FORUM NAVIGATOR
by Esther Dyson & Jerry Michalski

This year at the Forum we hope to enlighten and enthral you. We're especially excited about the Forum this year because we're at a time when worlds collide: government and industry, Democrats and Republicans, social and commercial Internet users, Americans and non-Americans. Although the Forum always attracts a large contingent of industry insiders, we try to seed it each year with provocative new people and thoughts from outside our framework. Join us to meet with, argue with and learn from your colleagues and counterparts.

Local to global is a delicate tension. It's the fundamental issue in many current conflicts: Should welfare be a local responsibility or a federal one? What are the boundaries between private and corporate life?

In our own industry, we have a globe arguably controlled by Microsoft, and a profusion of local markets. Or is Microsoft competing in a local market (where it has a monopoly) and about to enter a global one — where it faces competition from the likes of AmEx and Time Warner? Along with Microsoft, we all face the choice between local success and a broader global market. Not only is our business getting larger; it's becoming more tightly integrated into the world at large. We are no longer a niche market, but part of the fabric of daily business life.

This issue

This is the first year that we are putting the Forum issue online in a truly hypertext form, with easy cross-references from chunk to chunk. It occurs to us how unified and cross-linked everything is: Brian Arthur to Nathan Myhrvold; Carol Bartz and design templates to IP on Tuesday; Bob Frankenberg to the geography discussions of Monday; and so forth. So read it in chunks, in any order you wish, online or off.

SEE YOUS IN PHOENIX!
MONDAY -- LOCAL <-> GLOBAL IN THE ENTERPRISE

Most pc companies began as small operations, start-ups rather than divi-
sions of larger operations. The pc companies sold products to large corpo-
rations, but they often didn’t understand their customers’ problems. (IBM
was a notable exception: It didn’t understand its own problems, either.)

The conflict between local and global challenges all businesses of any am-
bition. Most productive, creative activity occurs on a local scale; most
start-ups are local. The challenge of our times is to take that creativity
and implement it on a broader basis, whether through mass production, in-
teractive learning, or templates and methodologies that allow the re-use
and improvement of existing knowledge. Brian Arthur (page 23) asserts that
returns increase as you become successful in our world; the transition from
local to global may increase rather than dilute your market power. The
more important you are in the US, the more likely you are to succeed in
Russia. You don’t run out of resources as you get larger. It used to be
that you could grow by accumulating niche markets, but global is not just
local writ large or multiplied; it may be local intensified.

In the past, companies worried about products and features, market segments
and pricing, customer service. Now they worry about more complex issues:
business models and the very structure of commerce. They have to define
what it is they’re selling and what they want to be compensated for. Mass
markets are a thing of the past; the value gets added by the purchaser, so
the vendor has to be present for each customer to capture the value-added.

Companies are defined more by how they behave than by what they own. It
used to be an investor could invest in tangible assets: a factory, land or
perhaps intellectual property such as product designs. Now, more and more,
a company depends on the persistent performance of individual contributors
-- intellectual process, not intellectual property. Companies and con-
sumers want not just products, but relationships with their providers.

SCOTT COOK, INTUIT: LOCAL HERO

Scott Cook faces the future from a successful past. He is our industry’s
poster boy of success. Bill Gates, the industry’s hero of yesteryear, is
now a hero to the world at large, but Cook is still our hero -- the local
boy who made good in competition with a global competitor.

Why is he selling now? Basically, because you can’t succeed and be local
anymore. Intuit’s next step is to become a global company. Its customers
do not operate locally anymore; they do business worldwide, and they do
business with banks worldwide. To succeed, Intuit must make banks into
both partners and customers. But in the world of banks, Microsoft is a
niche player -- and Intuit is a gnat player.

Watching Intuit merge into Microsoft (if it happens) will be a
little like watching your daughter marry a tycoon. She tells
you it’s for love, and you hope it’s true. But somehow, you
have your doubts.

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Release 1.0

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By combining with Microsoft, its erstwhile enemy, Intuit can move forward faster in forging alliances with banks. When he spoke at PC Forum last year, Cook delicately noted that banks move slowly: "For those of you who've had the delight of working with the banking industry, that adds new meaning to the phrase 'legacy system'. 'Neanderthal' is, in some cases, a more appropriate term.... Don't expect [much] leadership from the banks." Over the past year, it became clear to Cook that while Intuit could survive nicely on its own, it could prosper as part of Microsoft.

Cook will discuss electronic commerce from his point of view -- a practical one of what makes the market. He sees it as "the overlap of two circles of what consumers really want and what the technology does really well."

"You have to figure out what in Procterland we'd call the missing customer benefit," says this former Crisco brand manager. And of course the customer is not just consumers but also banks. "I haven't met a financial institution that doesn't wish it had a closer relationship with customers," he continues. "They all yearn for that. But they borrowed from packaged goods: They do product management, so they manage products, not customers. Customers know only one product. For example, I've had a Citibank credit card for years and I have all these Citibank branches around me, but they've never asked me to become a customer for any other service."

The fundamental question, says Cook, was simple: "Do we want to be successful fish in a number of ponds, or do we want to really change the world? ...in many more countries and many more segments than we could by ourselves?" As for himself, he's not about to take the money and retire. "Personally, this is what I like doing, and now I can do it in a big way."

PANEL: ELECTRONIC COMMERCE GOES GLOBAL

Online commerce seems destined to turbocharge business and alter the dynamics of many markets. It will accelerate the pace at which individuals and organizations connect, communicate, negotiate and transact. It has already changed sales support and customer service. In its simplest form, electronic commerce means consumers enter more transaction information themselves and make connections to payment systems more rapidly and cheaply.

Underneath this straightforward aspect of electronic commerce lie other changes, some of them considerably more ominous -- or liberating, depending on your perspective. Financial functions will split, realign and reassemble (e.g., authorization and clearing); guarantors and other intermediaries will emerge and build thriving businesses off the new chaos and uncertainty. Jurisdiction, liability, ownership and other issues central to commerce will be forever changed. Borders that are now difficult to cross will be breached with impunity. Eventually, this plot goes, large portions of the economy will slip underground, avoiding taxmen and other prying eyes (see Release 1.0, 1-95).

Eric Hughes, Open Financial Networks: Money as math

Eric Hughes loves logic and structure. His longtime interests include program verification and correctness, formal logic, computational complexity, foundations of probability and the physics of computation. He also enjoys...
looking into the future of the global financial system. What he sees would
surprise most people in the business. What he is creating -- both in terms
of technology and structural frameworks -- may help his vision come to pass.

Hughes' interest in cryptography became a passion when he met David Chaum\textsuperscript{1}
worked with Chaum in Amsterdam for a while, but quickly left to follow his
own path. Hughes co-founded the crypto-lib group cypherpunks with Tim May
in 1992 and wrote the first anonymous remailer shortly thereafter on a dare.

Recently Hughes developed a new cryptographic key-exchange protocol which is
more appropriate for broadcast applications than previous protocols. He is
also working on cryptographic technology that would allow accounting books
to be audited remotely without giving the auditors access to all the infor-
mation in the books. An expert in developing legal structures to support
cryptographic transaction systems, Hughes is also a careful study of the
evolution of payment systems and currencies. These capabilities could one
day form the foundation of a cryptography-based banking system. Hughes will
be the guest author of a future issue of Release 1.0.

Now Hughes is a payment-system designer. His company, Open Financial
Networks, is working on transaction systems with open standards and open ac-
cess. Hughes' goal is to create an alternative system to the current ones,
which would reduce the friction of negotiation, audits, clearing and other
necessary processes. It would allow smaller players to participate in the
electronic economy as micro businesses with minimal costs.

