what is actually out there (generally an empty room), and presents the wearer with computer-relayed images on two small video screens (for 3D vision) that change depending on how the wearer turns his head. Sound and touch sensations can be programmed in, too. Sometimes there's a treadmill -- the walker seems to move through a space. But there's nothing there -- it's all inside the helmet and all comes from stored computer data.

NASA programmed the information on the planet Mars' surface into a VR system. The person wearing the helmet could turn left and see what he would see if he were walking on Mars. If he turned all the way around he could see what was behind him. At Chapel Hill, NC, at the University of North Carolina, there is a virtual art gallery. (UNC is a major center for VR research.)

VR allows people to do work in dangerous environments. For example, an unmanned submarine sent to explore a glacial lake in Antarctica relayed camera images to the remote operator of the sub. The operator, in a nice, climate-controlled room, could see whatever the sub was seeing and drive the sub, on that basis. For another instance, a person can operate delicate controls from outside a radiation-flooded space by wearing a glove that directs a robot arm inside the space. Both of these are examples of "telepresence."

It's still pretty cumbersome. Equipment is heavy and intrusive, and it interferes with naturalness of movement. Graphics are still pretty rudimentary. You wouldn't mistake VR for reality but you DO get very caught up in the experience. Some people get motion sickness. Prices are coming down but are still fairly high. In the last couple of years, software has been available for making Websites more effective and more interactive.

Caution: As in the case of software that enables people to alter photographs seamlessly (see below), VR opens some avenues of abuse. When it improves to the point where it becomes difficult to distinguish it from reality, the potential for abuse (brainwashing, compulsion, etc.) becomes much greater. Ethical considerations must be recognized and explored.

###

**Digital Still Photography** - Any photograph can be captured on, or scanned into, a computer disk or CD-ROM. Software will let users crop an image, zoom in, rotate, invert, change any color to any other color, and do even more to the image than used to be possible in a photo lab.

Image processing programs such as PhotoShop offer tools that let you sharpen the edges of a fuzzy image, or fuzz them back up. You can delete images in the photo that you don't want. You can import an image from a different photo and make it appear as though the imported image was always there. If you snap a bad picture, you can make it into a good image on disk. One person appears large because he stood nearer your lens than another person in the shot? Select one of the persons, write it to a new file, change the size, select it in its changed form, then paste it where it was -- or nearer or farther away from the other person, if it would make a better picture. The image processing programs contain most of the tools in MacPaint and SuperPaint (lasso, airbrush, paintbrush, etc.) and a number of additional ones.

Kodak's system uses a photo disk holding up to 100 images. Users can work with the images until satisfied, then play the pictures on an ordinary TV using a Photo CD player.

The technology lets people like you and me customize photos and other images and incorporate them in desktop-published documents.

**Cautionary note:** People must understand that just because they're shown a photograph of something, what they see is not necessarily fact. Photographs can now be made to display what never happened - without a trace of the manipulation that produced the false image. -- When work is hastily done, however, odd things can happen.

###

**Electronic Pen and Electronic Clipboard.** "A PC that reads your writing," some enthusiasts call it. The user hand-prints on a screen using an electronic stylus. The system recognizes and reads the hand-printing. The application is very good for forms completion.

The notepad computers are used by

- police officers
- insurance adjusters
- delivery personnel (electronic maps and routes - as well as forms - can be stored. A user can ask, "What's the shortest route between the dock and my first delivery?")
- pollsters and field researchers
- sales agents (pharmaceutical sales require a doctor's signature for drug samples - the signatures can be captured electronically and retrieved later).

The system can store a sketch, as of an accident site. It can contain typical images - a car, for instance, whereon an adjuster can mark damage locations.

Most have LCD screens. The units contain pattern-recognition software; then users have to train the machines by hand-printing samples repeatedly so that the machine "learns" how each user habitually shapes letters. This takes about 30 minutes. The machines don't do as well reading cursive writing.

Electronic signatures, however, are used by many retailers, and can be used for legal purposes under some circumstances.

Some people have refused to enter the computer age because they hate keyboarding. Fast keyboarding is an advantage only in word processing - data for virtually all other applications can be entered about as fast by hand-printing as keyboarding, and voice-to-text input is improving fast

###

**E-books?** As of January 2000, only a few firms were making electronic books, and sales numbered "in the thousands" of units. Nuvo-Media's product is ". . . Rocket Ebook, a hand-held consumer device that can store as many as 55,000 pages of text and graphics." It weighs 1.3 pounds and sells for \$199. SoftBook Press offers SoftBook Reader, heavier (2.9 pounds), more capacious (85,000 pages), priced at \$599, and intended more for corporate than consumer use. (Kaplan, K., "Gemstar's Maneuver Into E-Books Hard to Read," Los Angeles Times, January 24, 2000), pp. C1, C6.) Kaplan says that although "futurists believe electronic books will be widespread in about a decade, the devices have yet to catch on with consumers."

A SoftBook press spokesman said mainstream publishers have made fewer than 4000 titles available. The small number of e-book users doesn't exactly beckon publishers, who tend to think in mass-market terms. The few popular titles available at present won't create the critical mass of e-book users that would make e-book publishing profitable. Barnes & Noble, however, announced it intends to move into electronic-book publishing. If their move overcomes the inertia, e-books may take off. (Kaplan, pp C1,C6).

