METAPHORS AND THE NET
by Jerry Michalski


Sometimes this vocabulary works well; more often, it runs out of power. Spiders traverse webs; the rest of us get tangled in them. Normally, we use nets to catch things; we don't read nets or put them to use. Our mental model of cyberspace may be a web of links, but it doesn't really function that way.

If we "surf" cyberspace (whatever that is), where are the waves, whose beach are we on, and what does surfing have to do with reading things on Web pages? We don't leave trails when we surf in the ocean, nor do we chat with people on nearby boards. Yet we seem quite comfortable using "web," "net," "surf" and other words to describe cyberspace and how we use it.

The point is, we morph the Net to please ourselves. It happily accommodates whatever mental models we want to project on it. Like cooking with leftovers, sometimes the results work, sometimes they don't. But to be accessible and useful to large numbers of people, the Net will likely have to settle into one or two dominant (and interrelated) metaphors.

Vitamin-enriched Pods

We began to examine metaphors and the Net at this year's PC Forum, which opened with a speech by UC Berkeley linguistics professor George Lakoff on how metaphors affect our perceptions and actions (see Release 1.0, 3-97). The Forum also featured Internet-connected workstations grouped into seven themed "Pods." By pointing to relevant sites across the Web, each Pod illustrated a metaphor currently in use to describe and navigate cyberspace. Those Forum Web pages, updated with this issue's text and all the URLs cited in it, are now published on our Website at (www.edventure.com/pods).

HAPPY TAX DAY!

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Names, phones, dates, URLs.
This issue of Release 1.0 picks up where the Forum Pods left off. It expands on the seven metaphor descriptions and adds commentary about what the metaphors signify, how they interact and where they might lead us.

There are several different ways to approach this issue of the newsletter. You can think of it as our value-added mini-Yahoo!: In it, we categorize Net life from seven different perspectives, with references to the top examples of each topic we touch. The beginning of each section describes the metaphor through examples; the end offers critiques and commentary. We hope you find yourself returning to the Web version as a reference, the way you might use Yahoo! today.

You can also think of this issue as a cyberspace metaphor store. The idea is to try a theme on -- to allow it to change your perspective -- and then see whether you like it and why. Does it make life easier for you or get in your way? How would you use it or explain it differently? Does it open new possibilities or limit your freedom of activity? What are each scheme's principal navigational features and tools? What sense of orientation does it give? Does it suggest job or product categories that don't exist yet?

What you think is what you see

Governing metaphors set up a surprising number of expectations. When a friend says, "Life is like a river," your mind starts making associations. It's like going on a short, almost involuntary trip. You follow the words. When a computer displays a virtual desktop, you begin to make assumptions about what the elements on it ought to do. When the artifacts don't meet your expectations, you feel frustrated. Creating intuitive and consistent metaphors is the essence of good software design.

It doesn't take much to trigger a metaphor. A few words can set it in motion. In fact, the most interesting and powerful metaphors are often the most simple ones.

Most advertisements, TV shows and Websites have many layers of metaphor, as well as messages both explicit and implicit. A Website might be pitched as "a cozy cafe where you can chat with friends," but when its owners talk to advertisers about the "eyeballs" it attracts, they don't think of them as having mouths. More likely, they hope the "members" have good credit ratings and high marginal propensities to consume.

With all this in mind (and before we get too far off track), here are brief descriptions of the seven metaphors. The second section of this issue covers each in detail.

The physical world

Cues from real life help people get oriented and make use of novel objects. When shopping in a virtual store, your "shopping cart" is likely to hold items you want to buy; you'll head for the "cash register" to make your purchases. On a software desktop, the Rolodex should contain addresses, and clicking on the phone will probably start a phone call. Similarly, file folders contain files and the trash can disposes of them. A floor plan can show easily what's happening where.
Conceptual space
People naturally think in terms of hierarchies, flow charts, time lines, topologies and webs. The most efficient way to find and use things is to index, list, describe and map them in ways that illustrate their relationships. Why walk down a virtual street or scan virtual bookshelves when you can go straight to the answer you seek with a search engine or directory service? Why stare at a spreadsheet when you can fly through the data to scan for hidden patterns?

Social life
The Net is about relationships; what matters most are tools that help people build relationships. The Net offers a rich (and bewildering) variety of communication tools, including: buddy lists, which let you know when other people you care about are online; text conversation tools, such as chat and threaded discussions; multimedia conversation tools, which integrate voice with chat, document sharing and more; personal Web publishing tools; multi-user virtual spaces, complete with avatars, gestures and exotic environments; and directory services that help people find each other. Over time, novel combinations of these features will replace the dial tone and busy signal, today's default communications interface.

Multi-player games
Pong heralded the direct-manipulation interface; multi-player games have something to tell us about future groupware systems. Social games such as bridge, poker, go and chess have a long history online. Online game systems have innovative user interfaces, character and avatar design tools, ways to specify and match player skill levels, invitation protocols, communication technologies (inside and outside the games) and community-maintenance systems. Gaming "tribes" and "guilds" post news items and boast about their abilities on their Websites. They periodically run tryouts to test applicants for membership. Some day, it may be as natural to come home and relax with a game of multi-time-zone bridge or Doom as it is today to turn on the tube.

3D
Is 3D inevitable? Will we end up flying, walking and zooming through a three-dimensional cyberspace? 3D is flexible. Its applications fit many of the other Pod themes, including data visualization, navigation through realistically rendered city scenes, interactive multi-user spaces, abstract data environments and more. Much of the Web activity in 3D is based around the Virtual Reality Modeling Language, but there are other popular 3D or near-3D formats, particularly photographic, 360-degree scenes, which can be combined with synthetic images in useful ways.

Traditional media
The new medium is like the old ones, but with a twist. On the Net, we can have real interactive TV shows with companion program listings, live viewer polls and on-demand feeds; active classified ads with listings that show the goods (or people) in question, links that help close deals, and items that expire when the deals are struck; tailored and media-enriched news with links to raw footage and com-
munity commentary. Virtual postcards, e-mail and Internet telephony are relatives of traditional communication media, too, as is "push" technology.

Brands & advertising

What matters in cyberspace is having a name people know and a place people return to -- so you can sell the audiences to advertisers. What Website or Net service do you think of when you want the latest news? A recommendation for a good book? A smart discussion about the economy? There are new online brands and old brands making their way online. Ad revenues on the Net aren't as big as most companies would like, but the advertising industry has moved quickly to establish itself there. Clickstream analyses, surveys and rate cards now meter and price the amazing variety of user activities that the Net makes visible. Online ad aggregators, ad development specialty houses and ad-analysis packages are up and running.

These seven metaphors are not exhaustive -- we introduce several more in a moment -- nor are they mutually exclusive. In fact, they overlap and dovetail in interesting ways. Some Websites or Net services fit nicely within several metaphors.

For example, a 3D rendering of a town square would fit both the 3D and Physical World themes. Add participants who can wander around the square in avatars, chatting, and it involves Social Life; add paintball guns and it's a Multi-Player Game; have Pepsi sponsor it with banners or billboards and it's part of Brands & Advertising.

More metaphors, please

We considered more than seven metaphors when choosing which ones to describe in this issue. The three runners-up were: the Net as ecosystem, as war and as business environment or market. These themes are similar in interesting ways, but we didn't create metaphor descriptions around them for different reasons.

The eco-metaphor echoed throughout this year's PC Forum (The Living Web: Models and Metaphors). Ecosystems have food chains with predators and prey, hosts and parasites. These creatures live with each other and the environment in a complex rhythm of cycles, balances, dependencies and codependencies. The systems' elements evolve and coevolve. Species and individuals collaborate and compete, they thrive and die out -- usually at each others' hands (or claws, or roots). They re-use genes and physical substances. Occasionally they suffer random mutations or catastrophic events.

In the context of this month's topic, ecology is the uber-metaphor. It describes not only the interactions among the seven metaphors described here, but also larger issues such as how cyberspace and real space affect each other, how humans will use technology, how technology will transform human relationships and so on.

What the Web-as-ecosystem metaphor doesn't do -- yet, anyway -- is help us describe or navigate cyberspace, which is why it isn't one of the seven themes in this issue.
Metaphors are Hell

War -- and its cousin metaphor, sports -- is narrower than the ecological metaphor. Ecosystems are pretty brutal places. Species are at war all the time; some become lunch for others. Business people often use war and sports metaphors to describe market dynamics. But again, describing the dynamics of the Net doesn't help explain the scene itself or how to navigate it. With the exception of firewalls and attacks by hackers, we don't commonly describe companies creating fortifications or sending their troops out in phalanxes to meet the virtual enemy. Hence war's omission.