Mike Nelson, The White House: Here to help us!

Mike Nelson earned a PhD in geophysics from MIT. The experience served him
well: "Government processes are like plate tectonics. Having a sense of
geological time helps you maintain perspective." He spent a lot of time
traveling around the southwestern deserts, in fact, so he should feel right
at home in Phoenix.

He also feels right at home in much of the world, since he currently spends
almost all his time on the Clinton administration's Global Information
Infrastructure initiative; in the past year he has visited four continents
several times, and will be arriving at the Forum fresh from the Brussels G-7
meeting. He has worked with Al Gore on science and technology policy for
more than seven years, starting as a staffer on the Senate Commerce Commit-
tee's Subcommittee on Science, Technology and Space. He got there by way of
a one-year fellowship that blossomed into a permanent position. "I handled
earthquake research, global warming, ozone depletion, the Antarctic, biotech
and computers," he says. "By Congressional standards that made me a spe-
cialist." In 1992 voters gave Gore a promotion to the White House; Nelson
followed. Today he handles information technology, information policy and
telecommunications policy for the White House Office of Science and Technol-
ogy Policy, where he reports to Presidential Science Advisor Jack Gibbons.

\textsuperscript{1} Chaum is the founder and president of DigiCash, a company pioneering the
anonymous electronic payment system profiled in Release 1.0, 1-95.
About electronic commerce, digital cash and the like, he rejects assertions the government has ignored the issue: "We're working on all the underpinnings: digital signature standards, encryption, cheap affordable infrastructure, intellectual property rights. We have to lay the groundwork first!"

He has top-level security clearance and is frequently the government's point man on the Clipper chip. Precisely because you can engage him in a reasonable discussion, he tends to get more of the grief about it than less flexible government spokespeople. "When you talk about electronic commerce, don't forget to mention money-laundering, terrorists, drug dealers," he reminds us. "You've got to worry about these things, too." Personally, intellectually, he is also intrigued with the notion of electronic commerce without money -- "where what you're trading is prestige and fame." (See Release 1.0, 3-93 and 12-94.)

You could argue that most non-government forms of currency will lack credibility -- although there are certainly many governments around the world with poorer credit ratings, than, say, GE Credit or even AT&T. Anyone extending credit to a friend is de facto creating liquidity (though not usually currency). Once again, the local-global world calls into question all the established practices born in a world of physical constraints. Why should Russians use the ruble for electronic commerce, when dollars or Magicash (for example) are as easy to manipulate -- and Magicash may be easier to hide?

What is the government in fact thinking about these issues? Would it like to put transaction amount limits on electronic cash? Or create a kind of ClipperCash system that allows anonymous transactions with a back-door for law enforcement? Will anonymous cash be worth anything without an approving legal system to enforce contracts made with such "currency"? "Sorry, you paid for it with Magicash; you can't force me to repair it!"

JIM MANZI, LOTUS: THE NEW FEDERALISM

Jim Manzi is one of the few ceos in this business to last more than one generation. That doesn't mean he can relax; it just means he has to solve new problems. He has moved the company onwards from dependence on 1-2-3 to a new, still bottom-light foundation on Lotus Notes. His challenge now is to get the world papered over with Notes before anyone else can grab the space. To do so, he has shifted from the high-end marketing approach of a couple of years ago to a more mass-market strategy. He's also forging alliances with communication platform vendors such as AT&T: You can now buy Notes as a service if you don't want it as a product.

Manzi hasn't yet survived the second generation -- but at least he's still in the game. He's often criticized by self-styled insiders for lacking technical vision, but his strength is business vision. More than any of his competitors -- and well before them! -- he understood the power of communications that could be made possible by Notes. That is not point-to-point communications, nor broadcasting, but a web, where each point is connected two-way to each other point. The intervening applications incorporate the business rules and policies of the company; the content they distribute is the current, continually updated specifics of customer and competitor activities, internal memos, follow-up reports, pricing plans and the like.
OPEN COMMERCE

Everyone knows about flatter organizations, virtual corporations, telecommuting and the like. But how does the new age play out in texture as opposed to structure?

The short answer is that companies will -- must -- become more visible. More of what any company sells will comprise information -- whether it's plain data, news and analysis, technical support, consulting services, design services, interactive entertainment or competitive intelligence. Some people will sell information-rich products; others in the chain will add information-based value.

Of course, there will be contracts between supplier and customer, but in a knowledge-based world the quality of those relationships will matter more than the contractual conditions (as in a marriage).

Indeed, the best cement for a virtual corporation is a two-way flow of information -- or visibility. Companies will try to find partners not by offering discounts but by sharing wisdom and information about themselves. In order to make their wisdom credible, they will have to be self-revealing.

Moreover, whether or not a company itself chooses to be visible, it will be. Companies can't hide. And the image they project -- on a Web home page or elsewhere -- will and should be true. Take the model of Reebok (described in the section on Adam Curry, page 20).

Dun & Bradstreet reports and similar information sources aren't the only reason companies can't hide. Employees will be visible to outsiders...and they won't stay if they aren't allowed to be. It's not just outsiders peering in; it's employees out in the electronic world receiving as well as giving. As physical and intellectual commodities lose their value, interactions with the outside world will be what a firm sells.

Furthermore, partners will influence and feel part of the decisions their partners make, even though companies will not necessarily allow outsiders into the formal decision-making process per se. By being not just transparent but interacting two-way, such companies will in fact make better decisions.

More and more, companies will be judged by how they operate, not by the products they produce from an opaque monolith. People care: How do you treat your people? Do you pollute? Or (with somewhat more direct self-interest), can I trust your employees not to reveal confidential data? Can I trust your employees' judgment when they evaluate my medical records, teach my children, fix my car, fly the plane I ride in? What is their drug-testing policy? Why is my plane late?

People want to buy information-based services and products from visible companies that operate as partners. They do not want commodity products from black boxes.
Manzi will talk about what he calls "the new federalism." A key notion, he points out, is subsidiarity, and the fundamental truth that smaller units are more responsive and adaptive than larger ones. All this is made possible by networks, since otherwise you need central control to keep order. (It becomes even more complicated when these networks operate across legal boundaries.) In the end, information is a stronger but more adaptive glue than legal contracts. The tough questions come when both are operating in parallel but not necessarily in synch.

GERHARD SCHULMEYER, SIEMENS NIXDORF: FOREIGN BODY

Gerhard Schulmeyer was born and raised in Germany. He rose through the ranks at Braun in Germany for 10 years, and in 1974 moved to its newly acquired subsidiary Gillette in Boston for a year before returning to Europe (Austria, still with Braun). Evidently he liked the US, because in 1980 he returned to run Motorola's automotive and industrial electronics group. In 1986 he became evp and a deputy to the ceo, responsible for European business. In order to avoid returning to Europe, he joined the US office of ABB, the Swedish-Swiss multinational that keeps getting written up in business journals for its lean headquarters and its ability to operate successfully all over the world with strong local autonomy. He is especially proud of having run the all-Americas activity of ABB while also serving as a member of the worldwide ABB board based in Zurich.

That worked out fine until he got an offer he couldn't refuse: to return to Germany to run Siemens Nixdorf, the $7.5-billion computer subsidiary of Germany's leading industrial giant, Siemens. The idea wasn't simply to run it, of course, but to transform it -- and to turn its diminishing losses into profits.