###

**Multimedia** adds sound, animation, and video effects to presentations that formerly relied on text and graphics. Typically, a sophisticated multimedia system needs CD-ROM and/or some other very large digital storage device. The presenter can store an entire presentation on the Web if he knows he'll be speaking in a presentation room with Web access. A user can access information from many sources and in many formats from a single computer console.

When multimedia was new, its uses were limited to commercial information, entertainment, encyclopedias on CD-ROM, etc. Once costly to produce, complicated to use, and needful of specialized equipment, multimedia today is much easier to use. An ambitious PowerPoint presenter can embed virtually any "effect" in a prepared presentation. You'll see multimedia and interactivity in training, marketing, and sales. One example: Trainees in customer service could be presented with a problem, could decide how to respond, respond, and immediately see and hear the probable outcome of the strategy they chose.

###

A great many R&D departments are working on advanced applications. Technical and marketing barriers are holding up many of them. "For instance, there's no standard format for digitizing and manipulating all this information. Given the difficulties of forging standards within any one of these industries, says Intel Corp. President Andrew S. Grove, the idea of easily creating a lingua franca for the digital world is 'naive beyond belief.'"

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**Still Good Advice:** An interview article in *IABC Communication World*, March 1991, 15-23 offered these warnings to people who communicate via computer:

#### Computer Security: Who's Responsible?

As computer systems grow more commonplace in today's businesses, maintaining the security of these systems becomes the responsibility of every employee. . . .

- Never leave disks unguarded on desks or anywhere else in sight.
- Never walk away from computers while still logged onto the system - especially in a LAN (local area network) environment. Hackers often "tailgate" into a system after an employee finishes working and neglects to log off.
- Never write down log-on sequences, passwords, or any other codes that regulate personal access to a system.
- Never download public domain software or any files from electronic bulletin boards or other communication systems without running it through antivirus software. This is the easiest way for a virus to get into your system.
- Never bring in disks from outside the company.
- Back up files continually to save data that might be lost because of a security breach or virus.

###

#### Technology and Power

In organizations, for many decades the saying has been "Knowledge is Power." Through information systems, knowledge is being used and stored differently. Information used to reside only in individuals' heads or paper files. Now that more and more of an organization's knowledge is stored collectively in computer databases accessible to many, we have seen layers of middle management downsized. The more people who can access the knowledge, the less power the knowledge brings to the possessors.

We will continue to need expert power, but as computers are able to duplicate increasing proportions of the analytical works that experts used to do, even expert power is being spread out. "Information hoarding" is less possible than it used to be, and is less a source of power. Differences between jobs are diminishing as more people can cross-train with computer-based information and tools. Expert power that is not easily duplicated or substituted can still exert leverage.

#### Knowledge Management

Dow Chemical Co. has a "director of global intellectual asset and capital management." The incumbent, Gordon Petrash, said, "Companies are leapfrogging others based on their intellectual assets. If a company is not addressing these things, it's running a very high risk, because a lot of other companies are." Coca-Cola, Monsanto, and IBM also have chief knowledge officers or their equivalents. So do Ernst & Young, Coopers & Lybrand, and Andersen Consulting.

The premise . . . is simple. Employees hold a wealth of knowledge and experience about their company – from its products, customers and competitors to its production processes and internal technology. But much of that knowledge is held in bits and pieces by various individuals or sections of a company.

If these bits and pieces could be gathered and distributed throughout the entire company, the reasoning goes, the shared knowledge – a sort of collective IQ – would become a powerful force. Workers could use the pool of information to create competitive advantages and increase revenue. A company, for example, might discover that a process used in one sector could have applications in another. Or a company representative, using all of the company's knowledge about a customer, could make a superior presentation to the client, helping to seal a deal.

Now, advances in databases and computer networks are making such projects possible. Computer-networking technologies are providing the tools for the creation of “knowledge bases,” “knowledge webs” and “knowledge exchanges.” But it takes more than just sophisticated technology to make such systems work. Sifting, editing, and updating knowledge turns out to be a management, rather than a technology, challenge. And, more important, it takes a manager to ensure that workers are inspired to contribute to the knowledge, share it and absorb it. . . .

Corporate spending on knowledge-management consultants is expected to rise more than tenfold to \$4.5 billion in 1999 from \$410 million in 1994, according to Dataquest Inc., a market-research firm in San Jose, Calif. Those numbers don’t even include costs for computer hardware and software or internal expenses.

Firms are using incentives to get people to share knowledge instead of hoarding it. People resist because information sharing takes time; there is too much raw data and too little information; and they dislike giving up information they think others might use to get ahead of them.

John Peetz of Ernst & Young said, “The health-care industry, for example, doesn’t just want really bright people anymore. They want people who know three-quarters of the answer the minute they walk in the door. You can’t do that without a knowledge base.”

To establish the database, Mr. Peetz had to persuade the firm to change the way it thinks about knowledge. Many people feared that wide publishing of Ernst & Young’s best ideas would inevitably lead to leaks to their competitors. “An idea by itself has relatively little value; the key is rapidity and execution,” Mr. Peetz says. “The risk of losing our ideas is not as high as the risk of not capitalizing on them.”