The third theme is commerce, with its purchase orders, configuration and shipping systems, electronic markets, customer service and more. Commerce simply speaks for itself. Online markets such as OnSale, which runs auctions, or Aleph, which makes markets in document translation, aren't metaphors -- they're the real thing (see Release 1.0, 3-96 for both). When companies create virtual cash registers or marketplaces, they are using one of the metaphors we have defined, such as The Physical World.

One last note on this theme. Markets are more self-aware than ecosystems, which are relatively blind. Even though their lives depend on it, coyotes probably don't consider the effects that their hunting practices will have on their prey's population. Market participants have more information visible to them, often because it is mandated by governments or market makers. Participants are aware of each others' existence and actively plan ahead. They learn and adapt to one another.

The name game

How companies describe themselves and their products will critically affect how much of their potential markets they capture. The metaphor game has serious implications for product design and naming -- even company naming. Why did Scott Kurnit choose "The Mining Company"? What is a "Virtual Vineyard"? The same product or service might attract different customers if it were given different names. Many great products flop because they are named or explained so poorly.

All of the metaphors described here affect business and private life -- even the ones that appear to apply only to private life, such as Multi-Player Games and Social Life. In particular, how people interact is an essential and under-researched element of data connectivity. Long run, if people and their relationships really are central, Bill Gates' "Information at Your Fingertips" may well succumb to freelance market strategist Doc Searls' "A Market Is a Conversation."
What is a "consumer"? (flame alert)

Customer reactions to products and services depend in part on how the selling companies treat their customers, much of which is embedded in the language they use. Some people object to the computer industry calling its customers "users." We mind "users" less than we mind the sneaky term "consumer," which Western society has largely accepted and internalized.

Consumption is an end point. Its by-product is waste. Consumers don't do things to, with or for each other. They are considered powerless and trainable. Even the agency that is supposed to help them is poorly named: the Consumer Protection Agency. Stated bluntly, the consumer metaphor is "customer as eye, trainable neural system and wallet." That's the full text behind "eyeballs."

The Net's global, accessible connectivity allows people to do much more than merely consume, including join forces. Also, people can forward and make use of electronic products more easily than physical ones. Many terms are more productive than "consumer:" customer, client, member, participant, citizen and supplier, to name but a few.

The idea that consumers should offer their attention in exchange for cash rewards is subtly dangerous. It reduces attention solely to the status of a marketable commodity. But attention is something that people normally give to each other without bargaining.
THE METAPHORS

Here are the seven metaphors, described in more detail. Some are considerably longer than others. All of them are interrelated. Each one begins as a more-or-less enthusiastic pitch and concludes by highlighting some expectations, limitations and implications of that metaphor.

THE PHYSICAL WORLD

Relating objects in cyberspace to familiar objects from the physical world such as desktops, file cabinets, bookcases, catalogs and stores is intuitive and useful: It quickly offers people a sense of place and sets expectations about what is possible and often how to go about getting things done.

Once you’ve mastered point-and-click and drag-and-drop, using the desktop metaphor’s file-folder and trash-can icons is relatively straightforward. The same goes for an interface that shows a town square, complete with a post office, bank, library, department store, school and village green. You click on ("go to") the post office to send and receive e-mail, the bank to pay bills and request loans, the library to do research and so on.

But drag-and-drop and the village square run out of steam quickly. At some point you have to work too hard to manage which window is above or next to which other window in order to drop things in the right place. Or perhaps what you need to drag where stops making intuitive sense. The village square runs out of gas when you need to speed things up, or when you need to do complex things that the metaphor can’t accommodate. Apple’s eWorld and General Magic’s MagicCap are two ill-starred projects that used the village square metaphor.

How virtual objects are rendered doesn’t matter. They can be in 3D, 2D or plain text; in real images, synthetic ones or a combination. In fact, the mere mention of the object in text can invoke the requisite response in the participant-viewer-user-audience member (yikes! what to call her?). What matters is that virtual items represent objects that have size, shape, weight and orientation as well as features, functions and limitations, all of which tap deep into our experience with real-world objects and their limits. When you see a doorknob, dog-eared page, light switch or cash register online, will it cause you to do the right thing?

Vertigo!

A nice way to explore the many ways to use physical space metaphorically is to zoom from macro to micro -- more specifically, from the planet down to the desktop. One of the many technology items inspired by Neal Stephenson’s sci-fi novel *Snow Crash* is the VRML-based WebEarth interface. Created by Autodesk founder John Walker, WebEarth lets you see and "fly" around a texture-mapped sphere with real satellite weather photos only hours old (you can get such images at any time from Web services such as WeatherSpout and Intellicast, or from their sources directly).

It’s easy to imagine where Walker and his crew could take WebEarth. By adding layers to the model, you could drop through the clouds to see any land mass, then zoom down to street-level maps from Web-enabled mapping vendors such as Vicinity or MapQuest, and beyond to finer levels of detail.

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Each layer might have a different data source -- or perhaps composite
sources, depending on the use. For example, the street-level maps might be
combined with real-time traffic data or yellow-pages information telling you
where the nearest pizza place or 24-hour drugstore is. The data sources
could vary by application, making a tourist's view of a map different from
an electric utility worker's or a real estate agent's.

Vicinity already has some of these features. It offers driving directions,
and it can present a map so a sponsoring company's local outlets can be
highlighted in the display with small corporate logos.

Maps are abstract representations of the real world. Drawn at different
scales, they can serve many useful purposes. Political or territorial bor-
ders can separate populations or virtual communities; city maps can
highlight neighborhoods, landmarks and major venues; and campus or building
plans can show offices, facilities and locations of special events.

On the ground

To continue the macro to micro zoom: Zipping inside a 3D virtual bank
lobby, you might see cyborg tellers or loan agents sitting politely at their
desks, ready to help you but looking a bit too much like the Terminator for
comfort. A store might have rows of virtual shelves with pictures of wares
perched on them, or even a 360-degree photobubble of the actual store, with
wares and signs superimposed on it (IBM is demonstrating such a scenario
using its PanoramIX technology).

You might put some items in your virtual shopping cart and head toward the
virtual cash register, where you pull out your virtual wallet and pay --
with real money. Or you might generate "rooms" with plain text, the way
Phoenix schoolkids create spaces for each other in the MUD named MariMUSE
(see Release 1.0, 5-95).

You could tour a virtual museum or part of a city. Planet9, a 3D develop-
ment house, has created data files that represent many urban areas, includ-
ing Virtual SoMa (the South of Market area of downtown San Francisco). An
art critic could create her favorite museum online, combining photographed
pieces of real museums with photographed and computer-generated art hung or
installed in constructed virtual spaces. The permutations are mind-
boggling, but that's the point: The power exists to create highly complex
spaces, yet we're not quite sure how to make them coherent and appealing.

Getting around

When you deal with the physical world, vehicles can help you get around.
Contigo's Itinerary lets you take a guided Web tour in a Java-based air-
plane; AOL's Virtual Places offers the same feature (plus many others; see
Release 1.0, 2-95) aboard a magic carpet, couch, spaceship or bus. (Note
that there is little purposeful use of the highway metaphor in cyberspace --
including those pesky "under construction" signs. Where the highway does
apply is in the infrastructure, which does suffer from traffic jams and
bottlenecks and will continue to have battles over toll fees and access
charges.)
Sometimes the idea of place is used superficially, to create a label that is memorable because it invokes stereotypes, such as when GeoCities calls its techie zone Silicon Valley or the skiing zone Aspen.

**Top o’ the desk to you**

The famed Xerox PARC-Macintosh-Window desktop metaphor is a well-established effort to map things a computer does -- move files, launch applications, search disk drives -- to artifacts on our desks. A few products such as Wang’s pen-based FreeStyle went even further, adding staplers and copiers to the desktop. These enhancements didn’t stick, though, and the basic desktop is tired. Microsoft’s Internet Explorer 4 and Netscape’s Constellation and Apollo are efforts to redesign it (see box, next page).

