

yes

Making The Internet Work For You

By Tim McCollum

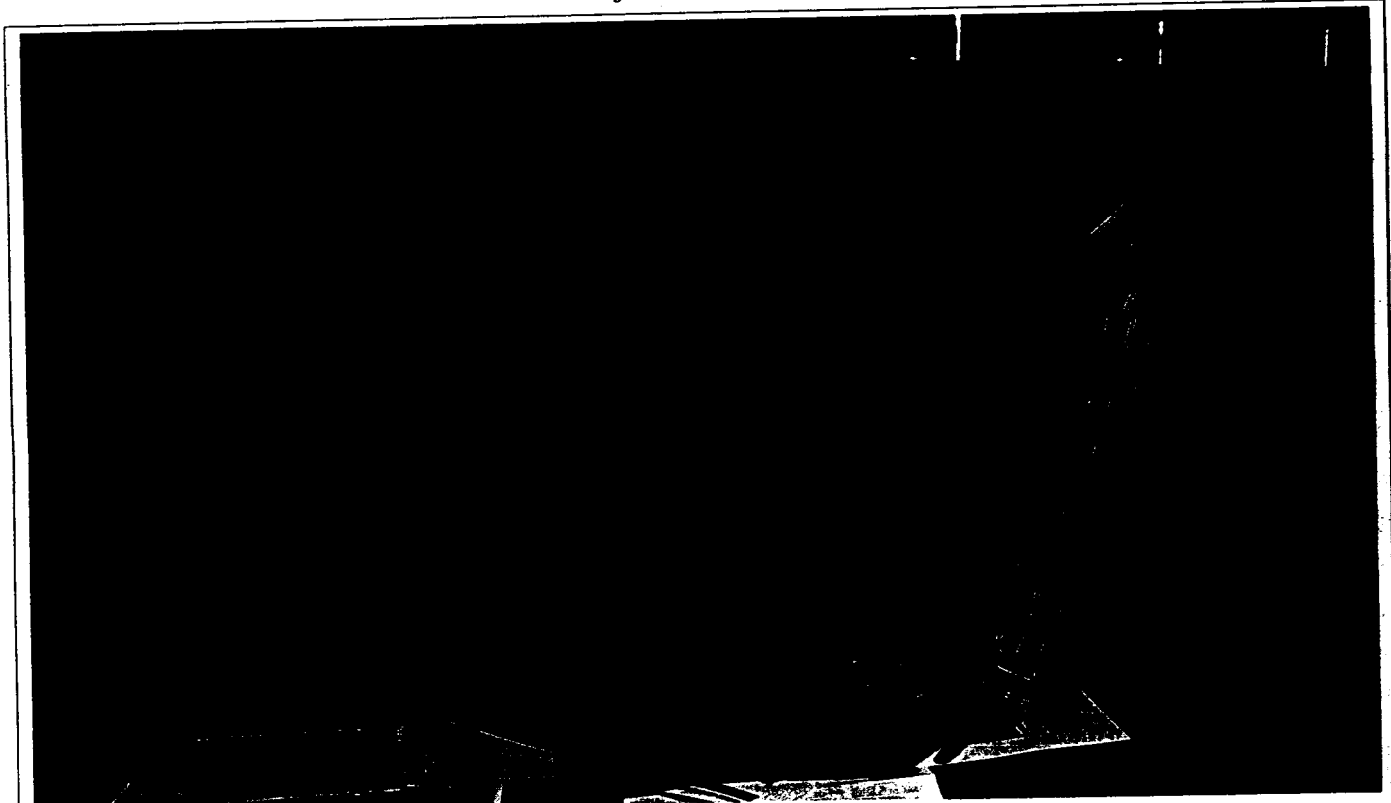


PHOTO: GUNDA SUE SCOTT

The Internet has revolutionized the way A&a Printers and Digital Graphics in Menlo Park, Calif., and many of its customers do business.

Three years ago, before A&a established a business presence on the global computer network, all customers used to interact by phone, by mail, and on a walk-in basis with the small commercial printer.

Today, customers with computers and modems dial in to A&a's site on the part of the Internet known as the World Wide Web to place orders, track the status of their projects, make revisions to those projects, and submit questions via electronic mail.

Moreover, A&a's paper broker checks the company's production schedule daily via the Internet to determine the quantity and types of paper that will be needed for the next day's work. Consequently, A&a does

Communications between customers of A&a Printers and account representatives K. Michael Riley, right, and Michelle Reynolds-Silva have improved thanks to the company's Web site, says Robert Hu, president.

not have to order paper by phone or store large quantities on site.

In all, the Internet has significantly streamlined the way A&a does business while increasing customer service and satisfaction, according to the company's president, Robert Hu. "Printing and publishing have always been a collaborative function," he says. "We saw the Internet as an opportunity to link them together."