Siemens Nixdorf is the result of the 1990 merger between mainframe maker Siemens and Nixdorf, a mini-maker probably closest in character to Data General among US vendors. Siemens Nixdorf is tremendously powerful locally -- in Germany -- with about 14 percent market share of the overall IT business, but it has trouble gaining share in any other country. Two-thirds of its revenues come from Germany; Schulmeyer's goal is to halve that -- or to double the other percentages to one-third of revenues from the rest of Europe and one-third from the rest of the world.

Basically, the company suffers from many of the same ills that beset IBM: Too much success has made it unresponsive to the changing marketplace outside. The acquisition of Nixdorf was a smart technical move; management noticed the advent of the minicomputer, but the two cultures clashed. Siemens now has a substantial pc business, but it sells those pcs mostly to its traditional clientele.

Perhaps Siemens Nixdorf's biggest problem is its extremely profitable parent company, Siemens, which is a world leader in everything from engines and power-plant turbines to medical equipment and telecommunications gear. This has allowed Siemens Nixdorf to avoid the stock-market discipline that finally affected IBM. When Schulmeyer arrived, he found a headquarters staff of 1400 that he has trimmed -- or rather, that trimmed itself at his suggestion -- down to about 400 currently.

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But as Schumeyer understands, the issue is not numbers but culture. One of his more clever tactics was the following: He gathered 75 top managers and 300 "opinion leaders" (up-and-coming staff and junior managers) and asked them to come up with 60 tangible projects that could be implemented within three months (that is, just about now). The tasks ranged from reducing the time to process an invoice from one month to one week, to getting all top managers onto e-mail, to a marketing campaign. Then he asked juniors to form teams and to find senior sponsors. Some seniors were sought out; others went to a team and offered their support.

"The radical shift is that it was a complete sharing," says Mark Maletz, a cultural-change specialist Schumeyer brought in who earlier worked his magic at places such as American Airlines and Xerox. Rather than being assigned, both sides had to find each other.

How does one become an opinion leader at SNI? Basically, all you have to do is volunteer, and post something about the culture change and what you'd like to do. There's a database and people who turn it around and send it to people who might be interested. Some people in the company who are technologists have volunteered to develop a system to do this. Of course, they might also choose Notes, in a complete rejection of the NIH spirit.

Schumeyer's task is to break the company's strong local culture -- a combination of German hierarchy and Siemens' own unique smugness born of long years of success. He has a challenge -- and a five-year commitment from Siemens' board. Naturally enough, the rest of the tight-knit German business community is watching with interest -- and perhaps some horror. These are people who are probably both envious, and not necessarily eager to see such a blunt approach succeed.

PANEL: LOCAL <-- GLOBAL ENTERPRISES

Manzi's company sells what Schumeyer's company needs: a tool to foster communication among all levels of a company, and out into the rest of the world. Yes, there's a vision of the world that says that most professional employees will be journeymen, willing to work for the highest bidder on the most interesting job. But there's something in people that makes them like to join communities. We believe that the most successful companies will rely on group as well as individual creativity, that teamwork will still matter. In the world of virtual corporations, how do companies create a community that is real -- that keeps people together, that lets them learn from each other and apply that learning together? It's great to form a virtual bond with your customers and suppliers, but how do you form a virtual boundary to keep your best people inside? Or should you not even try?

How much of the success of Notes is due to the spirit in which it is implemented? How can Lotus control that? If you believe that software prices are going to continue to fall, then shouldn't Lotus get into the consulting business? And shouldn't Siemens focus more on account control and leave pcs and such to Intel?

Many companies in the US -- and in the audience -- generate more than 50 percent of their revenues outside the US. Yet few of their ceos or marketing people have much international experience -- with the notable exceptions...
of Alex Mandl, Philippe Kahn, Eckhard Pfeiffer, Andy Grove (in his childhood), Mike Spindler, Philippe Courtot, Eric Benhamou and Robb Wilmot.

So far, American computer technology has sold well throughout the world -- especially when it was made by local companies such as Siemens. But as the value-added in technology systems moves from hardware to systems software to tools and business applications, the cultural component becomes more important. It's easy enough to build a spreadsheet that handles local character sets and sorting sequences, but a little harder to build a word-processor that follows local hyphenation rules. It's even more difficult to localize, say, an accounting package or a sales-tracking system. What are the local rules for letter-writing? One country's gentle plea for payment may be another country's threat. One country's itemizable deduction may be another country's illegal bribe.

As the software business becomes closer and closer to users -- cf. Microsoft Bob -- software localization will become more and more challenging. How much of Reed Elsevier's content does it translate -- and will that proportion have to increase as its markets become more global?

On the consumer side, do customers eagerly adopt foreign stuff -- as the French government clearly is afraid French people do? It seems consumers may be more eager to try foreign culture than business people, who have a fixed way of doing things that has worked. Business leaders may have gotten to the top by following the rules or breaking them carefully.

Furthermore, the problems of managing companies across cultures are great. The trick is to have a strong corporate culture -- and a common language -- that can still accommodate a variety of national cultures.

On a more practical side, there are legal issues: export license for encryption technology, differential taxation, use of offshore programming teams. Who pays the taxes when someone in Tokyo hires someone in India to write an application using a computer based in Barbados with tools downloaded from Seattle for a client in Zurich?

Neville Cusworth, Reed-Elsevier: Three-centered man

Neville Cusworth read law at Oxford, but he sees the world as a businessman. He runs Reed Elsevier's legal division, about a tenth of its worldwide revenues (of about $4 billion last year). That includes British legal publisher Butterworths, which acts as overseas agent for the newly acquired Lexis-Nexis and its subsidiaries, including Forum presenter Folio Corporation (see page 38), US legal publisher Michie, and Jurisoft. It also includes French legal publisher Editions de Juris-Classeur. In addition, Cusworth is a member of the transition team for the Lexis-Nexis merger, which fits closely into his part of the overall Reed Elsevier business. He is based in London and currently also in Dayton, Ohio -- and soon, he notes, in Amsterdam, since he will join the board of Elsevier in April. He began his career at Butterworths in 1967.

Reed Elsevier is a giant experiment in cross-national operations. It's no accident that it's Dutch and English -- both nationalities fairly open to outside influence. Reed Elsevier's mission with the acquisition of Lexis-Nexis is both expansion in the US market and absorption of the Lexis-Nexis
technology expertise into Reed Elsevier's operations worldwide. The company's stronghold is in Western Europe, with legal, medical scientific and business publications, but it also publishes in Polish, Malaysian Bahasa, Afrikaans, and in Spanish in Puerto Rico.

"When you ask where does the head of international sit," Cusworth says, referring to the Forum agenda, "it doesn't make sense for us because we're all international." The company language is English, he notes, but that doesn't make it mono-cultural. Even among the native English speakers, most people speak another language and can roughly understand one or two others. Cusworth himself was born in Germany and spent considerable time there; he also speaks French and understands some Spanish. "If we hadn't acquired Lexis-Nexis, Dutch would have been next on my agenda."

Cusworth headed the company's technology task force, guiding the integration of the various technologies and expertise Reed Elsevier now controls. In addition to its new US holdings, it owns Reed Technology and Information Services, a publishing-oriented systems integrator with particular CD ROM expertise, and holds a minority share in Compliance Ltd., a smaller company that started out doing securities filings and now specializes in designing CD ROM front-ends. That doesn't mean Cusworth is designing any technology, but he's involved in helping to cross-fertilize the company's various divisions. For example, he doesn't yet use e-mail, although his secretary already does. "But now that I'm three-centered, I will."