--Bank, David. Know-it-alls: Chief knowledge officers have a crucial job: Putting the collective knowledge of a company at every worker’s fingertips. *Wall Street Journal*, 11-18-96, R28.

###

**CD-ROM** This medium, which began in the recording industry, now forms the basis for much software that you buy and for many of the databases you search.

In summer 1997 a database called Megan's Law CD-ROM was pressed. It lists the names and ZIP codes of CA's 64,000 registered sex offenders. Megan Kanka was killed by neighbor Jesse Timmendequas, a twice convicted child molester. --*Newsweek*, 8-11-97.

In 1997 a writable CD became popular. A user buys a computer add-on called a diskburner and can store any kind of digitized information: music, images, text, or anything else.

In 2001, so many people had CD burners and were downloading and saving music on them from Napster and other music-sharing websites that music industry representatives took Napster to court and forced them to limit operations sharply. Napster is out of business, but many other file-sharing organizations are alive and vigorous.

**Continuous Speech Voice Recognition Software:** In August 1997, IBM began marketing IBM ViaVoice (\$99 at product introduction) for Windows95 and WindowsNT. **IBM says you don't have to disjoin words.** "So now when you talk to your PC, you can speak naturally and conversationally, the way you would to a friend." [ad in LA Times]

One year later, FreeSpeech 98 (manufacturer is Philips) debuted at \$39 a copy. With good accuracy this program translates speech into text. It knows 240,000 words and "can be customized to recognize 64,000 more." (*Newsweek*, July 13, 1998, p. 10).

The March 2, 1998, Newsweek praised new natural-language call-router systems. Lucent Technologies is offering phone answering software that asks customers, "How may I direct your call?" The customers can answer just the way they would if they were talking to a human operator. "The computer looks for words it understands, analyzes their place in the sentence and then routes the caller to the appropriate department – or transfers the request to a live operator if it's confused. Similar but less sophisticated systems are now widely used for making stock trades and travel reservations over the phone." (Are you talking to me? p. 86).

Word processors increasingly incorporate voice recognition software; it works imperfectly but is improving. It is useful for people who do not have rapid keyboarding skills.

### **Translation Software:**

Numerous devices and software packages perform translation from one language to another on a limited basis. Familiar, everyday phrases and sentences are easy to translate. "Which way to the Hilton Hotel?" "How much to buy a bowl of steamed rice?" "I would like to book a coach-class ticket to Munich." Common statements and requests are well understood if a person stays with the plainest way to say something.

Many phrases are polite formulas that do not involve literal meaning. A phrase like "good morning" is not even thought of as meaning "I hope that you have a good morning today." A traveler needs, instead, whatever people say by way of greeting in the area where he is traveling. Translating into Arabic, for instance, he needs "Salaam aleikum," which means, approximately, "peace be with you."

When a speaker needs to say something complex, translation becomes more difficult. Most ideas can be expressed in many different ways by a native speaker. For instance, think of all the many ways you know how to tell someone he or she has made a mistake (direct, indirect, tactful, frank, joking, sympathetic, sarcastic, etc.).

Recall that every language is a set of symbols. Each speaker of a language carries in the mind a meaning for that symbol; yet no two carry exactly the same meaning even for a concrete word like *table*. For less concrete words, differences are even greater. For instance, the word *respectful* would call up an entirely different set of behaviors depending on the situation – or the culture – in which the speakers found themselves.

All the problems a computer has in recognizing a word in one language become far greater when the computer is given the task of translating into another language.

The languages themselves operate on different sets of rules. For instance, word order is essential in English but not always as meaningful in another language. In the sentence, "The man gives the seller some money," those words must be in that order to preserve that meaning. If we swap places among the nouns, we change the meaning drastically. ("The seller gives the man some money" or even, improbably, "Some money gives the man the seller.") Latin permits swapping word order. The who-did-what matter is determined by the endings on the words. "Vir venditori pecuniam donat" and "Venditori pecuniam donat vir" mean the same thing: "The man gives the seller some money." To say that the seller gives money to the man, we would say, "Venditor donat viri pecuniam" or "Pecuniam venditor viri donat" or even "Viri pecuniam venditor donat."

In English, we often need multiple "markers" to express that an idea is plural. For instance, in "These six boys ride their bicycles" every word in the sentence expresses plurality. The Mandarin Chinese language would use a word for boy, a word for six, a word for riding, a word for bicycle, but would not see any reason to indicate plurality many times. Mandarin, however, uses voice inflections, called tones, to differentiate word meanings. Mandarin has a high-and-level inflection, a rising inflection, a falling-then-rising inflection, and a downward inflection. Depending on which one a speaker uses, the entire meaning of a word changes. Just as it is hard for a native speaker of Mandarin to get used to the idea of multiple plural markers, it is difficult for a native speaker of English even to HEAR the differences among tones, let alone reproduce them accurately.

Infants and young children learn the language that surrounds them. Until roughly the age of puberty, a child can learn to speak a new language effortlessly and without any accent. After this age, language acquisition becomes more difficult. Young children assimilate all the “rules” by which the ambient language operates. Very early, they can structure grammatical sentences and recognize whether other people’s sentences are correct or meaningless.