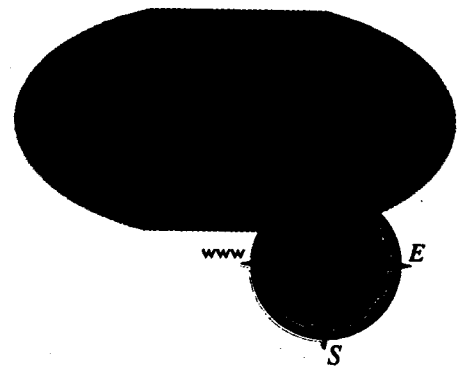
A&a was in the initial wave of companies that set up a presence on the Web in

1993. Hu had been looking for a way to give his customers greater involvement in their print jobs; the Web site seemed a natural solution because it would give computerized clients fast and easy access to A&a's document-management system.

Hu says that the business decisions that the clients' editors, designers, and managers and A&a's 20-person staff once made only after swapping telephone calls and visiting A&a's printing plant are now made with the help of the Web site and e-mail. Clients can post messages and make revisions to documents on line, and the site's computer software automatically and invisibly logs what changes are made and by whom.

According to Hu, the Web site (www.aaprint.com) allows clients to use A&a's services if it were their in-house printing depart-

The global computer network has sparked a gold rush for the 1990s. Businesses that don't catch the fever may be left in the dust.



ment—rather than an outside contractor. Hu says he hopes to use it eventually as a mechanism for teaming with other vendors to provide a wider range of publishing and printing services and resources for customers.

"We've never looked at the Web to solicit business but to improve business with our existing customers," says Hu, even though the company has attracted new customers with its Web site.

By emerging as a finalist in a recent national competition for Internet innovators, A&a established itself among the small companies at the forefront in making the Internet an effective business tool. These businesses are leveraging the Internet to improve productivity, communications, and customer service; to market products and services; and to obtain information.

"Companies can use it to do a lot of things that they probably were spending more money to do some other way," says Mary J. Cronin, a professor of management at Boston College and the author of *Doing More Business on the Internet: How the Electronic Highway Is Transforming American Companies* (Van Nostrand Reinhold, \$29.95). "At the same time, it opens up new opportunities that they otherwise wouldn't have had."

Cronin says the Internet is creating opportunities for new and existing companies. Many of its early success stories, she notes, have involved small companies nimble and entrepreneurial enough to set sail in its largely uncharted waters.

A Change in Attitudes

Nonetheless, small business generally has been slow to tap into the Internet. In fact, a recent survey by HW Research Services of Dallas suggests that many entrepreneurs still aren't convinced that the Internet offers any tangible benefits for their companies. However, a recently updated survey by George S. May International Co., a management consulting firm in Park Ridge, Ill., indicates a great change in the attitudes of small-business owners toward the Internet. More than 45 percent of small companies

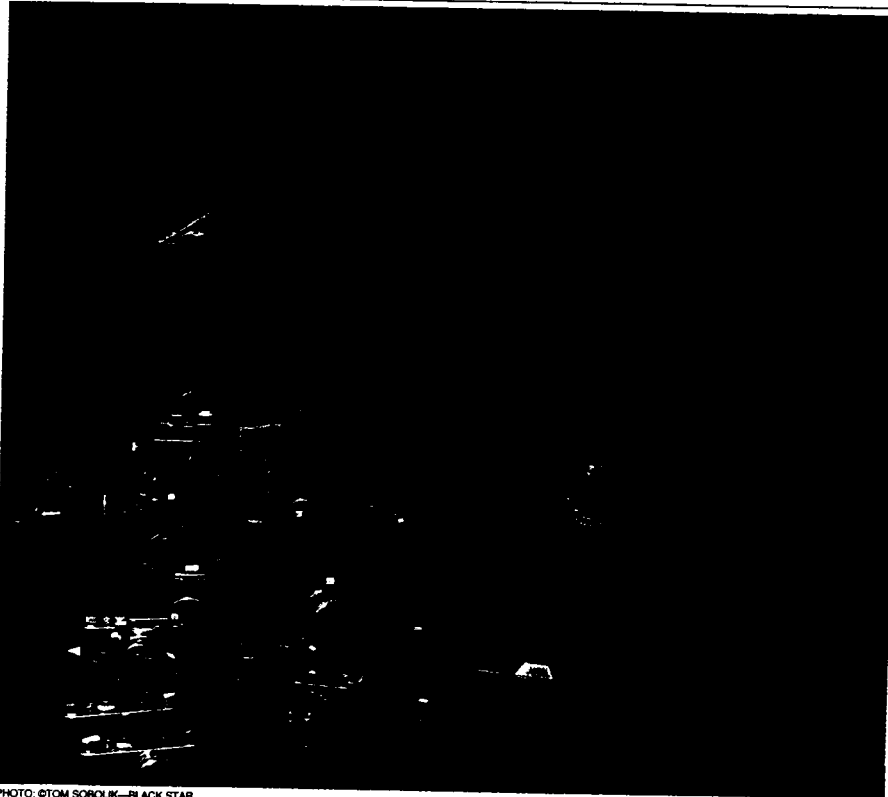


PHOTO: ©TOM SOBOLIK—BLACK STAR

An on-line catalog is producing about 10 percent of sales for the owners of Woodmere Camera, Richard Tillis and his father, Eddie.

surveyed in January said they were using the Internet, up from 19 percent just 10 months earlier.