MONDAY DINNER - STEVE HAYDEN
Dr. StrangeAd: Or, how I stopped worrying and learned to love IBM

Steve Hayden is in charge of the entire IBM account at Ogilvy & Mather. Interestingly, this is not just the pc business, but the whole company. That is part of the appeal; IBM isn't selling just products, but the company that provides them. Products now consist of design, support, upgrades...all the stuff you don't get in the box.

I first met Steve when he was still a slightly insecure creative guy at Chiat/Day, writing copy for the Apple account. The ads were like Hayden: funny, but with an edge. They were written about -- and to appeal to -- the kind of rising exec who played basketball on his lunch hour and then worked late into the night. Who wouldn't want to be like that? Hopeful but not naive, aggressive but not nasty -- someone who wants to get ahead and believes you get ahead on merit. Hayden is best known for conceiving the famous 1984 Macintosh ad (which still gives me goose bumps), and for insisting that it run when even the client had doubts. Later, of course, he produced the lemmings ad, which he calls proof of Karmic balance, and which implicitly portrayed IBM customers (not IBM itself) as lemmings.

What made Hayden, who later moved to BBDO and brought the Apple business there with him, switch agency and client?

"IBM now is a little like New York after it went bankrupt; it's still a great city," says Hayden, who gladly moved with his novelist wife Ann Taylor from Los Angeles to New York. "It still has all that cultural wealth, all that intellectual capital. The city got greater after it was humiliated a bit. The old image and the old model can't do it all."
"Gerstner's right," he continues. "If we split it up into fragments, what would be left? Just a bunch of nice little companies with not much edge. There's still a place in the world for one big technology company that does it all and has the wherewithal to invest in R&D. And from my perspective, it was an unprecedented event in advertising -- there has never before been a consolidation of that size. For me, IBM's problems are irresistible... opportunities."

Microsoft Clarifies Trademark Policies

REDMOND, Washington, January 4, 1995 -- In response to customer inquiries, Microsoft today clarified the licensing policy for Bob™, its new software product designed for computer beginners. Contrary to rumors, Microsoft will not demand that all persons formerly named "Bob" immediately select new first names.

"I don't know where these rumors come from," commented Steve Ballmer, Microsoft Executive Vice President for Worldwide Sales and Support. "It's ridiculous to think Microsoft would force people outside the computer industry to change their names. We won't, and our licensing policies for people within the industry will be so reasonable that the Justice Department could never question them."

Ballmer said employees of other computer firms will be given an opportunity to select new names, and will be offered a licensing option allowing them to continue using their former names at very low cost.

The new licensing program, called Microsoft TrueName™, offers persons who want to continue being known by the name Bob the option of doing so, with the payment of a small monthly licensing fee and upon signing a release form promising never to use OpenDoc. As an added bonus, Bob™ name licensees will also be authorized to display the Windows 95 logo on their bodies.

Persons choosing not to license the Bob™ name will be given a 60-day grace period during which they can select another related name. "We're being very lenient in our enforcement of the Bob™ trademark," said Bill Neukom, Microsoft's Senior Vice President of Law and Corporate Affairs. "People are still free to call themselves Robert, Robby, or even Rob. Bobby however is derivative of Microsoft's trademark and obviously can't be allowed."

Microsoft also announced today that Bob™ Harbold, its Executive Vice President and Chief Operating Officer, has become the first Microsoft TrueName™ licensee and will have the Windows 95 logo tattooed to his forehead.
The world will run differently once it's truly interconnected. It will take our habits and laws some time to catch up...

MORT ROSENTHAL, CORPORATE SOFTWARE: SOFTWARE HELPER

Corporate Software, with revenues of $600-700 million in 1994, adds value to packaged software. It not only resells copies; it also administers usage- or user-based licenses, manages system administration, version control and configuration for customers. In addition, it supports many users directly for a fee, and acts behind the scenes as the support department for many well-known software vendors (paid by the vendors). It has an advantage in this business for two main reasons: Its employees know the products of several vendors, and can handle typical customer problems which occur when two vendors' products clash. And its employees are first-class citizens and take pride in their work, whereas in product companies support people are usually relegated to secondary status with no hopes for advancement.

Support is everything from technical knowledge to sheer logistics -- managing licenses and upgrades and configurations. Corporate Software is outsourcing not projects and applications, but the nitty-gritty, boring tasks of managing software and even hardware resources.

When all these systems were unique, there were no economies to having an outside firm do the job; anyone's techies were as good as anyone else's -- and it helped to have them close by. Moreover, most of these techies weren't properly cost-accounted for; they were the junior account manager who had learned VisiCalc at B-school, or the graphic artist who had a way with Macs. The production these people lost by helping out their computer-illiterate colleagues they made up at night -- or by using their own computers so effectively that the loss was not apparent.

But one MBA can't support an entire company's worth of spreadsheet users, and gradually pc support groups grew up separately from MIS -- leading the battle that has preoccupied Computerworld/Datamation and PC Week from different camps over the last few years. Meanwhile, as pcs proliferated, companies discovered the need to distribute their own software products internally, and to handle the same tasks of version control, upgrade, configuration and management and the like as apply to purchased products.

The observer might wonder whether Corporate Software is outsourcing (in the traditional sense), or whether it's taking over the core competence and value-added of many of the suppliers for whom it is providing support. Indeed, the intermediary is starting to add more value than either end. Explains Rosenthal: "Certain things can't be done well at either end. It's many-to-many; customers optimize for their side, and vendors for theirs. No customer is big enough to get a vendor to standardize all its licensing agreements for that customer [unlike say, the sway of certain auto-makers in the auto-parts business]. Likewise, no customer buys from only one vendor [sorry, IBM]." But Rosenthal's goal is to get as many organizations as possible from either side to work through Corporate Software.

Adds Lori Fena, vp business development, "Customers are trying to create coalitions, but they don't seem to work out. Maybe it's because in the end
they don't have the economic incentive we do. We're not trying to get a
better deal for one party; we're trying to get the best deal for them all."

A story we're proud to tell: Fena spoke at PC Forum last year, and was
"discovered" by Mort Rosenthal (among others). Shortly thereafter, Corpo-
rate Software acquired and absorbed her firm, Technology Board of Trade,
which specialized in technology licensing and related activities.

JOHN WARNOCK, ADOBE: THE COVER DOES MAKE THE BOOK

John Warnock is the creator of PostScript, and the creator of the company
behind Acrobat. PostScript is a language for talking to printers; Acrobat
is a system for defining and maintaining the sanctity of a page. While many
other systems allow you to represent content in a way most suitable to the
local medium (word-wrapping, aspect ratios and the like), Acrobat takes it
as a given that the original creator had a precise look in mind, and pre-
serves it. (However, it does allow for some content-oriented activities,
such as searching and indexing.) In the cold war between content provider
and content distributor, Warnock is on the side of the provider.

In short, content providers may be more interested in preserving the iden-
tity of their content than in selling it (although both may matter). Thus,
for example, most newspapers use a style of font and layout and overall look
that is recognizable to their readers; the Financial Times, the New York Ob-
server and Russia's Financial Izvestia all use salmon paper; other papers
use green. For example, Release 1.0 publisher Daphne Kis insists that
people buy reprints rather than pay to make photocopies (even at the same
price), in order to preserve the newsletter's image.

Advertisers and content providers alike want to maintain an identity -- ei-
ther as a brand name for the IP they're selling, or to link their free IP to
some charged-for service or product. On the other hand, online providers
want all their screens to look the same; they want you to see the content
through their window. It's the same as the war between Intel and Compaq, or
Nordstrom's and Ann Klein.