Dr. Sandiway Fong, an MIT graduate who works for the NEC Research Institute, is working in computational linguistics to create a computer that may one day be able to do simultaneous translation with very little help from humans. His work is based on that of Noam Chomsky, who believed that all humans’ brains are “hard-wired” for language and that there are some universals underlying all language. Theoretically, if enough of that “wiring” can be programmed, translation should be possible. It is, however, a formidable task.

Dr. Fong spends his days taking sentences out of language books, tearing them down word by word, and identifying subjects, objects, verbs and clauses. He assigns each item a “symbolic category” according to its placement in the sentence. Then he feeds the information into his Sparcstation 2, backed up by processing power in mainframe computers in Tokyo, Princeton and MIT.

He taps in a sentence; “Which report did you file without reading?”

Before his computer can translate a sentence, it must be able to “understand” it – that is, match it against recognized grammatical principles. Dr. Fong notes that a person hearing the filing sentence knows that the same individual doing the filing is also doing the reading, even though “reading” isn’t preceded by a subject. The listener must also decide if the word “file” is a verb, a noun or a redundancy of the word “report.”

“Subconsciously we know this, because the principles we’re programmed with tell us it is so,” he says. Dr. Fong’s computer knows this too, and terms the sentence acceptable.

When all of this programming is completed, . . . he’ll begin building a program that tells the computer to match a sentence in one language against the principles of another to perform translations. “We want to build in as much theory as we can before working on the translation,” he says. . .

So far, Dr. Fong says he’s “been able to reduce thousands of grammatical rules to ‘a couple of dozen principles’ that can be used with many languages.” All languages? Theoretically, yes, he says.

--Keller, John J., No tongues too twisted for computer, *Wall Street Journal*, November 3, 1992, B6.

Most other translation equipment does not attempt so much. One package, called “Transparent Language,” teaches a user to read and understand another language, such as French, German, or Spanish. It is straightforward: “You read the original foreign-language text on your screen unaided as much as you can. But when you get stuck on a word or phrase, pressing a key brings a translation into view complete with the linguist’s explanation of why certain portions are translated the way they are.” The user cannot ask it anything new, however; the software translates only the material that came in it. The package does not address spoken language nor teach the user to write new sentences. It just improves one’s ability to read the language.

Another, “Japanese in a Breeze,” “does an excellent job of teaching the basics of the Japanese character set. It does not teach the grammar or the way to speak the language, although it does teach the sounds of the characters. Japanese has two character sets, hiragana (46 basic characters) and katakana. You can learn either or both.

There are 46 basic characters in the hiragana set, plus you learn about 1,200 words combining those characters. The program presents large graphic depictions of each character, complete with step-by-step illustrations of how they are drawn. You practice drawing your own on paper, not on the computer screen.

The reviewer of the program said a person wanting to travel in Japan could use the program to learn how to read most printed words (street signs, menus, etc.) that he would encounter.

Spanish Assistant, a third software package, received poor marks from the reviewer.

Spanish Assistant is basically a word-by-word translator, using companion 30,000-word Spanish and English dictionaries from Random House. Unfortunately, many sentences cannot be properly translated word by word.

I enlisted the help of three bilingual colleagues to translate a simple newspaper story about the Cinco de Mayo celebration from English into Spanish.

The program translates a sentence at a time, word by word. Whenever a word is not in its dictionary or it could have several meanings, a window pops up on the screen offering you the choices available or asking you to supply the missing translation. Both the original English text and the translated Spanish text are easily edited from within the program.

We encountered problems in virtually every paragraph. For instance, the program saw *even though* as two separate words, not as a phrase. Thus it didn't offer the right Spanish translation, *aunque*, until it worked on *though* after first offering a set of improper translation choices for the word *even*.

The consensus of my panel of experts was that if you knew Spanish well enough to see and correct the mistakes being made by Spanish Assistant, you could probably do the translation just as fast without it. But if you didn't know the language that well, the program would demonstrate your illiteracy to whomever you showed or sent the translated document. -- O'Reilly, Richard, Help in learning another language, *Los Angeles Times*, May 9, 1991, D3.

As of February 1998 translation software had improved but was still nothing like a skilled human translator. Lawrence J. Magid reviewed several translation packages and Websites, with mixed results:

Everyone I wrote to understood the gist of what I was saying but complained that the grammar was atrocious . . . Computerized translations are not always accurate and often miss subtle nuances. Still, just being understood is a big step for someone who doesn't speak a language. The key is that both the sender and recipient understand the limitations of the technology. For example, I wouldn't dream of using any of these programs to translate my columns and post them on my Web page or submit them to a foreign-language newspaper. And whenever I use a program to translate an e-mail message, I let the person know it is a machine translation. -- Software, Web sites chipping away at language barriers. *Los Angeles Times*, February 23, 1998, p. D4.

Magid analyzed Power Translator 6.0 (\$149, Windows 95), Universal Translator from LanguageForce (\$99), and Systran (all prices, from \$29 to a \$995 professional edition and a client server version costing \$3,995 and up).

Two on-line translators are Globalink's Comprendre service (<http://www.comprendre.globalink.com/>), a free beta version that won't be there forever; and an AltaVista/Systran free offering at <http://babelfish.altavista.digital.com>, which translates among English and Italian, German, French, and Spanish. [Gilsdorf has NOT tested these.]