Other evidence suggests that small companies, no matter what their industry, can no longer afford to ignore the Internet, mainly because their customers and trading partners may want them to use it and because their competitors may already be taking advantage of it.

"It's important to be on the Internet now," says Daniel Dern, an Internet consultant in Newton Centre, Mass., and the author of *The Internet Guide for New Users* (McGraw-Hill, \$27.95). "It's like getting a phone and making sure there's a [greeting]

on your answering machine. You should at least have a couple of people who know how to access the Internet."

Personal and business use of the Internet has taken off in the past four years. A New York City technology-research firm, Find/SVP, estimates that 37.8 million adults in the United States—business people and other members of the public—have access to the Internet. That is double the number of only a year ago.

The number of companies doing business on line is also growing. According to Network Solutions Inc. of Herndon, Va., which registers domain names—Internet addresses—in the United States under a

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contract with the National Science Foundation, there are already more than 600,000 commercial domains, up from 236,000 in February 1996. They make up 89.3 percent of the domains registered by the company.

Forrester Research in Cambridge, Mass., estimates that Internet-related commerce will approach \$200 billion in 2000, up from \$15 billion in 1996. Business-to-business commerce accounted for 4 percent of the 1996 total but is expected to climb to 33 percent by 2000.

The New Electronic World Order

The Internet hasn't always been friendly to business. Launched in 1969 by the U.S. Department of Defense, the Internet was intended to link universities with government research facilities, allowing researchers in various locations to communicate and exchange documents and other information by computer. The Internet quickly spread worldwide, becoming a super network



PHOTO: BARRY STAVER

Insurance agent *Doreen O'Donovan offers clients an on-line source of coverage information in addition to personal meetings.*

consisting of many lesser networks.

Throughout the 1970s and '80s, the Internet and business were incompatible notions, with violators of the Net's non-commercial culture greeted with vitriolic e-mail known as "flames." (See the story on

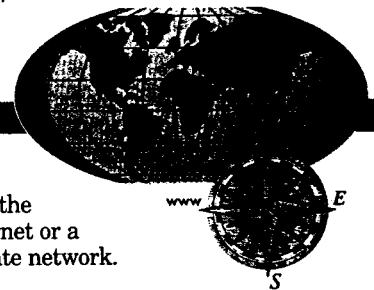
Internet etiquette on Page 13.) The Internet began to open up to business about three years ago, as companies and individuals became increasingly interested in using their computers to communicate.

Commercial Internet service providers (ISPs) significantly relaxed the rules against commercial activity on their networks, making the Internet more hospitable to business. Old-guard users grumbled but were soon outnumbered by business and individual users who accessed the Internet via ISPs and on-line services.

One thing almost all new users discover quickly is that the Internet isn't a monolithic, single-purpose network but a vast matrix of networks supporting a multitude of applications such as:

- Electronic mail, or e-mail, which allows people to send messages by computer to others on the Internet.

- Discussion areas—newsgroups, bulletin boards, "chat" areas, and mailing lists—which allow people with common interests to discuss issues and exchange ideas.



The On-Line Lexicon

The Internet has spawned its own vocabulary combining technical devices and user jargon.

Following are some of the terms that you're sure to encounter if you use the Internet. Many of them are used in this issue of *Nation's Business*.

Backbone: The main international telecommunications networks that carry Internet traffic among other national, regional, and local networks.

Bandwidth: The amount of data that can travel in a given time, usually one second, across a network or a connection to a network such as a modem.

Browser: Software that allows a user to navigate the World Wide Web by clicking with a mouse on underlined text and graphical objects similar to those found in the Microsoft Windows and Apple Macintosh operating systems.

Client: A personal computer attached to any network, including the Internet. Also, personal-computer software that gives access to, and enables use of, the Internet, either by modem connection or by connec-

tion to a local area network and related hardware.

Cyberspace: A popular term encompassing all computer networks, including the Internet, on-line services, and private networks.

Domain name: An Internet address, commonly in the generic form *company.com*. Six types of domain names are currently used in the United States: .com for businesses, .edu for educational institutions, .gov for government agencies, .mil for the military, .net for networks, and .org for organizations.

Download: Bringing data from the Internet into a personal computer.

EDI: Electronic data interchange. It allows companies to place orders, bid on projects, and make payments over the Internet or private networks.

Electronic commerce: Conducting sales or other business transactions over the Internet or private networks.

E-mail: Electronic mail. A message sent from one person to one or more other per-

sons over the Internet or a private network.