More recently, Infodata decided to take advantage of the connectivity that the Internet offers. Its product, the Virtual File Cabinet, enhances the desktop metaphor with more functional file cabinets, file folders and so on. Instead of fussing with the OS’s native file system, VFC users get to customize a more manageable environment that helps them share files easily.

Several other startups are using simple representations of office artifacts to create powerful Internet-based virtual offices, complete with multimedia inboxes, Rolodexes and file sharing. HotOffice’s system is hosted on HotOffice’s server (for $30 a month); the Netopia Virtual Office from Parallon ($50 once) runs on a server in your own PC.

Virtual inboxes and e-mail messages are curious artifacts. Some e-mail systems even simulate postage stamps, though they don’t get used the same way as real ones. Most e-mail systems use drawings of envelopes or rural post boxes with flags to indicate when mail has arrived.

Given the natural trend toward bringing all messages into the inbox, particularly voicemail, how will the metaphors hold up? What will happen when we begin to place phone calls from the same inbox? Video? And how are live and streaming video different? In the process of reconciling these issues, the current metaphors will probably break down. Designers will have to create new ones.

All of this applies, of course, to standalone software design, particularly icon design. The world of PIMs (Personal Information Managers) is a good case in point. Lotus Organizer emulates a physical notebook organizer. It even appears to have loose-leaf metal rings down the middle, though you never need to open them. NetManage’s Ecco doesn’t emulate a real organizer; it’s more like a database, which allows it to pack a bit more power. But Ecco is considered harder to learn and use.

**Real, local life**

Sometimes metaphors and reality intersect directly. After all, nothing maps better to the physical world than real, physical things. Local services and Webcams bring the real world directly onto the Net.

Local Web services are hot now. They’re a good idea, not merely a fad. Idealab!’s CitySearch, AOL’s Digital City and Microsoft’s Sidewalk have all tackled local markets, and they’re making real progress getting local...
How Microsoft manages metaphors in IE4

Microsoft's soon-to-be-released Internet Explorer 4, code-named Memphis, treads some interesting metaphorical territory. One of its primary missions is to blend the desktop and Web navigational metaphors. The OS will gain "back" and "home" buttons, as well as history lists (files and sites you recently visited) and more.

Let's take one small aspect of the integration work as an example of how difficult a job this is. Web browsers have a single-click interface; the Mac and PC file systems don't... yet. Despite Microsoft's efforts to move IE4 to single clicks, the double-click OS still lurks underneath. Try to open a file from within an application. The dialog box you get requires double-clicking to open files. Until Microsoft redesigns all the forms, dialogs and so on, there may be no consistency at this level.

And there are many other levels to consider. For example, users accustomed to clicking on file names or icons in order to merely select them will be surprised by the single-click interface: It will launch those files right away. To select files in the new shell, you hold the mouse over them and pause a bit; attention automatically shifts to the files you point to.

Boundary issues

Microsoft wants to blur the boundary between your desktop and the Internet -- a noble goal (of course, in Michael Crichton's words at the PC Forum, not knowing your boundaries is a sign of psychosis). But how will you know where things are stored and what is really available when you need it on a plane? How will you know that one window on your screen is currently being shared by six people around the world (don't drop any incriminating personal notes in there!) and the next one is perfectly private?

Now complicate matters by combining e-mail with voicemail, faxes, calendaring and Net news. Then add push technology and channels. Or rules, filters and intelligent agents. Microsoft has an awesome task still ahead.

Finally, migration from Windows 95 to IE4 poses its own problems. Everyone won't leap to the new scheme. Microsoft has to plan for people who will want to use IE4 as their shell and those who don't. How should the two operate differently?

This transition will take time. Meanwhile, Netscape has an opportunity to slip in with Constellation and future releases of Navigator. But the design task it faces is only slightly less daunting, since it doesn't have to worry about the legacy OS elements... except for the elements that get in the way anyway.
merchants and groups online. Between them, they threaten to transform the newspaper, Yellow Pages and leisure-service businesses, if not all local commerce (see Traditional Media, page 23).

Want to see interesting (and curious) real places? Check out the World of Webcams for some great examples.¹ You can have a porthole open all the time to just about anywhere -- inexpensively. You can also keep a microphone or video feed open.

**Bumps and potholes**

Software that emulates the physical world can never be flawless. There are too many opportunities for rough edges, sudden discontinuities and dead ends. Inside a 3D virtual store with virtual shelves, you may click on a sweater you like. But when you do, the system switches metaphors or perspectives suddenly and drops you in front of a picture of the sweater.

Real space is often inconvenient: It doesn’t have shortcuts or wormholes. Similarly, moving around virtual spaces that map faithfully to physical space can be time-consuming and cumbersome. If you have to cross a "street" or traverse several "hallways" to get a file from the "library" each time you need it, you will soon tire of the charade.

Metaphors can be limiting. Sometimes cyberspace artifacts can do more than their physical space counterparts. They end up underrepresented or underpowered. How do you add affordances or notes for stuff that isn’t present in the physical object without breaking the metaphor?

**Lack of realism**

On top of all the other limitations, users have to map their two-dimensional mouse and screen to each other, and then to whatever is represented, even though it may require three-dimensional motion. Instead, we settle for mouse clicks to trigger activity. We click to turn pages, click on avatars to speak with other participants online and more. Huh?

It’s highly unlikely that we will shift to more powerful interface devices such as data gloves or interactive, motion-sensing holograms. As a result, today, kids are playing too many vapid CD-ROM edutainment titles that train them to click madly on everything until something jumps out at them, makes a noise or uncovers a small secret.

That leads to another problem: Working with virtual objects often substitutes for more important social interactions. The technical challenge of rendering a fabric on a 3D mannequin made to look like the customer in ques-

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¹ WebCams are digital, Internet-linked cameras (still or video) that stay focused on one scene and feed images to a Web page frequently. They’re easy to implement. In fact, several devices exist that connect a digital camera directly to the Internet, without tying up a PC. For example, Microplex’s NetworkEye Frame Server has an Ethernet connector and a parallel port into which you can plug a Connectix QuickCam or equivalent. Inexpensive and nifty.
tion can obliterate other aspects of the shopping experience that may be more important, such as the sincere sales person who gushes, "It looks lovely on you!" (see Social Life, page 14). How do you transmit sincerity online? Good question.

What is real?

Today, cyberspace and virtual reality exist in contrast to the physical world. That boundary will blur as developers enhance reality by doctoring digital images or superimposing virtual objects on real spaces. Imagine glasses that know where you are and label things as you pass them.

CONCEPTUAL SPACE

The description of seven metaphors in this newsletter is a conceptual space.

The Web itself is a loosely, locally structured conceptual space. The simple tables of contents, bookmark files and navigation bars that people publish offer local order. (Bookmarks, by the way, are terribly underrated and underpowered. More on them in the following months.) So do more sophisticated Website mapping tools such as Microsoft's WebMapper, which follow site links, infer site structure and display it as well as they can.

At the lowest level, typography and design are expressive tools, too. They direct attention and mark items of higher importance, or show what goes where in a hierarchy or semantic space. The late Muriel Cooper, who taught at MIT, articulated much of this vocabulary.

Yahoo! categorizes Web artifacts in an elaborate hierarchy -- a popular conceptual space. Search engines such as Infoseek, AltaVista, Lycos and HotBot allow us to look for specific word occurrences inside Websites.

Beyond Boole

A few new tools go well beyond Boolean text search. IBM's Query By Image Content (QBIC) lets you search through image databases by asking for images with similar layout, texture or color patterns, among other dimensions. Manning and Napier Information Systems' DR-LINK (Document Retrieval using LINguistic Knowledge) analyzes and presents relationships between word occurrences. DR-LINK can find links between documents by examining semantic relationships, which makes it a powerful tool for precise searches in complex fields such as copyright law.

Several tools create near-3D semantic spaces that users can click and zoom through. Apple's Meta Content Format (aka HotSauce) focuses on client-side display of semantic information. It doesn't have a server side and relies on receiving data to display from smart applications.

Semio's SemioMap, Perspecta's as-yet unnamed product and IdeaLab's Visual Search emphasize smart content parsing and relationship mapping (see Release 1.0, 5-95). All three create 3D spaces with words you can navigate through. Each is better at a different thing: SemioMap has great parsing technology. It infers summarizing terms that add real value to a search and help direct the searcher to the right subsets of a collection.

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Perspecta has great display and navigation technology that puts Muriel Cooper’s principles nicely to work to offer progressive disclosure and plenty of on-screen information without overwhelming the user. Visual Search can span very large information spaces, which lets searchers operate within a larger context.