Many websites offer translation from one language to various others. Most sources say that the on-line translators can give a reader the gist of a text but still contain many errors and problems. Also, they translate only straight text. They usually do not translate anything that's in a box or visual.

## Scanners

**Document Scanners** As of 2001 a moderate-quality scanner costs about \$150. If a user has an OCR (optical character recognition) program such as OmniPage, a document can be scanned, edited, and saved to a word processing (or other) file. Users will probably need to do a lot of editing. The OCR function is fairly good, but tries to assign meaning to every speck or blur on an original.

The scanner will digitize pictures as well, allowing users to save the images in a variety of formats. If saved into an image processing application such as PhotoShop, the image can be enhanced in many ways and printed out at high quality.

**Scanners for ATMs** In testing and expected soon: Scanners at ATMs will scan the customer's eye (thus obviating the need to memorize PIN numbers). Identification is expected to be so foolproof that the ATM will be able to cash checks, process loan requests, take payments for bills, sell traveler's checks, send money by wire, and maybe sell postage stamps. (Kiplinger's Retirement Report, January 1998, p. 8).

**Scanners for Border Traffic** Some border crossings use scanners. On I-5 at the San Clemente checkpoint, in June 97, they began an experiment with an automated lane that uses the same barcode technology used at checkouts in supermarkets. Cars will have bar-coded window decals that will be hard to counterfeit. The first year, pre-approved drivers will need to slow down and be waved through by a guard, but in 1998 they plan to "add transponders to vehicles so they can go through without slowing down."

At Otay Mesa on the Mexican border, authorized cars already have transponders, "similar to the kind used for automatic billing on the new toll roads," that approve them to move through a fast lane instead of waiting up to 45 minutes to cross.

"In Scobey, Montana, on the Canadian border, testing is underway on what is being called the world's first voice-activated port of entry, one that allows carefully screened residents to raise the gates by entering a PIN number and uttering a previously recorded secret phrase into a telephone. A TV camera allows inspectors to monitor crossings from miles away."

"At airports in New York, Newark NJ, and Toronto, low-risk travelers insert a card into a machine and place a hand in a scanner to clear immigration. A similar system is planned for LAX in 1997." They haven't caught any impostors or found any counterfeit devices, but sometimes the system has kept AUTHORIZED people out by mistake.

Simon, Richard. Border crossing made easy: One way is to use bar codes on cars, just like at the supermarket. *Los Angeles Times*, June 29, 1997, B2.

## **Videoconferencing**

Although many organizations still have only slow-scan/freeze-frame videoconferencing, two-way, full-motion fully interactive videoconferencing is the ideal. To achieve this in the '80s, corporations had to spend at least a half million dollars on a special room (one at each end of the transmission), production equipment, and expert techs to run the conference. Now, 3M (among other vendors) offers a solution for much less. 3M's VCS3000 is a small eye-like camera with good quality voice pickup that tracks participants as they contribute to a meeting.

Videoconferences used to "feel artificial" to participants. People who met for the first time via videoconference felt less liking and trust than they did when they met in person. Users say now that the whole experience seems easier, though not as comfortable as an in-person meeting. Still, when one considers the travel and down-time costs involved in sending all participants from all points of origin to a meeting at a common destination, the discomfort seems less important.

A very simple tool available to any computer owner is the Logitech Quickcam Express PC Camera, which, at \$30 (after \$20 rebate), offers 352x288 resolution, 30 frames per second, and 24-bit color (2001 price and specs). This small "eye" sits atop a monitor and can send visual images on line.

The videophones media reporters used beginning in March 2003 to report from the Middle East had cutting-edge digital technology. The images and sound moved via satellite; yet television viewers could clearly perceive the several-second time delay as the signal bounced earth-satellite-earth-satellite-earth (as many times as was necessary). The video image was clear when still or when movement was confined to a small area of the screen.

With motion in the background, however, often the reporter's face would become greatly distorted. Even at light-speed and the high bandwidth available for transmission by satellite, the medium can carry only so much signal at a time.

**Listserves** A spring 1998 estimate said there were about 85,000 mailing lists to which a person might subscribe. Topics? Anything imaginable. There's a directory of these mailing lists: [www.liszt.com](http://www.liszt.com). Be careful. You can be inundated with mail if you oversubscribe.

**Encryption** Many business files contain sensitive information that must move electronically among locations. Moving it usually entails using a carrier (phone lines, satellite, etc.) that the company does not control. Encryption -- that is, turning the information into a code that only the sender and the receiver (who each have a copy of the code's key) can understand -- can safeguard the information. Business persons can buy many kinds of encryption software that encode information. The result looks like garbled nonsense to anyone who does not have the key to decode it.

The more people use the internet and the WorldWide Web for communicating, buying and selling, and so on, the more important encryption becomes. Commerce on the Web will not reach its full potential until users can feel confident about security.

The U. S. government has been unwilling to allow encryption to which it does not have an access key. If legitimate businesses can encrypt, then so can terrorists, money launderers, tax evaders, and those who would be a threat to national security.