E-mail address: An electronic location for receiving and sending e-mail. E-mail addresses are used to identify and contact users. They take the form: *username@company.com*.

FAQ: Frequently asked questions. A list of common questions about a particular subject such as a newsgroup or a Web site.

Firewall: Computer hardware and software that prevents Internet users from accessing part or all of a private computer network that is attached to the Internet.

Flame: An angry e-mail message or newsgroup posting.

FTP: File transfer protocol. A software protocol that allows people to copy or move files from a remote computer—called an FTP site—to their own computers over the Internet.

HTML: Hypertext markup language. The software language used to create World Wide Web pages.

HTTP: Hypertext transfer protocol. A

- File libraries, known as FTP sites, where people can retrieve documents and software.

- The World Wide Web, the graphical portion of the Internet that allows people to locate and view documents containing text, graphics, video, and sound with a few well-placed clicks of a mouse.

An Image Enhancement

Some of the obvious winners in the current Internet mania are companies that have been able to generate sales over the World Wide Web—companies such as Woodmere Camera in Lynbrook, N.Y.

Woodmere, a rare-camera dealer, began selling through its Web site (www.woodcam.com) two years ago. The Internet provided the family-owned business a new way to serve its highly specialized clientele.

Before establishing its Web site, Woodmere took orders from customers worldwide by phone and mail. Now customers can shop through the company's on-line catalog, request information by e-mail, and place orders by filling out an electronic form.

Richard Tillis, co-owner of the firm with his father, Eddie, says the Web site has



PHOTO: PAUL SERO

The speed and reach of e-mail attracted China Mist Tea's president, John Martinson, to the Internet.

helped enhance Woodmere's reputation among aficionados worldwide as a source for hard-to-find cameras.

"Our business is very right for the Internet," says Tillis. "It's not like we're selling something that people can get anywhere. Most of our business is interna-

tional. The Internet is a great way for [customers] to communicate with us for the cost of a local call."

When Woodmere launched its Web site, only a small number of firms were selling products on line. A local software consultant, Shimon Lichtman, set up Woodmere's Web site and order-processing system and hooked it up with an on-line mall called Business1.com. The mall is managed by SBT Corp., a San Rafael, Calif., firm whose server computers store the Web sites of Woodmere and other on-line "tenants."

Tillis began to advertise his site in the camera-collecting magazine *Shutterbug*, through fliers he sent to people on Woodmere's mailing list, and through placement on Internet search engines and directories such as Lycos, WebCrawler, and Yahoo,

which allow users to search for specific content by key words or phrases.

So far, Tillis says, sales from the Web site make up about 10 percent of the company's revenues. Many visitors to the site are seriously looking to buy. "For every 10 [e-mail] messages I get, two or three are

communications protocol that allows people to navigate among documents or pages linked by hypertext and to download pages from the World Wide Web.

Hypertext: A software format that lets users embed into documents the links to other documents. It also allows multiple documents to be represented by one page.

Internet: A global network of computer networks that allows people to send e-mail, participate in discussions, and access information.

ISP: Internet service provider. A company that sells access to the Internet to businesses and individuals. Also called an Internet access provider.

Intranet: A private network within a company or organization that may allow users to connect to the Internet but limits access from the Internet.

IP address: Internet protocol address. This identifies a particular computer on the Internet.

ISDN: Integrated services digital network. A high-speed communications system that allows people to connect to the Internet and to send and receive data in digital form over telephone lines using a

device called a terminal adapter. Unlike modems, ISDN does not require computer data to be converted into analog voice signals. ISDN can transfer data at speeds of up to 128 kilobits per second.

Java: A software language that allows people to build interactive Web sites.

Link: A hypertext code that allows people to move from one document to another by clicking on the link with a mouse.

List: Observing the activities of a discussion group such as a newsgroup, chat room, or mailing list before posting messages.

Mailing list: Similar to newsgroups (see below), mailing lists allow people to discuss common interests by posting messages, which are received by everyone in the group. Unlike newsgroups, people must subscribe to a mailing list to post and receive messages. Also called a listserv.

Modem: A device that allows a computer to connect to the Internet over phone lines.

Network: A group of computers linked by a common communications protocol.

Newsgroup: One of more than 10,000 discussion groups on the Internet where people with similar interests can post mes-

sages. Also called Usenet groups.

On line: The generic term for the Internet and on-line services.

On-line service: Services such as America Online, CompuServe, the Microsoft Network, and Prodigy that provide members Internet access, e-mail, discussion areas, and information.

Search sites: World Wide Web sites that allow users to search for specific content by key words or phrases. Popular search sites—some are search engines, others are Web directories—include AltaVista, Excite, Lycos, WebCrawler, and Yahoo.

Server: A computer that people dial into by modem or over a network to gain access to the Internet. A server is also used to host Web, FTP, and chat sites.

Secured server: A server using software that protects the privacy of electronic transactions conducted over the Internet.