PANEL: INTELLECTUAL PROPERTY ON THE NET

In new world of the net, competing with the old one, it will be easy to copy
information, but hard to find it and certify it. The economic rules con-
cerning intellectual property will change, regardless of what happens to the
legal rules. The result is that there will be a premium on identifiable in-
formation and people. (See Release 1.0, 12-94.)

The information provider's job, then, is to give information a particular
look; the person's task is somehow to create and project an identity, real
or no. The intrinsic value of content in the aggregate will remain high,
but most individual items will have a short commercial half-life on the net
-- or they will have to be carefully preserved and controlled in order to
prevent "radioactive" decay. The problem for providers of intellectual
property is that although under law (so far) they can control the pricing
and distribution of their own products, they will operate in an increasingly
competitive marketplace where much intellectual property is distributed free
and the number of suppliers is exploding.
While content won't be entirely free, the economic dynamics will tend to make companies successful who behave as if it is. Yet high-value software will retain its premium pricing -- especially if it is maintained and sold carefully through schemes such as those suggested by Gabor Bojar.

Gabor Bojar, Graphisoft: Intellectual service for sale

Gabor Bojar is Hungary's best-known software tycoon; actually, he's Hungary's only software tycoon. But in character he's a lot closer to Mitch Kapor than to Bill Gates. He and his partner started in business in the early 80s with a programmable HP calculator with 2K of memory. They worked out of an attic; few Hungarians had garages in those days -- or cars. He and a partner were trying to win a bid to write software for a contract with a Hungarian engineering company. The task was to retrofit a Soviet-built nuclear power plant to newer Hungarian standards. The competition was the Technical University of Budapest, Sztaki (a scientific institute), and Videoton (a large state manufacturer that foundered and was eventually acquired by Bull).

Bojar and his team knew that they had no chance of winning the bid with a proposal; instead, they wrote the software and then went ahead and produced the actual design drawings. The $30,000 they received for that effort (winning the bid against competing proposals for ten times that amount) funded Graphisoft, one of Hungary's first truly private companies. A few years later, Bojar saw a Macintosh at CeBIT (the Comdex of Europe), and Graphisoft's ArchiCAD soon became the leading architecture-oriented CAD package worldwide for the Mac. The Windows version is heading to the same position.

Along the way, Bojar founded, built and sold Apple's distribution business in Hungary, under the name of Graphisoft Trading, but the software business remains his major concern. One issue that has always troubled him is ArchiCAD's high cost (of $5000 to $10,000): It's appropriate to the package's value, but it's daunting to many prospective customers. The notion of free trials or "lite" versions didn't appeal to him, but he wondered how customers might react to the notion of usage-based pricing, where a customer would pay by the hour. That led to Graphisoft's trademarked PayPerUse scheme. Recently, he has tried it out on about 60 customers; within three months, a third of them have already become regular users and generated follow-on revenues. (The tests were all in the US, he notes, because our credit card system makes payment so much easier.)

The system begins with a $295 starter kit; it includes the software, a counter (which the software needs in order to run) and the first 50 hours of use. The user can order incremental time by phoning an 800 number with a credit card. From that point, the user pays $3.83 per hour.

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2 He cites the reasons eloquently: The balance and integrity of the software is endangered; any good entry software should be designed to be entry-level rather than a dumbed-down high level. Moreover, precisely those features that make the high-end package valuable are left out, it's hard to introduce the user to them. Besides, the "light" version is obviously a decoy and customers do not like it. With relish, he cites numerous examples of cheap CAD software that didn't make it.

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The benefits (carefully thought out by Bojar) include more than a lower up-front cost. Light users pay less; heavy users (presumably less price-conscious people who depend on the software) pay more. This has a certain equity to it. Moreover, since revenues continue as customers use the software, there's an incentive for dealers (who get continuing commissions) to support the software. The whole system focuses on use rather than purchase.

From the customer's point of view, there's much less start-up investment and lower risk. Even nicer, the customer can assign the costs to a specific project and bill its client in turn...and you can mark it up!

As we noted in Release 1.0, 12-94, the customer is paying for intellectual service or process rather than intellectual property. Of course, it's being measured as time. Bojar, a scientist with a penchant for perfection, keeps trying to think of even better -- or more relevant -- ways of charging: perhaps by design produced, or by number of rooms created -- or even per dollar of real estate designed. He considers unit market share to be a specious measure, and would prefer to quantify his success in terms of hours of use or at least dollars. He proudly points to Osaka Airport, Genoa's leading new office building, the new exhibition hall in Hanover and the Hungarian Exhibition Hall in Seville as items designed with ArchiCAD.

Jim Clark, Netscape: Changing the landscape

From Jim Clark's success in business, you'd never guess that he's a former college professor, and of computer science, no less. But he left all that behind in 1981 to found Silicon Graphics, a company that is now kicking up its heels after years of being in Sun's shadow. And Clark is now kicking up his heels after years of being in SGI's shadow.

As founder and chairman, he's in the thick of things again with Netscape Communications (nee Mosaic Software), provider of the Internet's leading Web browser, Netscape Navigator (estimated 70 percent market share). That, however, is simply the free product with which Netscape advertises its real jewel, the Netscape server (browser support costs $39 for 90 days). The server provides links to an expanding array of services including data management, transaction management (with MasterCard/BankAmerica), text search and the like; the high-end $5000 version offers RSA security. Server and browser both are part of MCI's internetMCI offering (see page 24); other OEM customers include Delphi, Digital and (of course) SGI. Novell is bundling the browser with its suite of OEM tools. "We're actually making money on the browser," says Clark with some amazement, "because a lot of companies don't want their people wasting time using it without support."

Clark has collected the cream of the crop in technical and business talent: Marc Andreessen wrote the original Mosaic browser for the National Center for Supercomputing Applications; note that the Netscape version is all new code, and faster. New ceo Jim Barksdale hails from Federal Express (where he was coo and spoke at the 1984 PC Forum) and McGaw Cellular/AT&T Wireless; he did a stellar job at both companies. Venture capital comes from Kleiner Perkins exclusively, and John Doerr sits on the board.

Of course, Netscape faces a market where Web clients and servers will quickly become commodities. It starts out with the best team in the business; now comes the tough part. Says Clark: "We've got a market that's wide open;
it's a huge void and a lot of people are rushing in. We're not just an early-stage company; we're in an early-stage market. If we can take 70 percent in a few months, presumably someone could come in and do the same to us. The best insurance in the computer business is an installed base, so we need to figure out some way to keep them loyal to us. Where we add value will be the payment-system interface and the back-end services."

BOB KAVNER, CREATIVE ARTISTS: LOCAL BOY MAKES GOOD IN HOLLYWOOD

Kavner, formerly evp and Multimedia ceo with AT&T, has started a new life as a member of the staff of the Creative Artists agency. No one has titles there -- not Michael Ovitz, not the most junior file clerk -- but suffice it to say he's closer to Ovitz than to the file clerk. The company is an anomaly in the midst of Hollywood, says Kavner, and insists on teamwork rather than colorful individuality. "The culture of Creative Artists has nothing to do with Hollywood," he says. "People wear suits and white shirts; it's a very conservative organization. We don't pretend to be our clients. It's sort of a break. You'd expect gold chains; we sell creative ideas, but in this professional way."

Kavner heads the firm's consulting practice, a group of about a dozen, on a par with the agency that represents talent and with the literary group that develops and packages properties combining screenplays, talent and other assets. Clerics and assignments include Matsushita, Sony and its acquisition of Columbia, advertising work for Coke, lots of all-around consulting focusing on branding, positioning, entertainment and the like. The most famous deal, and the one Kavner spearheaded, is the recent consortium of Nynex, Bell Atlantic and Pacific Tel, which will deliver video dialtone and content. People have been waiting for this one to take shape -- and now it will, under new ceo Howard Stringer, formerly president of the CBS network. "A few years ago you would never have imagined that the head of a network would run a media company for a bunch of phone companies," says Kavner. Quite a coup, Bob!