**Visualize this!**

Network operations experts often use visualization tools to monitor and troubleshoot their systems, which are represented schematically.

Valdis Krebs’ InFlow software feeds a Java diagram of the results of analyses of computer-industry dynamics and allows users to experiment with it (see *Release 1.0*, 2-96). In the example available on his Website, the links between computer companies reflect the strength of real-life relationships. Minority investments and marketing relationships are weaker links than joint ventures or majority investments, and the "rubber bands" that signify those links are commensurately weaker or stronger.

In a slightly different direction, futuristic user-interface designs range from efficient ways to present and navigate dense information clusters to interfaces that highlight the role of time. For example, Xerox spinout iXight markets a hyperbolic viewer that looks like a fisheye lens or magnifying glass running over the screen. Whatever is in the center of focus is less packed and more readable; items on the periphery are in smaller type and scrunched together.

At Yale University, Scott Fertig, Eric Freeman and David Gelernter developed Lifestreams, a user interface that treats everything chronologically. Its working hypotheses are that related documents are usually close in time and that people have a great memory for roughly when they did things. In a much more limited way, the journaling feature in Microsoft’s Outlook has similar functionality. It tracks events and allows the user to retrace their steps.

**Using VRML**

Many consultants, researchers and software houses are developing 3D data-visualization systems using VRML (the Virtual Reality Modeling Language). The tools can front-end powerful databases with navigable 3D bar charts or 3D store models. For example, Visual Decisions and Arbor Software’s Essbase work together to present information in n-dimensional databases in useful ways that are navigable with conventional VRML browsers, adding power to the analysis (see a pattern you’re interested in? click on it to drill down) and expanding the tool’s potential audiences.

IBM’s QUEST shows retail-store data mapped to where the items are actually displayed in a store. If cereal sales are slow, that shelf space might turn red. Tom Ray’s Tierra simulation has advanced beyond DOS character-mode bar-charts (see *Release 1.0*, 2-93). Now it represents its results as 3D environments with spheres of varying sizes. A research group at the Technical University in Darmstadt uses VRML to illustrate chemical reactions.

**A conceptual life**

The biggest barrier to these tools’ greater acceptance is personal preference: Some people just don’t like abstractions or conceptual spaces; others...
thrive on (and in) them. Abstract spaces also often lack a sense of orientation, weight or place as well as something we can only describe as concreteness.

SOCIAL LIFE

The Net is about relationships; its most important features are those that let you locate and converse with friends, relatives, peers, customers, prospects, opponents and competitors easily and appropriately. (Disclosure: Although we enjoy virtual "rooms," "town centers," VRML simulations and news "channels" as much as anyone, the Social Life metaphor is our favorite.)

Where are you?

Buddy lists are a great way to keep in touch with the people you communicate with all the time, whether they're your work team, collaborators across the world or family members. Typically, you ask people whether you can add them to your buddy list. Then, whenever they get online, their name appears in a small window that you can leave on your screen all the time. You can select any person on your buddy list and send them a short text message, invite them to a chat room or launch other applications (see Release 1.0, 1-97).

Although there are some historic precedents, the first buddy list to emerge was AOL's, in the most recent major release of its software (version 3.0). But AOL buddy lists work only for AOL members. Several other systems have launched since then, including IdeaLab's PeopleLink and Mirabilis' ICQ ("I seek you"). As Andrew Busey of iChat mentioned at the PC Forum, his company is working on one, too.

To get people's contact information, we can check directory services such as Four11, WhoWhere? and SwitchBoard (the former two offer registration and harvest e-mail addresses off the Net; SwitchBoard searches white-pages listings, which means it's more complete, but it doesn't track e-mail addresses). These directory services are quickly moving beyond simple name lookup by adding support for affinity groups and membership organizations, and creating tighter business links to companies.

They have to: LDAP (the Lightweight Directory Access Protocol, a way to query remote directories) is turning the directories into background services instead of destination sites. For example, if you use Microsoft's Internet Explorer 4 or Netscape Communicator, LDAP search is built into a dialog-box query. No ads. Other applications will follow suit.

More decisions to make

Once you have found who you want to talk to, you have to decide how you want to communicate, which gets surprisingly complicated the more options you throw in. You might choose the temporal delay (real-time or deferred), mode (text, audio, video or a combination) and group size (two, six, tens or thousands). Over time, we will likely have additional choices such as options to record the conversation and make it available for playback, to set roles that allow different participants to have different capabilities and to switch between high-quality and best-efforts connections — all of which are opportunities for new fee services, of course.

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Today, because our communication systems are disconnected and limited, these choices are made for us by default. If you get e-mail, you probably reply with e-mail. The same goes for voice: You typically call people who leave you voicemail.\(^2\)

To talk in real time with one other person using audio (as opposed to "talking" by typing), you might try VocalTec's Internet Phone, NetSpeak's Web-Phone or similar products (see Pulver.com for more information on Internet telephony). VocalTec, Lucent and others are doing interesting work on POTS-to-Internet gateways that allow people to make calls from PCs to ordinary phones (POTS is Plain Old Telephone Service).

Latitude Communications' MeetingPlace enhances multi-party audioconferences with features such as speaker identification, a simple but highly useful item (an asterisk appears next to the name of whoever is speaking). MeetingPlace also helps set up and manage the sessions (see Release 1.0, 11-95).

OnLive!'s Talker adds multi-party audio to the Net using ordinary computer hardware (vs. a special audioconferencing bridge), an important capability. OnLive!'s Traveler product adds 3D, lip-synching avatar heads to the audio, which changes participants' interactions (see Release 1.0, 11-95).

**Living in real time**

The list of real-time conversation tools is long and growing quickly. Global Chat, Tribal Communications' PowWow, iChat and many other tools offer multi-party, unstructured text chat. LiveWorld's Talk City has built a special venue for chat, as have other Websites.

PlaceWare, which debuted at last month's PC Forum, offers more structured spaces. Its first offering is an Auditorium that HP and Intel have begun to use for training and product-support status meetings (see Release 1.0, 1-97 and 3-97). Contigo's Itinerary offers guided tours on a Java airplane.

Details and features matter. PowWow and ICQ make it simple for participants to exchange files; PlaceWare's Auditorium allows participants to turn their "seats" different colors or vote on questions posed by presenters, enabling new forms of interaction.

Avatar-filled multi-user virtual spaces abound, including Virtual Places, The Palace, OnLive!, Worlds, CyberPark, Mitsubishi Electronic Research Labs' Diamond Park and Microsoft's V-Chat and Comic Chat (see Release 1.0, 11-95 and 5-96; Electric Communities' Doug Crockford maintains a great list). Over time, companies will develop more kinds of venues, lobbies, arenas and other real-time social spaces.

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\(^2\) Two small items: More and more people are leaving their e-mail addresses in voicemail messages, in addition to their phone numbers, which only makes the messages longer. Also, we now can remember more people's e-mail addresses than phone numbers.
On your own time

Fans of asynchronous conversations can turn to myriad threaded discussion systems such as Caucus, Web Crossing, Motet, Lotus' Domino, Netscape's Collabra and WELL Engaged (see Release 1.0, 1-97 and David Woolley's list of online discussion systems). More likely, fans will turn to the online salons that use the discussion engines, most notably Salon 1999 (which uses Web Crossing), Cafe Utne (Motet) and Howard Rheingold's Electric Minds (WELL Engaged).

NetNoir, iVillage's ParentSoup, Women's Wire and MamaMedia all mix original content with discussion forums and interesting hosts to attract specific demographic segments (African-Americans, parents, women and kids, respectively).

The major online services' offerings integrate a variety of conversation tools, notably e-mail, chat and forums. They are all experimenting with more features, including users' pictures on messages, live audio and buddy lists. Separately, Microsoft and Netscape are building similar functions into their software platforms as part of NetMeeting and Communicator.

Simpler togetherness

Interesting new Web-based collaboration systems are making clever use of dynamically generated Web pages. RadNet emulates many of the functions of Lotus Notes. WebFlow allows collaborators to edit documents together, including project-management features such as task assignments.

Intraspect allows colleagues to create and publish collections of notes, links and files to one another. Instead of requiring users to adopt its system wholesale, it operates alongside the applications people use every day, including e-mail, word processors and spreadsheets (Windows 95 is the first platform, but the offering has an HTML version available now and other platforms in the works).