URL: Uniform resource locator. The location or address of a Web page; an example could be <http://www.company.com>.

World Wide Web: The matrix of graphical information stored on servers connected to the Internet.

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orders, and three or four are probable orders. My batting average is pretty good."

Woodmere is typical of small companies that have devoted time, energy, and money to establishing a full-scale presence on the Web. The top motivating factors for most of these companies are improved sales and marketing, according to a survey conducted by International Data Group, a technology publishing and research company in Boston, and by Intelliquest, a technology research company in Austin, Texas.

But selling to the masses remains an elusive goal for many companies, small and large. Forrester Research reports that retail sales over the Internet totaled just \$530 million in 1996, or about 4 percent of total Internet-related commerce. Although the firm expects retail sales will still be at 4 percent by 2000, it forecasts that total Internet commerce will increase 13 times over by that time.

One-third of current Web users make purchases on line, according to International Data Corp., a research firm in Framingham, Mass. Researchers expect Internet sales to increase dramatically as more people gain access to the computer network.

Security Concerns

The future of Internet commerce nonetheless faces some significant obstacles. Most

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—Insurance Agency Owner
Doreen O'Donovan

consumers, for example, still do not use the Internet, and most of those who do are wary of making purchases over it.

Technology executives say that sending a credit-card number over the Internet is no less secure than handing it to a waiter in a restaurant. Yet market research shows that most consumers want greater assurance that the Web is secure before they submit their credit-card numbers to on-line merchants.

"The security of electronic commerce is in its infancy right now," says Dick Peck,

vice president of business development for O'Reilly & Associates Inc., a publishing and research firm in Sebastopol, Calif. O'Reilly recently released a study that showed that only about 3,000 Web sites had the mechanisms in place for conducting on-line sales securely.

Although mass consumer sales on the Internet may be yet to come, many small companies are taking the path traveled by A&A Printers and using the Internet to market their companies and improve customer service.

A Fourth Channel

Forrester analyst Julie Meringer says the Internet provides a "fourth channel" for reaching customers, along with the telephone, mail, and face-to-face contact.

But to compete effectively with the more than 600,000 Web sites, companies must constantly ensure that the information on their sites is fresh, useful, and compelling. They must also respond quickly to customer inquiries. Otherwise, people won't return to their sites.

Insurance agent Doreen O'Donovan is among the entrepreneurs using the Web to promote their businesses. The owner of the D O'Donovan Agency in Boulder, Colo., O'Donovan believes the Web site she established last summer to communicate with

Exploring The Internet

The best way for entrepreneurs to discover the vast potential of the Internet is to log on and poke around. These functions are easy, and it doesn't require a big investment of money or time to get a general idea of the Internet's content and capabilities.

You'll need a computer, a modem, and an account with an on-line service or an Internet service provider (ISP).

On-line services such as America Online, CompuServe, the Microsoft Network, and Prodigy give users access to Internet services—the World Wide Web, electronic mail, newsgroups, and file libraries (or FTP sites) where documents and software can be retrieved. The services offer additional content available only to subscribers.

ISPs specialize in providing Internet access. They range in size from large national companies such as AT&T, GTE, and MCI to small, local firms. ISPs sell direct access to Internet services and generally lack proprietary content.

Making sense of the choices can be difficult. Here are some questions to ask before you sign up.

How much does Internet access cost? The price varies. Entry-level rates designed to appeal to light users generally provide three to five hours of access a month for less than \$10, plus an hourly fee for any additional time. Unlimited-access accounts typically cost a flat rate of about \$20 a month. In addition, some ISPs—but not on-line services—charge users a fee for setting up an account and for any software provided.

Does the ISP or the on-line service provide high-speed modem access? Most new modems send data at up to 28.8 or 33.6 kilobits per second. Anything slower can be frustrating. Faster 56-Kbps modems are just beginning to reach store shelves, and many ISPs support ISDN connections, which use telephone lines and a device called a terminal adapter to transfer data at speeds up to 128 Kbps.

In how many cities does the provider or service have local Internet-access phone numbers? Frequent travelers will want a service that offers either toll-free or local-dial ac-

cess in areas they are likely to visit, to avoid long-distance charges.

Does the provider or service offer telephone support? New users are likely to have questions and problems when they try to install software or set up a modem before getting on line. Many providers encourage users to seek help by e-mail or through a frequently asked questions (FAQ) list, but more-capable ISPs will offer phone support.

Is the provider or service dependable? Find out how long it has been in business, how many customers it has, the speed of its connections to the Internet's network backbone, and the number of simultaneous callers its network can support. Internet providers of all sizes are struggling to keep up with rapidly increasing demand for Internet access, which can lead to slow networks, busy signals, and disconnections.

Does the provider or service want a long-term commitment? Many ISPs and on-line services offer lower rates if a customer agrees to a service contract of one year or longer. That leaves little recourse for a dissatisfied customer.

current and potential customers will help consumers become better informed about insurance coverage without dealing with an agent directly.