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**GIGO:** Garbage In, Garbage Out. It's still true that technology merely makes poor thinking more conspicuous. The following is only one of countless bloopers that have occurred because the user of a mail-merge program didn't think about the way components of a names list would combine with blanks in a message.

"Dear Mr. Pearson: Just return the Grand Prize winning sweepstakes number before August 12 and you'll be turning quite a few heads on the streets of Los Angeles as you roar down P.O. Box 3543 in your brand new sport coupe."

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**Electronic snooping at work:** A program called Little Brother tells the boss on you if you dial up game sites on the Web or punch up a game icon (solitaire, tetris) on the desktop. It "can monitor up to 1,000 users and block any sites the boss considers unproductive." The program Anti-Game finds and destroys games on local systems in 20 seconds. The typical game-player is a middle manager earning between \$40,000 and \$50,000 per year. "But the boss may be overreacting. Studies also show that employees who visit non-work-related Web sites more than make up for lost time by visiting job-related sites at home. And games help relieve stress and refresh tired minds." According to Emily Coleman, president of the market-research firm that studied time spent at work on computer games, "Anyone who's worried about this should manage robots." C.S., No more fun and games, *Kiplinger's*, July 1997, p. 14.

See also the article on computer forensics on the last two pages of this handout.

**From the company's point of view - Combating online work avoidance:** Employers can block sites with time-wasting or undesirable offerings such as pornography, downloadable centerfolds, and racist jokes. Blocking sites is time-consuming, though, because the Web is in constant change.

Other software can track a Web user's trail and record what sites he or she visits while at work. Some compare Web-surfing at work to the harmless practice of doodling while working on a hard problem. "Yet even those who favor a little cybergoofering admit it differs from scratch pads and telephones. It's visual, fast, almost limitless,

inefficient - and very seductive. 'You keep going and going, and before you know it, it's time to go home, says Joe McKee, the [Phoenix] Salt River Project's computer specialist in charge of Internet security.'"

Some companies are hurriedly writing policy on appropriate use of the Internet at work. Some track and spot-check which sites employees visit. Others just monitor "the heaviest Internet users, sending warning notes when appropriate - a policy that has curbed, although not eliminated, inappropriate use."

Maggie Jackson, "All in a Day's Work Avoidance? Companies Tackle Online Loafing," *Los Angeles Times*, 9-7-97, p. D5.

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## World Wide Web

Of all the computer-assisted technologies of the last 20 years, the Web has been the most surprising. In 1991 almost no one had heard of it. Now a high volume of business is transacted there.

A *Newsweek* piece (April 13, 1998, p. 14) gave these figures for how long it took specific technologies to **reach a quarter of the U.S. population**. Its source was the National Center for Policy Analysis.

Date	Invention	Years till Mass use	Date	Invention	Years till Mass use	Date	Invention	Years till Mass use
1873	Electricity	46	1906	Radio	22	1975	PC	16
1876	Telephone	35	1926	Television	26	1983	Mobile phone	13
1886	Gas automobile	55	1953	Microwave oven	30	1991	WorldWide Web	7

Electronic commerce in the U.S. amounted to \$1 billion in 1996 and \$20 billion in 1997 – a 2000 percent increase in one year. Growth since 1997 has accelerated. Computer users of all ages "surf the web" for purchases, for information, and for entertainment.

To do so, they use one or several "search engines." Yahoo is one of the most familiar, but there are many others. Google.com and Dogpile.com are search engines that search other search engines. Each search engine offers colorful interactive screens with easy-to-follow menus and other choices. On the Web people buy travel tickets (One vendor is travelocity.com – and another is expedia.com), books (www.amazon.com and www.barnesandnoble.com), downloadable software (thousands of vendors), and more. They buy education – hundreds of colleges and universities now have courses available online. They hunt for jobs and for employees at www.careerbuilder.com, www.careermart.com, www.careersite.com, www.espan.com, www.intellimatch.com, www.monsterboard.com, and www.4work.com. They can find updated figures on mortgage rates, get stock and mutual-fund quotes, and foreign exchange rates. They can even trace their family trees.

There is (as of 2002) no control on what individuals may post on the Web. Until early 1997 Website builders had to know "html" (hypertext markup language), but this is no longer necessary. Authoring tools such as Netscape's Page Composer make it easy to create one's own Website. Other page-design programs are AOLPress (downloadable free by anyone, not just by AOL subscribers), Adobe PageMill, and Microsoft FrontPage 98. Most Internet providers, that is, organizations that sell access to the Internet (such as AOL, Earthlink, and many others), give their customers 10 to 20 megabytes of space on their servers to use for a Website.

Online access providers offer subscribers a customizable start-up page and the opportunity to ask that specific kinds of available information be delivered automatically to them. This can save time for a Web searcher, but it also means gold for sellers – of information, services, and merchandise. Increasingly, when a user visits a commercial Website, a "cookie" is set. The cookie is a small file on the user's own computer that tells the vendor when the user visited the site. That information tells the vendor that the visitor has at least minor interest in what is being offered. Further "pitches" to this prospect might be sent. This and other kinds of customized information amount to "push" technology. "Pull," in contrast, suggests that the users go looking for the material themselves.