Online "spaces" don't need to be elaborate to host interesting discussions. The WELL and New York-based Echo have used extremely simple, text-based systems for years while nurturing some of the most interesting conversations online.

Can't stop the mail

Despite the profusion of conversation tools -- or maybe because of it -- e-mail is still the workhorse of the Net. The e-mail market is growing in two directions. One group of buyers needs high-function, enterprise-scale messaging now. It is buying proprietary systems such as Microsoft Exchange, Lotus Notes and cc:Mail.

The other group wants messaging systems built around Internet protocols. They will have to wait longer to get power features, but they will be able to integrate systems and switch suppliers more easily. More importantly, this group lusts after HTML-aware e-mail, which will cause considerable chaos even as it creates big opportunities. When your mail, your documents and your presentations are all created from the same building blocks, you can radically change the way you work (see Release 1.0, 7-96).

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Mailing lists such as Lsoft's Listserv, SparkNET's Majordomo and The Shelby Group's Lyris multiply e-mail's usefulness by making it far easier to communicate with many people at once. Automated mailing list archival systems such as HyperMail make the record more permanent and publish it to the Web.

D.E. Shaw's Juno has lured over one million people in front of advertisers by offering free e-mail, including access. Other free e-mail services such as HotMail, Four11's RocketMail and WhoWhere?'s MailCity followed quickly, but with a twist: Their services are completely Web-based, so they're available from anyone's browser, but they have to provide their own access.

Getting personal

People express themselves freely on the Net through personal home pages and opinionated zines (see Release 1.0, 6-95). Some of our favorites are Doc Searls' Reality 2.0 (and his personal pages), Chris Locke's irreverent Entropy Gradient Reversals and Dave Winer's DaveNet. Over time, more of these sites and zines will point to each other, forming a loose layer of perspective, judgment and opinion that others can use to navigate the Net. Already some interest groups and businesses have formed Web rings that point to one another in sequence. Despite the increasing availability of powerful search engines, intelligent agents and collaborative filters (see Release 1.0, 11-96), few things are as powerful as a personal recommendation.

Personal-site hosting services such as Cyborganic, GeoCities and The Mining Company are making it possible for more people to publish on the Web affordably -- and even to make some money in the bargain. (Smart ideas like Amazon.com's Amazon Affiliates Program let any Website earn money for making book recommendations, without having to manage inventory or install a secure Web server. We hope many similar ideas blossom.)

Collaborators

People help each other directly by posting questions and answers to threaded discussions or mailing lists. They also post their reviews of books or other items on their personal Websites or on larger places that offer such facilities such as Amazon.com.

A few interesting variations on personal help have emerged. In an AT&T Labs research project called PHOAKS (People Helping One Another Know Stuff), people annotate Usenet news postings with links and opinions that enrich the content. The HumanSearch service uses humans to answering questions posted to its site. And people help each other indirectly by rating items in collaborative filtering systems such as Firefly, NetPerceptions and LikeMinds.

SixDegrees can help people find out that their partner's son's neighbor's wife might be a useful business link on an upcoming deal. Individuals register at SixDegrees' Website, then they start to add people they know, as well as their relationship to those people. For example, someone might list Esther Dyson or Bill Clinton as a friend. When they do so, SixDegrees sends an e-mail message asking the other party to confirm or deny the relationship. As the database builds up, participants can query it to discover relationships that may span multiple degrees of separation.
Pesky identity issues

Relationships are critical, but how can we build strong ones online if we can't trust people to be who they claim to be? How we represent ourselves in these spaces matters immensely, as does infrastructure that helps guarantee identity.

Until better technologies are available to authenticate identity, private, invitation-only communities will probably have a much easier time maintaining cohesion and trust. Even then, in many online social environments, time builds trust that technology can't deliver: Participants simply get to know one another after a while and they can tell when someone's identity is being spoofed.

The larger issue of identity management touches technologies ranging from physical smart cards and Versit's virtual calling cards (see Release 1.0, 9-93) to avatar persistence, directory services (4-93), encryption and authentication. At the PC Forum, PGP announced that it is purchasing Zoomit, which makes a meta-directory. The combined entity will be a powerful force in identity management. VeriSign, the 1995 RSA Data Security spinout, plays a similarly important role. It is creating systems to support certificate hierarchies so that people can have greater security that items are indeed what they seem to be.

Swift and merciless change

Consider all the products described in the Social Life section as experiments in designing the interface we will some day all use to contact one another -- the software that will replace today's default communications interface: dial tones, numeric keypads, busy signals and voicemail. Today, conversation tools are separate from each other and relatively clumsy to use. This situation is improving quickly, but integration will take time (see Release 1.0, 1-97).

What will tomorrow's communication control panel look like? Will it be separate from our OS or applications? Will it have intelligent agents? Will it recognize speech (as Wildfire, Nuance and BBN Hark do), or just wreck a nice beach?

The current rapid pace of change in software ensures collisions between ruling metaphors. Designers will have to be extra creative. They will have to conquer many subtle issues, including detail (do I want everyone to know I'm on a coffee break right now?), explicitness (Zoe is on my "B" list), social protocols (how do I invite someone to talk or ask permission to know their ongoing status?), naming (is "buddy list" not businesslike? "pager" doesn't convey the right meaning) and metaphor congruence (will I confuse people if I put a "back" button on this virtual kitchen counter?).

New job postings

Social Life applications will highlight the need for new job roles and infrastructure. Moderators and hosts may need to have special skills or training. Will they always need to have domain expertise, or will they be neutral generalists? Will hosting be a part of everyone's job, the way typing now is, or will there be specialists?

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The fridge door

One of our favorite metaphors for the kind of service that households might appreciate is the virtual "fridge door." Real fridge doors are communication devices. Families use them to let each other know they've found a babysitter for the evening or what to get from the grocery store. They put family pictures and kids' drawings on them.

Families with working parents have started to use voicemail as a virtual fridge door. They call the home machine or each others' work systems and leave the same kinds of messages. Of course, they can't pin the vacation pictures there. In many cases where both members have reliable, full-time e-mail, those conversations have moved to e-mail. Still, it's hard to communicate that way.

Imagine a virtual fridge door that is available all the time. It combines a multimedia message box (integrated e-mail, voicemail, faxes and so on) with something we would call a Web page, but is more like a whiteboard you can write and tack things on -- all without the need for an HTML authoring tool. If we ran WorldNet, MSN, AOL or another major carrier, we would build a fridge-door service ASAP and replace households' voicemail systems.

"Gardening" is editing after the fact in order to make chaotic conversations more orderly and pull out their best segments. Will we have time to garden this way? Will companies assign gardeners to review and improve important online conversations? Or will everything we generate in these spaces go into the universal bit bucket?

Finally, Social Life applications will inspire new virtual places and new business models. It costs little to connect to the Net and host a live chat space. Anyone can host such conversations on an ordinary PC. What value do large, produced spaces add? Are conversations too cheap to meter? Where will people choose to gather online? Who will benefit from these gatherings (besides the occupants) and how?

MULTI-PLAYER GAMES

If Pong popularized the now-ubiquitous direct-manipulation interface, then the multi-player games springing up across the Internet may have something to teach us about future interfaces, particularly about group formation, maintenance and collaboration, as well as user-interface design details.

Multi-player games such as Trek, go, chess and bridge have thrived on the Net for years, as have many MUDs and MOOs (see Release 1.0, 7-94). Online trivia and strategy games are popular, too, including Berkeley Systems' You Don't Know Jack, E-Pub's Cosmic Cosmo, fantasy baseball leagues and riddle-driven scavenger hunts such as Interactive Imaginations' Riddler.com (Disclosure: Esther Dyson is an investor in E-Pub). Now branded board games such as Monopoly are making their way online.
Most categories of games are amenable to Net play, including simulations (Kesmai's Air Warrior), sports (Acclaim's NBA Jam Extreme), action (id's Doom and Quake; GT Interactive's Duke Nukem), fantasy and role-play (Advanced D&D) and strategy (Virgin's Command & Conquer). All of these now have avid online audiences. Many of them started as single-player games.

Starwave's Castle Infinity, developed specifically as a multi-player online game, has nifty social features. The most memorable is a submarine that takes four people to pilot: Each controls a propeller that can move the craft in one direction only. Players have to find each other, figure out how the sub works, then work together to get through to the next phase. The game's clever, three-part avatars are also somehow social. Buy the game (on CD-ROM), and you can play online all you want, free.