The site www.indra.com/us/fo/ara includes O'Donovan's newsletter and explains different types of insurance policies she offers from American Family Insurance. Visitors to the site can send O'Donovan questions by e-mail and request quotes on automobile, home, and life insurance.

"It's a perfect way to explain things," O'Donovan says. "If they want a little bit of information, they can read it on the main screen. And if they want something in-depth, they can go further."

From the beginning, O'Donovan's Web site has been a personal endeavor. She first explored the Internet at a public-access terminal at the Boulder Public Library. At the time, she found only a dozen insurance companies on the Web. A month later, there were more than 100.

Sensing an opportunity to market her firm and become a resource, O'Donovan contracted with a local ISP, Indra's Net Inc., to host her Web site on its servers. Then she set about designing the site herself. A computer novice, she spent weekends and evenings writing her own code in hypertext markup language (HTML), the format that makes documents accessible on the Web.

Although O'Donovan's Web site has been visited by Internet users from as far away as France, her main goal is to improve service for people in Boulder and the surrounding area.

"Once more customers are used to the Web, I think it will help customer service," she says. "It will be great because it will eliminate telephone tag and put information in writing."

Many companies base the effectiveness of their site simply on the number of people who have visited it, which is recorded by the site's server software. But knowing the number of visitors doesn't tell these companies much about their users.

More information can be obtained now with new Web-server software from vendors such as Microsoft Corp. and Netscape Communications Corp. that allows a company to track what people do on its site and trace how these people found it.

For \$200 to \$3,000 a month, entrepreneurs can also contract with services such as Nielsen-I Pro (212-708-7714) and

Netcount LLC-Price Waterhouse (213-848-5700), which can measure the effectiveness of on-line advertisements based on the number of times visitors click on a site using a mouse.

The Power Of Communications

Indeed, communications capabilities, such



PHOTO: WHEATSTENBERG-BLACK/STOCK

Making bids and fulfilling orders became easier thanks to the Internet, says Richard Wilson of Matrix Tool.

as those pursued by O'Donovan, are the Internet's greatest strengths, and e-mail is its most basic and useful component.

"It's the most popular on-line activity," confirms Kate Delhagen, an analyst with Forrester Research. "It's easy to use, and it's open 24 hours a day." Forrester predicts that within five years, 50 percent of the U.S. population, or about 135 million people, will communicate regularly via e-mail, up from 15 percent now and just 2 percent in 1992.

For many companies, e-mail is becoming more efficient and economical than postal mail, faxes, and phone messaging as a means of reaching employees and customers alike. Businesses can send messages instantly to people anywhere in the world using e-mail, and they can send entire documents as attachments to their e-mail, saving paper and postal costs.

Companies can also provide automatic e-mail responses to customer requests and questions.

"Electronic mail lets you send everything from one-line messages to spreadsheets and sales updates quickly," says Internet consultant Dern, who concurs that e-mail can save money and time.

Moreover, Dern says, e-mail is relatively inexpensive to install. Many companies can start with a simple dial-up account with an on-line service or ISP for less than \$20 a month. Such an account enables them to use their computers and modems to connect with the service.

Improving communications was what attracted John S. Martinson, president of China Mist Tea Co. in Scottsdale, Ariz., to the Internet. Martinson was looking for a better way to exchange information with customers, employees, and attorneys. Internet e-mail offered an easy means for the tea distributor to reach all three, so China Mist hired GlobalCenter Inc., an ISP in Sunnyvale, Calif., to connect its company network to the global network.

What Martinson didn't expect was the quick payoff in cost savings and increased productivity that e-mail would bring. China Mist's attorneys charge the company a lower fee now because it uses e-mail to communicate and exchange documents.

And Martinson and his salespeople can keep in touch with the home office while they are on the road—an improvement over phone calls and faxes, he says. "With e-mail you can send copies of documents and do a lot more that you can't do with faxes and voice mail. You can get e-mail anywhere."

In fact, Martinson says e-mail has become the quickest and easiest way to get in touch with him. He says using e-mail is less trouble than drafting formal letters and addressing envelopes. And it's as easy to send a message to several people as it is to one person.

So far, China Mist has been careful about using the Internet for marketing. The company only recently got a Web site (www.chinamist.com) up and running to provide information to customers.

While using e-mail to target new customers may seem tempting, Martinson is wary of it. "I hate getting junk e-mail," he says. "I like getting e-mail from people I've established a relationship with. Junk e-mail's just the same old stuff in a different form."

Martinson is right to be concerned. Generally, companies that have attempted to use e-mail as a mass-market-



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ing technique have been greeted with scorn by Internet users.

Three years ago, an Arizona law firm posted an advertisement on all of the more than 10,000 Internet newsgroups, discussion areas where people with similar interests post messages. The response was instant, with angry users bombarding the company's e-mail box with flames. The deluge shut down the server of the firm's ISP, which immediately deactivated the firm's account.