Even though CAA doesn't publicly identify its "talent," they are known to include Steve Spielberg, Oliver Stone, Ivan Reitman, Michael Crichton, Madonna, Whoopi Goldberg, Robert de Niro, "" (the artist formerly known as Prince), Robin Williams and Danny de Vito.

Many Hollywood people are fascinated with the technology, says Kavner, who works with the firm's other groups in introducing technology to its clients. "There are a good number of creative people -- directors, actors, writers -- who want to work in new media, set up companies for themselves. The younger talent look at this as their primary market. For example, Brett Leonard, even though he's known for directing movies [such as "Lawnmower Man"], he's really interested in making CD ROMs and doing online services."

Over the last six months, Kavner and his team have met with several hundred clients to give them briefings on new media. "Our goal is to help them use the technology that the people [in the Forum audience] are making possible," says Kavner. "We're in a major educational process." Some of them have never seen a CD ROM or online service; others, such as Robin Williams, are already part of the computer community.
Meanwhile, Kavner is learning a lot in Hollywood that they never taught him at CPA school or at AT&T, for that matter: story-line development, character development, pacing. "It's a profession and an art form that goes back to the beginning of time," he says. From Kavner, the Hollywood community may gain a new way of telling stories. On the other hand, the tech community may learn there's more to entertainment than shoot-em-ups and tunnels.

PANEL: VIRTUAL PLACES AND PEOPLE

As we pointed out at last year's Forum, interactivity in the electronic realm isn't merely about people collecting information or ordering products. It also -- especially -- concerns people interacting with each other. A key aspect of those interactions is where they take place. One of the advantages of the online world over the telephone and TV networks is the potential for persistent spaces of many kinds. Some successful online destinations are merely plain-text message threads, such as Echo, the WELL, online-service forums and Internet newsgroups. A few provide textual descriptions of multi-user environments, such as MUDs and MOOs.

Highly visual virtual spaces are booming. They offer participants cartoon or realistic, 2D or 3D characters (often called avatars) that they can steer through landscapes of varying realism to interact with other avatars. This year's Rumpus Room features several flavors of these visual spaces (see page 43) that we hope you will explore.

But there is more to the construction of satisfying virtual spaces than choosing a VR protocol and a scene-description language, or even choosing what style, look and tone to give the space. This other stuff is the nutrient agar of virtual spaces: the norms, behaviors, expressions, passion, benefits, payment mechanisms, look and feel, content, attitude and navigation tools. What motivates people to try a place out, then return and participate consistently? What relationships do people build online? Do they tell each other stories about their activities? Building great places involves loyalty, safety and trust -- and sometimes chaos, randomness and loss. Different audiences will gravitate toward different spaces. Individuals may participate in several different spaces.

Getting the mix right is difficult. It's like nurturing a salon. Service providers who can't get it right will remain access providers: Subscribers will use their gateways to find other interesting places to be. Some service providers succeed in small markets, but can't make the leap to mass markets -- or don't want to.

Vendors face social and commercial issues such as: How can virtual spaces be differentiated? How do time and space work in a virtual space? What separates a space from a community? How are communities redefined by global access? What are useful models of governance? How selective should hosts be? Are hosts necessary? Does exclusivity pay? How will these spaces be

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3 For discussions of multi-user virtual environments and community issues, see Release 1.0, 6-93, 7-93, 6-94 and 7/8-94.
used in business? What is the proper role of anonymity? If spaces grow too large, do they lose whatever makes them work, or is there a way to subdivide and keep it moving? What scale works? What is a "starter" for good virtual spaces? Is it possible to set initial conditions that favor unpredictable, emergent behaviors that move in non-destructive directions?

Sherry Turkle, MIT: It’s 10 pm. Do you know who you are?

Sherry Turkle is a psychologist and professor of social studies of science and technology at MIT who has been exploring the subject of online personae. In the fall, Simon & Schuster will publish her new book, Life on the Screen: Identity in the Age of the Internet, which among other things describes her insights and experiences online in MUDs, MOOs and other virtual neighborhoods, and explores the culture of simulation.

I first met Turkle in 1989 when we traveled together to Russia (then the Soviet Union) to meet the Russian programming community. Turkle was then best-known as the author of "The Second Self: Computer and the Human Spirit," a book about the way computers give children a different view of the world from what pets gave to earlier generations. In short, the thesis is that children would compare themselves to pets and see themselves as intelligent and rational -- while pets and children were alike in being alive and emotional. When they compare themselves to computers, children see themselves as differing in their emotions and in being alive. That was when children mostly played with computers and computer games.

Now, children (and adults) are using computers to play and communicate with one another. For what it’s worth, kids don’t usually compare themselves to telephones; the telephone is just an instrument. Likewise, the computer is an instrument for communication, not a participant. But it’s taking on a new role -- as an active environment.

What’s new on the net is children’s (and adults’) ability to assume a variety of identities. Children can play make-believe without the cooperation or knowledge of others. Just as children used to give their dolls identities and can buy ready-made identities such as Barbie or Barney, so may people move from creating their own identities to buying ready-made ones (perhaps with customization tools).

In her research, Turkle has had many fascinating interactions with people exploring aspects of their character -- and even taking advantage of hers. One of the characters she ran into in a MUD was called "Dr. Sherry." Although it is understood in MUDs that a character named "Bill Clinton" is probably not the real item (what better disguise, then?), Turkle was faced with what might happen to her own online identity if someone ran around using her name irresponsibly. In a world where consistent behavior over time defines a person’s external identity (true, of course, in the real world as well), identity spoofing can cause serious problems.

Identity and relationships are central to people’s experiences in MUDs and MOOs. Manufactured identities are common online, and Turkle has interviewed many of the builders to cull their experiences and motivations. Some people with stalled real-world lives had created blossoming online careers (albeit unpaid ones), which they were eventually able to translate back to the real world (and paychecks). What are the implications of all this? What effect does it have on social behavior and on identity?

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Stewart Brand, Global Business Network: Still starry-eyed

Stewart Brand actually has gotten wiser -- and kinder -- as he has gotten older. He sits on three boards with me -- the Santa Fe Institute, the Electronic Frontier Foundation and the Global Business Network (where he's a principal). And he's trying to inveigle me to join another -- the Clock Library's (more below). Overall, Brand has had a hand in many of the more significant institutions of the new tech culture; in addition being part of the outfits above, he founded both the Whole Earth Catalogue and the WELL.

His experiences at the WELL affected him deeply; as is obvious now, it was a social, not a technical, experiment. Perhaps the most interesting experiment was allowing anonymity -- just for a short time. The results were so horrifying that he sighs: "It's the difference between a village and a city. A city thrives on anonymity; people go there to get away from the lack of anonymity. But in a village you can leave your door unlocked. The WELL and places like it that want to be a community just can't allow anonymity.

"The internet is a global city; the Well is like a village -- a volunteer, part-time village, just like you'd like your village to be. Everyone who's there wants to be there."

Pressed, he goes into details about his brushes with anonymity: "It actually happened twice. I saw it first on EIES [an early conference system]. A group I was in online was destroyed by anonymity. Someone taunted everyone by saying, 'You can't tell who I am; you're guessing but your guesses are wrong.' His ability to strike and not be struck back became the major event in that community and destroyed its trust forever."