Let's play!

Finding people to play with online is, of course, the principal challenge for users of multi-player games. Several solutions have emerged. Sites such as HappyPuppy, GameZone, c|net's GameCenter and GameBrief review games, host discussions about them and offer downloads, tips and shortcuts but don't help match opponents. Mpath, TEN and BattleNet are multi-player game systems whose principal mission is match-making. Finally, CyberPark and Electric Communities' Microcosm are complete environments where participants can launch specific games.

Before you can play in most of these systems, you have to create an online identity. This involves at least choosing a user name and often also assembling a character or choosing a vehicle. This process may include rating yourself on various game skills to make it easier to find suitable matches. Some games have elaborate avatar-creation segments. Once you have a character, you can learn to use the system's tools and head out to find a lobby or gaming area.

Most games have practice areas where you can learn to work the tools without making permanent enemies of the serious gamers. The learning process is especially fascinating. How do you chat with others before you have found the chat function? Will people help you, or will they just take advantage of your greenhorn status?

The Cincinnati Kid

Some games are best played in teams. The game-platform companies encourage members to form teams (or guilds, squadrons and so on) and post their scores and short articles on the Web in a virtual newspaper or other channel.

The process of interviewing, testing and admitting new team members has become a major part of the action-game platforms' attraction. Considerable status comes from being top of the heap, and word spreads like wildfire when one of the aces is toppled by a newcomer.

Many aspects of these game platforms merit special attention, including

- the characters, avatars and skill indicators mentioned earlier;
- the waiting rooms and lobbies where people gather;
- the software consoles they use to run the games and interact;

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• the chat systems and invitation protocols that allow people to talk and initiate games;
• the persistent objects the systems may allow participants to create; and
• the way participants navigate the gaming environments.

For example, in ImagiNation Network’s CyberPark, participants invite one another over to gaming tables, where they can launch board games such as backgammon. The games show up in separate windows on screen. That’s quite a few clicks from meeting someone to playing a game with them. One alternative, clicking on another character and hitting an "invite" button, is far less realistic.

Certain spaces suit certain activities. Developers use dimensions, perspective and point of view to exploit the differences. They create worlds that are text (1D), flat (2D), sort of 3D (perhaps mixing flat characters in 3D scenes, or vice versa) and fully, immersively 3D, requiring VR goggles and gloves (see Release 1.0, 5-96). They put the point of view in your character’s eyes, behind you (so you can see yourself) or at a fixed point offstage (so you and everyone else interact equally). A few systems allow for spectators or lurkers. They usually indicate that lurkers are watching by putting a ghost image or eyeball on the screen.

Games that involve team play and complex scenario management often use isometric views, which provide pseudo-3D landscapes that make it easier to track many things going on simultaneously. Many games make highly imaginative use of physical-world metaphors.

A few new games switch uncomfortably between polished video sequences and relatively clumsy shoot-’em-up arcade graphics. Some are great examples of how not to design user interfaces. PC games are notoriously complicated pieces of software; they require plenty of resources, configuration and patience.

Online card games and other less trigger-happy pursuits often have highly evolved chat and gesture mechanisms. The experience in those spaces is principally social.

We may not end up conducting business meetings from the Doom-style first-person perspective, but the features described here are more useful in business than they at first appear. Look how game systems have influenced chat technology and buddy lists, or real-time interaction.

3D

Is 3D inevitable? It sure has many uses. WebEarth (see page 7) and Virtual SoMa are navigable virtual spaces based on real-world data. Semio and Perpecta offer useful semantic spaces that enhance text search (see page 12). Visual Decisions and others specialize in 3D data visualization and other data analysis.

Other companies have created practical and fantasy spaces, conceptual landscapes, works of art, architectural renderings and walk-throughs. There are
also, of course, 3D desktops. Black Sun Interactive and OZ Interactive have
created great 3D multi-user spaces. Protozoa's Floop is a compelling 3D
avatar. Linked to a sound track and animated by an actor's recorded mo-
tions, he can cause quite a stir.

It's also possible to imagine 3D artifacts combined in real time with a
normal scene, offering enhancements such as store names and business hours,
people's names and directions, all integrated with your current view as a
heads-up display.

The VRML stir

Much of the excitement in 3D on the Net is around VRML (the Virtual Reality
Modeling Language), which is a portable, open scene- and object-description
language. VRML is being extended in many ways by Internet committees and
software developers, just as the HTML spec has been.

A small but growing industry has developed around VRML. Construct and other
3D design houses use VRML tools such as DimensionX's Liquid Motion and Para-
Graph's Internet Space Builder to create interesting 3D experiences online.
Meanwhile, on the browser side, SGI's Cosmo Player, Intervista's WorldView,
NewFire's Torch compete for attention as VRML viewers. (VRML founder Mark
Pesce and ParaGraph president Stepan Pachikov have great lists of sample
VRML worlds.)

The non-VRML 3D world is doing well, too. Important legacy 3D formats such
as AutoCAD come principally from the design and architecture communities. A
few companies have created photographic 3D virtual spaces within which
visitors can spin around, look up and down to get a spectacular feel for
real places -- all through their browsers. One of the first was Apple's
QuickTime VR. Several others are available as well, including Omniview's
PhotoBubbles and IBM's PanoramaX.

Fly, walk or zoom

3D is a separate metaphor because your perspective is different -- literally
-- when your entire computing/information/communication environment is 3D.
You have new decisions to make, such as mode switching: Do you want to fly,
wake, sidestep, pan or zoom? If you click the mouse, will you go where it
is pointing or will you invoke the artifact it's pointing to? You need to
move quickly enough to get places efficiently, yet not so quickly that you
whip on by and get lost. And how do you reorient yourself when you get
turned around, anyway? By the way, most VRML browsers have different com-
mands and keyboard mappings.

Navigation of 3D spaces isn't always intuitive. How do you use 2D interface
tools to get around 3D spaces? Will we end up using torque balls, gyro-
mice, VR goggles or data gloves? Developers of 3D spaces need a strong
sense of cinematography to resolve issues of lighting, focus, placement and
point of view.

Performance issues abound. How do you manage level of detail, progressive
disclosure of unvisited spaces and links to new spaces? PCs are only begin-
ing to offer the kind of performance that makes VRML practical.
Finally, 3D doesn’t have to mean fully-rendered 3D spaces. Using the third dimension sparingly can be an effective way to enhance the interface. A little D can go a long way.

**TRADITIONAL MEDIA**

The Net is a lot like traditional media -- with a twist. The Net enables media companies to add features that people have always wanted. If you explore how the Internet will change traditional media, you can describe the majority of future Internet activity -- or so the media companies hope.

For example, TV-quality video won’t be available on the Internet soon, but TV broadcasters can enhance their programming by publishing relevant materials on the Web as shows air, as MSNBC, c|net and CNN do already. These Websites can point to resources anywhere in the world, store archives of video clips not normally available to viewers, run viewer surveys and perform other activities. This might just mark the beginning of real interactive TV. There already are online TV guides such as The Gist and Mediadome. More on channels in a moment.

Radio broadcasters are more fortunate than their TV counterparts, because audio doesn’t require nearly as much bandwidth as video. Perhaps more important to the station owners, Internet bits aren’t limited by distance and atmospheric conditions, so the stations can reach audiences they never could before.

Many traditional radio stations now broadcast on the Net. Also, a few Internet radio stations have started operations, such as AudioNet and NetCast. However, none of these companies have exploited the power of the Net to add new functionality. National Public Radio makes its broadcasts available online in archives, but most stations’ all-music format leads swiftly to intellectual-property protection problems.

All Net broadcasters rely heavily on advances in streaming media over the Internet from Progressive Networks, VDOnet and others.

**Publish or perish?**

Publishers can enhance their publications with active charts, live data feeds, applets, animations and clips of media normally reserved for broadcasters. Like Your Personal Net, they can customize their content for individual subscribers. They can also collect far more information about who goes where and does what on their Websites, which ought to help generate revenue (see Brands & Advertising, page 25).