More recently, America Online, an on-line service based in Dulles, Va., blocked messages from a Pennsylvania company that attempted to send e-mail advertisements to all of the service's users. The Pennsylvania company sued, but in November a federal District Court in Philadelphia ruled that AOL had not violated the company's free-speech rights.

E-mail, newsgroups, and the Web are proving to be excellent resources for finding business opportunities and generating sales leads, even though overt direct marketing hasn't been accepted by many users of the Internet.

Information Exchange: A Two-Way Street

China Mist's Martinson has discovered that the Internet can be a valuable research tool. It has proved to be especially helpful for keeping up with developments in the restaurant industry.

China Mist distributes its products to restaurants throughout the United States. While few of its customers are on the Net, Martinson says a number of Web sites provide information about restaurant industry trends and issues and about the company's competitors.

The Internet has become an electronic library, one that can give companies a tangible business advantage. News resources—including magazines, newspapers, wire services, and television networks such as CNN—abound on the Net, offering quick access to the latest national, world, business, and financial news from leading sources.

Business-information sites such as BizWeb and the Home Financial Network Inc. provide business news and advice plus links to other helpful resources. Industry associations and trade organizations have begun to offer information on line to companies. Much of the information is provided free or at a low cost.

Entrepreneurs can use the Internet to find leads to business opportunities, including sales prospects, trading partners, and sources of products and services. Moreover, they can gather a wealth of intelligence

about their industry and their competitors.

"We find the Internet is a great place to find out information about our customers, information that we'd ordinarily have to wait for," says Peter A. Lehrman, president of Emerging Technology Search Inc. (ETS), a job-placement firm in Roswell, Ga. "It's really a door for us to see a lot of companies and find all sorts of information."

Last summer, Lehrman was looking for

in the first three months from people we found on the Web."

Business-To-Business Connections

Finding job candidates isn't the only reason ETS uses the Internet. Many of the company's clients are technology companies or information-technology professionals employed by large corporations, who Lehrman says prefer to communicate electronically.

Other small companies are finding that their large corporate customers want them to do business electronically. Over the past decade, companies such as Chrysler Corp., General Electric Co., and Wal-Mart Inc., along with the federal government and many banks, have asked or ordered their trading partners to use computer-network links to process orders, bid on jobs, and make payments.

This information processing, called electronic data interchange (EDI), automates financial transactions among buyers, sellers, and financial institutions and gives the final customer greater control over the manufacturing process.

For many small companies, though, EDI has been too expensive to implement because it requires a significant investment in new computer hardware and software, plus a subscription to a private network that links the company to its customers.

New developments, however, are making EDI less expensive. In the past year, EDI network operators such as GE Information Services (GEIS), Harbinger Corp., and IBM Global Services and new players such as Industry.net, a three-year-old service from Nets Inc. in Cambridge, Mass., have rolled out systems that bring electronic commerce

to the Internet. The systems allow small businesses to connect via the Internet to new and existing trading partners around the globe at a fraction of the cost of EDI over a private computer network.

Companies can now track inventory and carry out transactions over the Internet, says Steve Raber, vice president of network-computing solutions for IBM Global Services. "EDI has been good, but this will explode by orders of magnitude."

That's good news for Matrix Tool and Machine Inc., a 25-employee contract manufacturer in Mentor, Ohio. Matrix makes parts for lighting fixtures and had been trading with its largest customer, GE Lighting, over a dial-up private network for seven years.

A year ago, GE Lighting invited the com-



PHOTO: MICHAEL SCHWARZ

Market research is conducted on the Internet by Emerging Technology Service's president, Peter A. Lehrman, center, and employees Paul Lipman, left, and Horatious Harris.

a better way to locate qualified software engineers and programmers to work for client companies in the Southeast. At the time, ETS found potential job candidates through cold calls and ads in newspapers. The Internet seemed like an ideal place to find people, Lehrman says. "Our prospects use the Internet. That's why we need to be out there for them."

Lehrman started with a basic Web site (www.harb.net/ETS) that posted available jobs and instructed interested people to call ETS or send a resume. But rather than wait for candidates to come to him, Lehrman set out on the on-line equivalent of going "door to door" to find leads to potential candidates and new clients and to locate other Web sites that could channel prospects to ETS.

His search led him to the Web pages of university placement offices, area companies, software-industry associations, and computer groups. Lehrman says it didn't take long for his efforts to pay off. "We probably generated \$25,000 in business



pany to participate in a pilot program for an Internet trading system called the Trade Process Network (TPN), which is operated by GEIS.

GE Lighting puts jobs up for bid on TPN, a private site on the Web, and transacts orders with contractors such as Matrix. Matrix and other qualified vendors bid on jobs under a sealed-bid process, and GE Lighting awards the contracts after established deadlines.