Later on, after he had handed control of the WELL over to a successor, the issue came up again: "People said, 'There's things people really want to talk about and they can't talk about them frankly. Can we have a conference where anonymity is okay?' The WELL's software can do either. So we tried it, and people started pretending they were each other. Because people knew each other, it was easy to do. One woman was open and was easy to lampoon and someone did. She went ballistic. Other people were uncomfortable and it lasted only three to four days before being shut down, pretty much by mutual acclamation."

This experience brings him to the notion of pseudo-anonymity, where the participants don't know who's who but the sysop does, for accountability, authenticity and so on. "This goes into trusted systems and the like," says Brand. "On the WELL, it's easy to make up a handle -- an identity -- but your log-in ID is constant and visible. That combination seems to free up people just enough..."

Brand began his career with two years as a straight-leg infantry officer at Fort Dix in the early Sixties. Did you actually fight anyone? we asked. "Just a few senior officers. But it gave me all the skills that almost none of my generation had of being in charge of things. I was trained to manage people, time, myself. I didn't believe either side during the Vietnam War.

4 Anonymity is worth an issue of Release 1.0 all to itself.
so I stayed out of it. I was very pro-Gulf War, and getting involved in Haiti, and I wish we were doing more in Yugoslavia. My current bone with the Republicans is their flat-out, no-kidding isolationism; they would have kept us out of the Second World War. I just want to fight the bad guys. For example, I'm delighted they caught Mitnick."

And what about the Clock Library? It's a sort of forward-looking museum that is designed to focus people's attention on centuries rather than days or years. It's not predicting much of anything, except the certain passage of time. There has been a lot of net discussion about it: What should it do? Should it be living, so that it doesn't rust but instead adapts? Should it have an electronic library of all the world's wisdom (and what would that mean)? It could contain archives of all the open questions -- anything on this mystery or that mystery? -- and link in the answers as they appear: "Oh yes, this is what we thought about extra-terrestrial life before the Juanalicians appeared. Here's the identity of the Unibomber."

Brand wants to build it to live on after us all.

Adam Curry, On Ramp: Building communities, bit by bit

Adam Curry's twin passions of music and technology have brought him from his childhood home in Amsterdam, where at the age of 16 he hacked together a 300-baud modem for his Sinclair ZX-80 computer, to Manhattan, where he spent seven years at MTV and most recently launched an Internet-based startup called On Ramp. Curry is a longtime fan of online and bulletin-board services. During his stint as a veejay at MTV, he ran his own BBS and participated in music-related BBSes and forums worldwide.

In 1993, Curry created a file that others could read with the Internet "finger" command in his account on Panix, a New York-based Internet access provider. The file became so popular that it caused Panix problems. Curry switched providers, secured the Internet domain mtv.com, and set up a Gopher server that attracted 30- to 50,000 visits daily. The file everyone was after was Curry's CyberSleaze report, a gossipy, irreverent and entertaining 'zine that covers who's on tour, album and movie news and so on. It's now also available over e-mail and on the Web.

Curry decided he could have more impact harnessing technology than introducing music videos, so he quit. MTV contested his ownership and use of the domain name mtv.com and sued Curry. The suit is now settled. Curry then started the Metaverse (a play on "MTV" and an instantiation of the fictional Metaverse in Neal Stephenson's Snow Crash). Together with partners Ron Hartman and Gary Schoenfield, co-owners of Media America, a radio marketing and syndication company, Curry launched On Ramp. A week later they landed a project to create a Web presence for AT&T Consumer Products. On Ramp has 25 employees split between New York (sales and administration) and San Francisco (technical and creative).

On Ramp has also created online presences for Reebok, Universal Studios, Sprint, Bertelsman Music Group, RCA Classical and others. Planet Reebok is a good example of Curry's approach. In addition to information about Reebok's merchandise, the site includes an "Ask the Pros" section, where celebrity athletes and coaches respond to participants' questions, and forums for spontaneous exchange where visitors have asked about Reebok's labor policies and wage levels overseas. It also points to Reebok's "Wit-
ness" program, which supplies human-rights groups with faxes, video cameras and other tools. "Witness" is a venture with the Lawyer's Committee for Human Rights and musical artist Peter Gabriel. Curry wants to add bulletin-board features to foster more two-way communication.

Curry has many creative ideas of how to push the Internet both technically and socially. For example, Curry is a fan of VRML (page 44); On Ramp will soon add 3D rendering to the Universal Studio site. Also, On Ramp has developed an Internet tunneling protocol for live radio and has just received the first music license for cyberspace from BMI. "Getting on the Net is not a technical issue," says Curry. "Few people understand what's up. Ad agencies really screw it up; CD ROM designers aren't it; MIS people aren't right, either." Curry understands the social side of this phenomenon; he wants to build online communities. The Bud House of Beer that On Ramp created for Anheuser-Busch on the Web is not about beer; it's a social space.

Carol Peters, daVinci Time & Space: Playdates transformed

After a successful career as a workstation designer at DEC and Silicon Graphics, Carol Peters decided to balance the science and technology in her life with the art career she abandoned in her twenties. Now, as co-founder of daVinci Time & Space (dVT&S; see Release 1.0, 7/8-94), she is developing a new generation of organic virtual worlds for kids three to twelve. Our guess is that these spaces will appeal to broader audiences. It's one thing to go to the Discovery Zone and know you can never crawl through the tunnel or swing on the teensy swing; it's another to be a kid again online, where anything is possible.

Playing with possibilities is an exciting aspect of the multi-player spaces that dVT&S is creating. We can imagine active playgrounds where the swings have personality, or perhaps Transformer-style toys that kids can reconfigure. Kids can help each other learn how to use the software toys or join forces to play complex ones. There might be spaces with different physics, such as cartoon towns or a world with weirdly curved space. Playdates may never be the same.

A question dVT&S developers like to play with is: "How does Time work in a virtual Space?" If these design goals sound daunting, they are. The company's developers must constantly strike balances between safety and fun, cool technology and social behavior, control and complexity. Online spaces' designs need to be obvious. Kids can make friends by teaching each other the rules; that's how things happen in real-life playgrounds. Kids have pretty short attention spans. As Pong's inventor Nolan Bushnell says, "The first time somebody tries your game, you have 45 seconds to get the next quarter."

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5 Peters founded dVT&S in August 1993 with Jeff Apple, an experienced movie and TV-commercial producer. In recent news, the company added David Horowitz to its board of directors. He was formerly a member of Warner Communications' three-person executive office.

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Bob Frankenberg knows a lot about bridging local cultures. At HP, he worked for and helped extend a company known for its strong culture. The HP way still permeates many of the better companies in the Valley, through people such as Jim Treybig (Tandem), Bill Krause (3Com, Storm), Software Publishing (Fred Gibbons), Ed McCracken (Silicon Graphics), Ed Birss (Apple/Taligent) and Steve Wozniak, among others.

HP's culture also travels well across national boundaries; you can find the same spirit among HPers in places as diverse as England, Slovenia, Russia and Japan. In fact, it may be tougher to merge two companies in the same local neighborhood, with the same language -- and different meanings for words such as "quickly." Take, for example, Novell and WordPerfect: Perhaps because they lived in such close proximity, they aggressively established their separate identities within the seemingly tight Utah community. To outsiders, they may all look the same, but in Utah, WP and Novell had two different "ways." Just to start with, there are differences between a private company and a public one. One of Frankenberg's biggest advantages was that he came from neither culture; he inherited no biases and looked at everyone with fresh eyes.