Most of the businesses and nonprofit organizations you've heard of have Websites. So do all kinds of "lunatic fringe" organizations. Although the results are not always pleasing, freedom of speech flourishes on the World Wide Web. There are lots of sites on UFOs and the paranormal, mostly baloney, but at least relatively harmless. But not all: Unfortunately quite a number of websites preach violence or other unlawful behavior, and it is not difficult to find websites posted by hate groups.

Plenty of con artists have "spun Webs" for the unwary. *U.S. News & World Report* (October 27, 1997, pp. 59-60) tells about assorted Web predators. One grifter, fighting multiple lawsuits at present, ran an illegal on-line raffle. Victims paid \$10 for a chance to win a Dodge Viper. He also got people to send him thousands of dollars on the promise that he would search out the car of their dreams at auto auctions. Crooks on the Web offer "pyramid schemes, chain letters, questionable business opportunities, bogus franchises, merchandise and services promised but not delivered, overpriced scholarship search services, work-at-home scams, and phony prizes and sweepstakes" (p. 59), not to mention miracle cures and home abortion kits. Law enforcement agencies are far behind the crooks.

Remember that **THERE IS NO FREE LUNCH.** Don't be a sucker. Deal only with legitimate sellers, and use only secure means of payment.

Contents of many Web pages change often because changing them is simple. Thus, unlike books and newspapers, what you find on the Web one day may not be there the next.

Libraries use the Web (along with many other computer-assisted information tools) increasingly. The online sources recommended by a library have generally been checked for reliability. The Web sources a person finds on his or her own need to be examined closely.

### **Hoaxes and Rumors at the Speed of Light**

Supposedly some bananas from Costa Rica were infected with flesh-eating bacteria. A secretary at UC Riverside received the message in January 2000 from who-knows-who and forwarded it to friends, who forwarded it to friends, who forwarded it to friends, and so on. Somehow the electronic signature of a UC Riverside staffer was on the e-mail, so it gained the credibility of that institution, though UC Riverside was nothing but an unwitting conduit. The story of the infected bananas was altogether untrue.

Your professor received a forwarded copy of this e-mail, doubted its veracity and did not send it on, and ceased thinking about it because she dislikes bananas – but was amused to see the hoax unmasked in the newspaper in mid-February 2000.

A report sped throughout the country via computer in 1999 that the U. S. Postal Service intended to place a 5-cent surcharge on all e-mail messages. This surcharge would supposedly have been required by House Bill 602P, which was authored by a Republican Congressman named Tony Schnell and vigorously opposed by an indignant Virginia lawyer. The prankster who invented the hoax has still not surfaced. The Post Office said they would never support such a notion and posted a notice to that effect on the U.S.P.S. website and may do so again, since they are still receiving protests and complaints.

Still another, from 1997: "Hundreds of thousands of letters, many bearing birth certificates, baptism credentials and even Social Security cards, have been piling up for a defunct post-office box in Minnesota. They're coming in response to a notice, posted via e-mail, that as part of a lawsuit settlement, Gerber Products Co. was handing out \$500 savings bonds to any child born between 1985 and 1997. To obtain the bond, the notice said, all consumers had to do was send a copy of the child's birth certificate and Social Security card to P. O. Box 162 in Minneapolis.

"Like many rumors, the story had a shred of truth to it. There was a class-action suit settled against several baby-formula makers last fall (though Gerber wasn't among them). And small refunds were available to parents in some states, if they sent a letter to the same post-office box in Minneapolis. But the rest of the story is false, as Gerber, a unit of Novartis AG, has been telling the thousands of callers to its consumer hot line.

"That hasn't stopped the message from being spread electronically from Atlanta to Alaska. 'You are all friends with children who I believe are within the qualifying ages. good luck. liz,' read one e-mail epistle circulating the notice.

Especially when forwarded from someone known and trusted, the message "seems true" to recipients who would never fall for a chain letter. They forward it.

"Once people find out there is no \$500 savings bond, they fear the worst, leading to new cyber rumors: that it was a scam to harvest Social Security cards that will be sold for everything from green cards for illegal aliens to unlimited credit lines.

"But that's also not true. The Minneapolis post office has closed that post-office box and is returning the mail to senders. Letters without a return address are shredded. Now, postal authorities there are simply hoping for relief from the 2,000 or so letters that keep rolling in every day." Quick, Rebecca. "Pssst: Not Everything You Read In Cyberspace Is True. Pass It On." *Wall Street Journal*, October 21, 1997, p. B1.

Be wary of believing the improbable story that comes to you via e-mail or web. Get on Google.com and key in the word *hoaxes*. You'll see numerous websites that investigate and debunk the nonsense.

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Byron, Ellen. (2003, March 18). Computer forensics sleuths help find fraud. Wall Street Journal, B1, B8.

On a weekend afternoon, two people dressed as repairmen entered the closed offices of a luxury-goods retailer. Working quickly with a digital camera, they photographed the tops of the desks belonging to three employees. Then they copied the hard drive on each worker's PC. Using the digital photos as a guide, the pair made sure they hadn't disturbed anything on the desks. Mission accomplished, they hurried back to Deloitte & Touche's New York forensics lab.

A scene in an upcoming James Bond movie? Hardly. The retailer had hired the two experts to search the computers of three employees suspected of stealing corporate secrets and client information and feeding it to a departed executive.