Publishers will need that extra revenue: Some of their core revenue might well be snatched by Classifieds2000 and other enterprising startups. The company is striking deals to link its classified-ad system to many different Websites, thus growing its base of items for sale while becoming more local or specific. In principle, Classifieds2000 will be able to offer *Car & Driver* a classified service that aggregates the vehicle ads placed for other publications.
Of course, publishers who believe their primary value is their content can simply publish on the Web, as do Microsoft's Slate and the independent zine Feed, among others. In fact, Slate's Website features a version of the publication that prints faithfully on paper. Unfortunately, Web surfers seem reluctant to pay subscription fees, and advertising revenues aren't flowing to the Web as quickly as most would like. Not only are Web publishing and broadcasting business models still unstable, they will probably cause major instability in traditional media companies, too.

Pushing and shoving

"Push" technology vendors such as PointCast, Marimba, BackWeb, Wayfarer and Lanacom have convinced a surprising number of serious publications that the Web's future lies in an Internet-enabled broadcast model. Wired and BusinessWeek ran cover stories simultaneously; the Wall Street Journal ran an article on December 13, 1996, that claimed that push technology had revolutionized the Net. End-users, these publications say paternalistically, are fed up with the chaos online and need someone to create "channels" they can "tune to" and customize. Recently, the New York Times ran articles by James Gleick and Denise Caruso with more level-headed opinions about push technology.

Communication media

Scaling down from mass media still leaves many traditional forms of business and personal communications. Diffusion offers companies a way to create and manage internal communication channels; Intermind helps them build channels with outside audiences. Direct marketing is undergoing enormous changes (see Brands & Advertising). CUC's NetMarket, iCat and others help put catalogs and brochures online. The MIT Postcard Server started a rush of postcard servers on the Net, many of which carry advertisements.

Telephones and e-mail are traditional media, too. Many companies have been working to duplicate the standard telephone's functions online, where distance matters little and calls have zero marginal cost -- so far. The big bonus for end-users will occur as Internet telephony is integrated with other forms of communication and publishing and the whole mess is simplified. The process of integration, simplification and dissemination is likely to take the better part of the next 15 years, though the technology is largely available today (see page 18).

IP protection and business models

Protecting intellectual property is seen as the major issue facing traditional media businesses contemplating business on the Net. In fact, the major problem is how to get revenues in other ways, such as by leveraging their intellectual capital.

Some companies have tackled narrow markets. Liquid Audio lets music publishers protect their property as they sell it over the Net. Digimarc helps companies identify stolen images by embedding a digital watermark in them. InterTrust, IBM and others have broader ambitions. They are creating large-scale systems that facilitate commerce and protect intellectual property.

Finally, questions of what is appropriate for transmission and viewing over the Net have been simmering for several years; occasionally they threaten to
boil over. To prevent such a calamity, groups such as the Recreational Software Advisory Council (RSAC), the World Wide Web Consortium (W3C) and the Electronic Frontier Foundation (EFF) have been working to foster independent, decentralized content-rating systems and frameworks within which such systems can be created (EFF, of course, is also working on privacy issues). NetNanny, CyberSurf and other companies have created client software that can block access to certain sites (see Release 1.0, 12-96 and 2-97).

No more control

Mass media emerged alongside technology that allowed a few companies to control a limited number of broadcast channels, keeping others out. That situation has clearly changed, and the biggest question for major media companies is how the Net will change them. The market pie has just grown vastly larger. Media companies' share of it must decline. The question is how much, and what their new roles will be.

BRANDS & ADVERTISING


What matters in cyberspace is staking your claim and building your franchise, both to get business to your Website and attract audiences to sell to advertisers. The Web has brought with it some entirely new brand identities as well as some rapid failures such as TheSpot, Spiv and iGuide. Who had heard of Netscape, Yahoo!, c|net, AltaVista or Amazon.com before the Net? Now you hear people talking about them on the bus.

Established brands such as ESPN, CNN, the Wall Street Journal, Charles Schwab and Microsoft are trying to leverage their visibility in other media onto cyberspace. Some traditional companies are creating new brands for cyberspace; witness Time/Warner's Pathfinder and Wired's HotWired. Others are playing up their old brands with tongue-in-cheek attitudes (e.g., Mama's Cucina from Ragu). MSNBC and c|net are the most interesting cross-media experiments.

What will happen to the new cyberbrands when established names such as Barnes & Noble and Borders jump onto the Web? Do Web features or cost structures offer a lasting competitive advantage, or at least a viable lead?

Brands are names. The rush to establish brands online has created huge pressures on the domain name system and Network Solutions, the company that manages the names. Now it seems that other low-level domains will come into use through the Internet Ad Hoc Committee and the separate eDNS (extended Domain Name System) initiative. This could well confuse not only people browsing, but entities worldwide trying to register their identities.

Celebrities are brands, too. Many celebrities have fan sites, some of which feel like shrines or even -- let's just say it -- obsessive fantasies that probably shouldn't see the light of screen. That's not all. At Rogue

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Market you can find out which real-world celebrities are hot, and at the Six
Degrees of Kevin Bacon site you can see how many links separate movie stars
from each other -- via Kevin Bacon. Of course, you can read about celebrity
exploits at various gossip sites or mess with their faces at Mr. Showbiz,
which lets you create composite images (take Tom Cruise’s jaw, Pee-Wee
Herman’s hairdo...).

Having a name and an audience is important, but cyberspace hasn’t spawned
any major personalities of its own yet. Whether it does will be a good in-
dicator of the mass-market nature of the Net.

**Impressing**

Many companies are in place to help not only broadcast brand names, but also
match ads to demographics, infer visitor behavior and more. The food chain
already includes:

- advertising aggregators such as DoubleClick, Narrowline, AdSmart
  and FlyCast;
- survey and audit firms such as PC Meter and Nielsen;
- Website traffic analysis packages such as Accrue Insight;
- ad-management systems such as ClickOver, NetGravity and Accipiter;
- power tools for brand managers such as BroadVision; and
- firms that specialize in ad creation and placement such as Intersper
  (recently acquired by Microsoft), Agency.com, SiteSpecific and
  ModemMedia.

Many Websites try to find out what their visitors like in order to target
them better with ads. Affinicast tries to create "channels" that will in-
terest different kinds of people. And of course, Juno, IntelliPost, Mail-
City, HotMail and RocketMail offer free e-mail in exchange for ad impres-
sions; "push" companies such as PointCast, Marimba and BackWeb do the same
with information streams. Behind (or in front of) them all are Websites
such as HotWired, Pathfinder, InfoSeek and Fourll that count on advertise-
ments as an essential part of their revenue stream.

**The other market**

A large proportion of Net business will be small, organic and local. These
deals will never make the headlines, but they will represent a major segment
of economic activity. The companies and individuals doing business this way
will discover each other through personal referrals. They will be inter-
ested in only a few, specific eyeballs, with whose owners they will develop
lasting relationships. This less visible market opens opportunities for
companies to develop new kinds of relationships with their customers.
RESOURCES & PHONE NUMBERS

David Woolley, Chrysalis Software, (612) 374-2664; fax, (612) 374-2731; drwool@skypoint.com
Doug Crockford, Electric Communities, (408) 342-9500; fax, (408) 777-9200; crock@communities.com
Stepan Pachikov, ParaGraph International, (408) 364-7700; fax, (408) 374-5466; pachikov@paragraph.com
Doc Searls, The Searls Group, (415) 593-5590; fax, (415) 593-6190; searls@batnet.com
George Lakoff, University of California at Berkeley, (510) 643-7616; fax, (510) 643-5688; lakoff@cogsci.berkeley.edu
Mark Pesce, VRML guru, (310) 451-9576; fax, (310) 451-3145; mpesce@netcom.com

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COMING SOON

- Relationship and link management.
- Navigation and representation.
- Market-based security.
- And much more... (If you know of any good examples of the categories listed above, please let us know.)