Matrix Tool's operations manager, Richard Wilson, says the Internet-based service makes bidding and order fulfillment more efficient by automating the process and eliminating much of the paperwork.

"Everything happens in real time, and there's less sending things back and forth," says Wilson. "It makes it easier to deliver parts when they need them."

The Web system is also cost-efficient. Instead of subscribing to the private network, Matrix connects by modem through a local ISP for about \$25 a month.

The new system has brought more work into the shop, Wilson says, but because the Internet is more affordable and accessible than the private networks, he expects a greater number of small firms to compete for jobs.

Wilson believes Matrix has been able to get a jump on its competitors by becoming familiar with the Internet early on. The company has been using e-mail to communicate with many of its customers for nearly two years, largely to exchange drawings, purchase orders, and other messages.

"When we started I was actually surprised by how many of our larger customers didn't have access yet," Wilson says. "Now it seems like everybody has their own Internet address."

Business-to-business electronic commerce is expected to be the fastest-growing area for Internet sales; Forrester Research projects that in 2000, such commerce will generate \$66 billion. One reason is that businesses buy more from one another than consumers buy from businesses. Forrester's Meringer says small businesses have much to gain from Internet-based EDI. "The Internet is cheaper, easier, and faster to connect businesses than using proprietary EDI," she says. "You can talk to more people."

Start With The Basics

For Matrix Tool, using the Internet was a matter of serving its customers' interests. But other companies will have their own reasons for using it. Boston College's Cronin suggests those reasons are a good place for companies to start when preparing their Internet plans.

"Find out how to do things better and

Do's And Don'ts On The Net

In its 27 years, the Internet has developed a unique culture—one that values personal privacy and, until recently, was decidedly noncommercial. The Internet has opened up to commercial activity in the past three or four years, but users still expect businesses to conduct themselves with decorum. Your chances of incurring the wrath of these users will be minimized if you follow these basic do's and don'ts.

■ **Don't send mass electronic mailings** about your company's products and services to individuals or Internet newsgroups. Businesses that send such unsolicited electronic mail do so at their own risk. Internet users often respond immediately with angry messages called flames. The volume of incoming flames has been known to overload the server of the offending company's Internet service provider (ISP), resulting in cancellation of the offender's account.

■ **Do send e-mail about your company** to people who have expressed interest in receiving it from you. Post commercial messages only in newsgroups that explicitly allow advertisements.

■ **Don't post questions and comments** in discussion areas such as newsgroups, chat rooms, or mailing lists if your postings are not related to the group's subject matter.

■ **Do observe or "lurk" in a discussion** area to get an idea about its subject matter before posting messages. Read the group's frequently asked questions (FAQ) to find out what type of material is appropriate.

■ **Do give advice and make comments** in discussion areas where you and your company can offer expertise.

■ **Don't type entire messages or words** in capital letters. This is the on-line equivalent of shouting.

■ **Do keep e-mail messages and newsgroup postings short and relevant.** Longer messages take more time to download.

■ **Don't overload your Web site—especially the topmost page—with an excessive amount of graphics.** Graphics are eye-catching, but they can take a long time to appear on the user's computer screen, particularly at 28.8 kilobits per second or slower.

cheaper," she says. "If [companies] make the Internet into a significant tool for running their business, then they've built a foundation for revenue. But if they do it the other way, that's where you see disappointment."

As Cronin says, it's easy for companies to get carried away pursuing various ideas for using the Internet and thereby lose their focus. She says it's important for companies to determine their objectives for using the Internet and to draw up policies that support those objectives.

Such goals should include setting policies on how employees can use e-mail and the Web. Many company executives believe that Web use by employees can reduce productivity, according to a survey by Robert Half International Inc., a personnel firm in Menlo Park, Calif. Cronin says companies should be careful to strike a balance between encouraging use and setting limits. (For more on this subject, see "Don't Get Caught In The Net's Web," Page 22.)

One common mistake business owners make is setting unrealistic expectations about what the Internet can do for the company. Although many small companies have been successful marketing products on the Internet, most have struggled to turn their Web site into sales, says Internet consultant Dern.

He says many companies venture onto the Internet without really knowing what it can do for their particular business, then they just wait for the benefits to happen. It's better, Dern says, for a company to set expectations for how much time and money the Internet will save the company, both internally and externally. "You have to look at the Internet as being at least as valuable as what you were doing before," he says.

Having a plan has certainly helped A&a Printers. Hu, the president, says the company spent more than a year designing and testing its site. Along the way, A&a consulted its longtime customers, and it has continued to involve them as the site has evolved. The result is paying off in efficiency and improved service.

"By any rational sort of business model, we shouldn't be involved in this," Hu says. "But being small gives us the dexterity... to do things very quickly."

Companies such as A&a have gotten a big head start on their competitors in putting the Internet to work for their businesses. But the growing number of firms using the Internet means they won't be alone for long. That's why it's vital for small companies that haven't done so already to start making plans for the Internet now. They simply can't afford to be left behind.



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