With just 20 key words supplied by the retailer, the technicians recovered plenty of smoking guns. Deleted e-mails and America Online instant messages confirmed the company's suspicions. By tracing the employees' movements through the company computer network, the experts also showed that the suspects had sent confidential information to the former executive using an AOL account. Civil litigation over the theft is pending.

Corporate investigations used to mean following a paper trail, but these days many follow an electronic one. Increasing demand for the skill and technology necessary to unearth digital secrets has led to the birth of a small but growing industry: computer forensics.

Computer-forensics experts, who often have a background in law enforcement, computer technology or both, can determine the last time a computer was turned

on, and when a document was created, reworked and printed. They can dig up e-mail and documents that seemingly have been deleted, determine what Web sites were visited and which key words were used to get there.

While some skilled computer-room techies may be able to perform similar tasks, the computer forensics experts bring an added benefit: They are outsiders. That may make them more credible in the eyes of a judge or jury.

"If you do the work in-house, you have a vested interest in the evidence you find," says Bob Gomes, president of RenewData, an Austin, Texas, forensics firm with 30 employees. "How does a court know it wasn't altered? A good opposing counsel will do a lot with that."

Also, since they are trained in legal technicalities, the forensics experts are more adept at maintaining proof of the evidence's chain of custody documenting when, how and by whom the evidence was gathered and analyzed. Such factors are crucial to ensuring the evidence will be admitted in court.

As electronic evidence continues to take a more prominent role in litigation, computer-forensic firms are expanding. The industry is made up mainly of players from three areas: accounting-forensic units of big accounting firms, data-recovery and computer-repair specialists, and litigation-support services.

"Within three years, I'm sure almost all evidence collected in discovery will be electronic-based," says Joan Feldman, president of Computer Forensics Inc. of Seattle. "We're now staffed seven days a week, 18 hours

a day just to keep up with /p.B8/ clients' court schedules." Her company, which she founded nine years ago, now has two offices and 11 employees.

Deloitte & Touche LLP went into the computer-forensics business five years ago and operates eight labs, employing 100 specialists in the US. Clients include financial-services and technology firms, retailers and government agencies.

"People say things in e-mail they'd otherwise never write, and probably never say," says Simon Platt, who oversees the accounting firm's national forensics unit. "And once it's written, copies can be found everywhere."

Mr. Platt attributes the industry's growth to the recent awareness by courts and law-enforcement officials of the importance of electronic documents. He points to New York Attorney General Eliot Spitzer's investigation of former Salomon Smith Barney analyst Jack Grubman, which heavily relied on e-mails.

None of this expertise comes cheap. Most firms charge \$250 to \$500 an hour, depending on the tasks' complexity and volume of records examined. Flat fees are often negotiated for long-term projects.

Computer-forensics work usually begins with an expert making bit-by-bit duplicates of the digital stuff on a hard drive (analysis is conducted on copies so that original evidence isn't disrupted). Experts sometimes can replicate an employee's hard drive just by plugging into a company's network, and can even track an employee's offline movements as he or she makes them.

Verifying the authenticity of electronic evidence is usually the next step. Experts are often called to testify in court about the methods used to retrieve information. Such proof is important in defending against tampering accusations, which often arise in cases involving electronic records.

A case involving a large defense contractor in the Washington, D.C., area is typical. In November, the company contacted RenewData. The defense company had just fired an employee and had reason to believe that after the termination he copied some sensitive files from his workstation and two servers to floppy disks, and then deleted them. The company didn't know what the employee had taken nor what he had deleted.

RenewData technicians told the company to stop using the computer and two servers that held the network files. Then, a forensic expert flew to Washington to take forensic images of each of the drives involved. Back in the lab in Austin, technicians were able to retrieve logs that documented the employee in question deleting files. They also were able to restore the deleted files. The former employee, when faced with this evidence, admitted his guilt and reached a settlement with the company out of court.

"We see a lot of cases like this," says Mr. Gomes, the RenewData president. "When people are faced with such incriminating electronic evidence, usually they settle very quickly."

What can make electronic evidence potent is that it is sometimes the only proof of wrongdoing. In 2000, the National Oceanic and Atmospheric Administration, a federal agency, suspected that a Russian ship fishing in Russian waters was exceeding international crab-fishing quotas and violating the Lacey Act, which prohibits illegal movement of natural resources into the U.S. The crabs were being sold in the US using falsified customs declarations, officials believed.

Search warrant in hand, NOAA officers brought technicians from a computer-forensics firm aboard the vessel to make a replica of the ship's computer systems. Analysis of the vessel's global-positioning system and electronic logs determined the ship's exact location on specific dates, its speed through certain depths, activity of its nets and the volume of crab brought aboard. Recovered communication between the ship and the company that owned it revealed that management knew of the ship's activity.

Based on this, agents were able to piece together evidence that the agency says shows the crew and its owners had broken the law. The head of the fishing company is facing criminal charges in Russia and may be prosecuted in the US, as well.

"In this case we didn't have Coast Guard photos; we had to rely strictly on electronic data," says Brad Vinish, an NOAA deputy special agent in charge. "This ability has revolutionized how we're doing some investigations."