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<tr>
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<tr>
<td>April 21-25</td>
<td>Overcoming Barriers to Electronic Commerce - Malaga, Spain.</td>
<td>Sponsored by the University of Malaga. Call Juan Carlos M. Coll, 34 (5) 222 9160; fax 34 (5) 213 2338; <a href="mailto:coll@vnet.es">coll@vnet.es</a>; <a href="http://www.uma.es/emn/jc.htm">www.uma.es/emn/jc.htm</a>.</td>
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<td>April 25-29</td>
<td>Computer Game Developer's Conference - Santa Clara, CA.</td>
<td>Sponsored by Game Developer Magazine, InterActivity and 3D Design Magazine. From design to the social and legal aspects of gaming. Call (617) 821-9212; fax (617) 828-9992.</td>
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<td>April 28-29</td>
<td>Electronic Commerce for Content II - Washington, DC.</td>
<td>Sponsored by US Copyright Office, the IMA, Imprimatur and the White House OST. Explore technology-based intellectual property management. With Mark Stefik from Xerox PARC. E-mail Evan Shubin, (410) 626-1380; fax (410) 263-0590; <a href="mailto:shubin@ima.org">shubin@ima.org</a>; wwwIMA.org/forum.</td>
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<td>April 30-May 3</td>
<td>Connected Classroom Conference &amp; Expo - King of Prussia, PA.</td>
<td>Produced by National Education &amp; Technology Alliance and Classroom Connect. Nuts and bolts advice on networking schools. Keynote by Infonautics' Marvin Weinberger. Call (888) 252-7776; fax (717) 393-1507; <a href="mailto:register@classroom.net">register@classroom.net</a>.</td>
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<td>May 13-14</td>
<td>Webcasting - San Francisco. Presented by International Quality &amp;</td>
<td>Create &quot;personal broadcast&quot; channels and fine-tune &quot;push&quot; strategies. Call (800) 420-2145 or (312) 977-0180; fax (800) 699-4775 or (312) 977-0194; <a href="mailto:info@iqpc.com">info@iqpc.com</a>; <a href="http://www.iqpc.com">www.iqpc.com</a>.</td>
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<td>Learn to leverage technology to maximize customer loyalty. Call Deb Hay, (617) 742-5200 or (800) 862-2424 ext. 118; fax (617) 742-1028; <a href="http://www.psgroup.com">www.psgroup.com</a>.</td>
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15 April 1997
May 20-21  7th Annual Networked Economy Conference - Paris, France. Produced by Phillips Omnicom Conferences. With Microsoft's Bernard Vergnes and Sun's John Gage. Call 44 (0) 1438-742-424; fax 44 (0) i438-740-154.


May 27-30  Tenth Annual International Software Quality Week - San Francisco. Sponsored by the Software Research Institute. Call Margaret Kenney, (800) 942-7638 or (415) 957-1441; fax (415) 957-0730; kenney@soft.com; www.soft.com/QualWeek.

May 29-30  The European Telecom Board - Stockholm, Sweden. Sponsored by the European Business Board. A senior executive confab to discuss where telecom networks are headed. Call Irene M. van der Meulen, 31 (40) 2974-895; fax, 31 (40) 2974-950.


June 2  3D Design Conference and Exhibition - San Francisco. Sponsored by 3D Design Magazine. Learn about VRML and other things 3D. Call Jessica Rogers, (415) 278-5235; fax, (415) 278-5200; jrogers@mfi.com; www.3dshow.com.

June 2-6  Object Expo and Java Expo - New York City. Organized by SIGS. With Marimba's Arthur van Hoff and VRML parent Mark Pesce. Call (212) 242-7515; fax, (212) 242-7578; conferences@sigs.com; www.sigs.com/conferences/oney97.

June 4-6  The Business of Technology - Santa Clara, CA. Sponsored by Women in Technology International. Call (800) 334-9484; info@witi.com; www.witi.com.

June 9-14  Asia TELECOM '97 - Singapore. Sponsored by ITU. Contact Tom Dahl-Hansen, 41 (22) 730 5298; fax 41 (22) 730 6444; dahl-hansen@itu.ch; www3.itu.ch/TELECOM/ast97/.


July 13-16  Genetic Programming 1997 Conference - Stanford, CA. Sponsored by the American Association for Artificial Intelligence. Call (415) 328-3123; fax (415) 321-4457; gp@aaai.org; www-cs-faculty.stanford.edu/koza/gp97.html.

June 15-18  Global Networking '97 - Calgary, Alberta, Canada. Sponsored by Telus. Call Pete Desrochers, (403) 493-4760; fax (403) 493-5380; pdesroci@ent.agt.ab.ca; www.wnet.ca/gn97/.

June 16-17  @1997 Marketing to Women Congress - New York City. Sponsored by MacDonald Communications. Exactly what it says, including a track on Web marketing. Call Luis Alberto Perez, (800) 447-2900; fax (800) 426-6753.

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<tr>
<td>June 19-20</td>
<td>Cyberpayments '97 - Washington, DC. Organized by NACHA. With Ira Magaziner and VeriSign’s Stratton Sclavos. Call Shawn Nemeth, (800) 529-7375 or (216) 464-2618; <a href="mailto:fbma@en.com">fbma@en.com</a>.</td>
<td>Washington, DC</td>
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<td>June 19-21</td>
<td>Electronic Entertainment Expo '97 (E3) - Atlanta. Sponsored by the Interactive Digital Software Association. See what’s happened to games in the past year. Call (617) 551-9800; fax (617) 440-0359; <a href="http://www.mha.com/e3/">www.mha.com/e3/</a>.</td>
<td>Atlanta</td>
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<td>June 23-24</td>
<td>Online Cooperation Berlin - Berlin, Germany. Organized by International Conferences Exhibitions &amp; Fairs. Covers telework, remote access and mobile computing. Call Astrid Jaeger, 49 (228) 20-11-90; fax, 49 (228) 21-19-44; <a href="mailto:icef@pm.bn.eunet.de">icef@pm.bn.eunet.de</a>; <a href="http://www.online-work.com">www.online-work.com</a>.</td>
<td>Berlin, Germany</td>
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<td>June 23-26</td>
<td>Competing as an Internet Service Provider - Washington, DC. Organized by IQPC. How can ISPs leverage their assets? With speakers from Bell Atlantic, AMS, Booz Allen and Dialogic. Call (800) 882-8684 or (201) 256-0211; fax, (201) 256-0205; <a href="mailto:info@ipqc.com">info@ipqc.com</a>; <a href="http://www.ipqc.com">www.ipqc.com</a>.</td>
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<td>Sept 6-10</td>
<td>SPA 13th Annual Conference - Washington, DC. Sponsored by the Software Publishers Association. Call Maria M. Santos, (202) 452-1600 x328; fax, (202) 785-3649; <a href="mailto:msantos@spa.org">msantos@spa.org</a>.</td>
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<td>Sept 8-14</td>
<td>Telecom Interactive - Geneva. Sponsored by ITU. Call Fernando A. Lagrana, 41 (22) 730 5542/5179; fax 41 (22) 730 6444; <a href="mailto:fernando.lagrana@itu.int">fernando.lagrana@itu.int</a>; <a href="http://www.itu.ch/TELECOM">www.itu.ch/TELECOM</a>.</td>
<td>Geneva</td>
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<td>Sept 15-17</td>
<td>Online World Conference and Expo - Washington, DC. Sponsored by Online Inc. Call (203) 761-1466 x521; <a href="mailto:hillaryd@onlineinc.com">hillaryd@onlineinc.com</a>; <a href="http://www.onlineinc.com/onworld">www.onlineinc.com/onworld</a>.</td>
<td>Washington, DC</td>
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<td>Nov 8-14</td>
<td>ACM Multimedia ’97 - Seattle. Sponsored by ACM. Make multimedia hum, from interactive documents to virtual realities. E-mail Wayne Citrin, <a href="mailto:citrin@cs.colorado.edu">citrin@cs.colorado.edu</a>; <a href="http://www.acm.org/sigmm/MM97">www.acm.org/sigmm/MM97</a>.</td>
<td>Seattle</td>
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<td>Nov 12-14</td>
<td>Interactive Publishing Europe - Zurich. Sponsored by CATCHUP! Communications. Call Norbert Specker, 41 (1) 387 70 88; fax 41 (1) 387 70 80; <a href="mailto:catchup@dial-switch.ch">catchup@dial-switch.ch</a>; <a href="http://www.InteractivePublishing.ch">www.InteractivePublishing.ch</a>.</td>
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Sponsored by us. You read the newsletter; now meet the players. Call Forum Director Daphne Kis, (212) 924-8800; fax (212) 924-0240; daphne@edventure.com; www.edventure.com.

INET '98 - Geneva. Sponsored by the Internet Society. Every four years; over 3000 people expected. Call Mark Measday, 41 (22) 344-64-64; fax 41 (22) 345-92-58; measday@josmarian.ch; www.isocgva.ch.

* Events Esther plans to attend.
@ Events Jerry plans to attend.

Lack of a symbol is no indication of lack of merit.
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