"When you're built out of 23 tribes," he notes, there's quite a challenge to integrate a company as tightly as, say, the mostly home-grown HP. WordPerfect recently acquired Reference Software and SoftSolutions, and Novell has made 22 acquisitions over the years, including Software Transformation, Serius, DIgital Research and Excelan, and products such as MHS and Btrieve.

After the merger, Frankenberg says, "We should have moved even more quickly, removed the uncertainty. We should have let the healing process begin faster. On the other hand, we got the product out the door when people expected us to sit here arguing for two years. In the past, we spent 7000 [employee] hours decorating for Christmas."

On the product side, GroupWise, extended with Internet support and the like, is a good base -- much as Notes is Lotus' bulwark. More important in a world of commodities is Novell's complementary ability to be a good partner; as a platform and networking company, it has always had to work closely with third parties in a way that Lotus's desktop experience did not equip it for.

Frankenberg wants to focus more on making "truly global products." This is more than just double-byte enabling, he points out. You need to adjust the software to the customs and practices of local people. In this regard, Frankenberg says, he was pleasantly surprised. Despite the outside impression of insular Utah (read Mormon) culture, many of the company's top managers have gone on two-year missions outside the US. That's not quite the same as being a country manager, but it gives one a good sense of another culture -- and of the arbitrariness of US customs and habits of thought.

But you have to fill out the matrix of geographies and products carefully, notes Frankenberg: How many tiny markets should you pursue? What are the trade-offs between one market and another? Should you go for geographic breadth, or product depth in a smaller number of markets?

As for implementation, he continues, the plan is: "Globalize centrally, then localize locally." That is, make each product robust and flexible and
modifiable and parameterizable at your main development site(s). Then make the local tweaks locally, where you have people who know the local culture and marketplace. (Good news for local developers!)

W. BRIAN ARTHUR, SANTA FE INSTITUTE: SURF'S UP!

W. Brian Arthur is an economist with a genuine Irish accent who stands in the thick of the industry's greatest controversy: the Microsoft antitrust suit. He is a source of much of the economic argument in the famous anti-Microsoft white paper produced by law firm Wilson, Sonsini for a group of unidentified clients (but we can guess!). Of course, Arthur can't comment on much of it directly, and for now the case is dormant, he adds.

But his work informs much of the argument: Basically, the old economics of diminishing returns and equilibrium don't hold sway in the new world of software, standards and cyberspace. If you're mining iron ore, for example, or producing green beans, each incremental unit will cost more, because you will have worked the best veins of ore or the best fields first. Moreover, if you produce too much there will be a surfeit of iron or of green beans, and the market price will probably go down.

In the third-wave world, or cyberspace, or the software/information business (or whatever you want to call it), different rules apply. The successful producer gets increasing returns, because his product gains value from being widespread. It's the notion of telephones having a natural monopoly, updated. X is worth x, but 2X is worth x^2.

A winner can keep winning bigger and bigger by controlling the standard. None of this is too new to those of us in the computer business, of course, because we see it happening every day. But it's new to hear it lucidly explained by an economist -- and it's evidently new to the Justice Department, too. Of course, Arthur is somewhat of an iconoclast among economists; his PhD is actually in operations research from Berkeley; he also worked as a demographer for the Population Council in New York. All that is how he learned that the world is more complex than simple algebra would have it.

Specifically, Arthur is fascinated by the high-tech business. "It's like a fast-breaking ecology," he says. As for Microsoft, "They have plenty of pluses and minuses. At the very least I can say that they're smart. Who's the next industry dominator? I see this industry like surfing; there are waves of technology change. The wave of the pc: Microsoft (and Intel) surfed that better than anyone else. My best guess as to what the next wave would be is some form of banking-slash-software. I expect that in the next five to ten years, consumer banking will be superseded. There's no reason for me to hold an account in a traditional bank if there's someone else to hold my funds.

"Banks and insurance are the next regulated monopoly after the phone company," he continues. "Gates and Co. already have their eye on that market. I'm not sure they'll be able to dominate if there's enough outcry in the public." In short, while the government may be willing to cede the software business to Microsoft, it may have second thoughts when it comes to the power to control the money supply.

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"Platform" no longer means just DOS or UNIX, mainframe or mini, Oracle or Sybase. It also means ISDN or T1; virtual circuits or satellite links. Communications networks used to be channels between value-added systems; now they add value themselves, operating as application hosts and value-added intermediaries. What's the difference between an information network and a marketplace? Just a transaction system or two -- and a way of collecting tolls. And even design usually takes place among teams...

BERT ROBERTS, MCI: A FRIEND, ALMOST FAMILY

I know Bert Roberts primarily from watching him over the months on the NII Advisory Council, where we are both members. The Council started out somewhat formless, and without much direction. But after a couple of meetings, the two co-chairs, Ed McCracken (who spoke at last year's PC Forum) and Del Lewis, ceo of National Public Radio, gave us local problems instead of the global NII questions that had us all drowning in vagueness. As it happened, I became co-chair of the section (formally called a MegaProject) on privacy and intellectual property; Bert Roberts took on the group defining and making recommendations for universal access.

So I lost the chance to work with him closely, but I've enjoyed watching him in general sessions. For a successful businessman, he retains a fair amount of the troublemaker mentality. At the first Council meeting, he said, "If the Clipper chip isn't already dead, I'd be happy to assist the Advisory Council in putting the last few nails in the coffin and burying this stupid, unworkable concept once and for all."

In some ways, MCI is in the same position as Lotus. It sailed through the first round in great shape, carving out a substantial position in long-distance from the hide of AT&T. Now the market has changed, and MCI is facing new challenges.

Common opinion has it that the company has lost its way in wireless, but Roberts asserts that the company has maintained its freedom by avoiding entangling alliances with particular wireless providers. It came to that conclusion late in the game, after a long and fruitless courtship with Nextel.

Wrote Roberts through his favorite medium, MCI Mail: "We have not entered the insanity of the PCS auctions and have retained a flexibility that nearly every other company has lost -- the flexibility to talk to all organizations about resale, JVs, etc. Net net, our strategy is not to own wireless infrastructure, but rather, through resale of what we see as an abundance of competitive capacity coming down the pike in wireless, and packing products with MCI branding, we will actually be in the cat bird's seat in this area of the industry (and have preserved our financial muscle to go into other areas). This isn't to say that we'd never make any investment in wireless, but only to solidify a strategic relationship and not to own infrastructure per se. A close parallel to what I'm talking about is the paging area -- look at the recent announcements we made there. We don't own infrastructure, but we have packaged products available through resale."

MCI is doing a good job of taking hold in the internet market, although that's a necessity these days rather than a competitive advantage. The com-
pany is offering networkMCI Business, which includes internetMCI, MCI's one-stop shop for customers who want access to the net but don't know where to start. It includes an IP stack from FTP Software, a Web browser from Netscape and internet access in a single package. And there's marketplaceMCI, a mall where subscribers can advertise wares. It will be available in the Rumpus Room at the Forum (or in the privacy of your home, for that matter).

Illustrating our dictum that unique individuals are the scarcest resource, perhaps MCI's biggest recent coup is nabbing (back) Internet pioneer Vint Cerf, who is responsible for the design and development of the network architecture to support MCI's future data and information services.

Despite his bluntness, Roberts spends a lot of time in Washington -- and not just at MCI's Washington headquarters. That's why we've asked him to give an overview of where the government is heading with telecom policy and legislation. Along with Alex Mandl and Wayland Hicks, he cares about this.

Fundamentally, the pc and software businesses have been local businesses, interacting among themselves and with customers. Washington mattered only in the context of tax policy -- and the odd antitrust case against IBM or employee classification problem. Mostly, the industry has managed to stay away from the rest of the world. Roberts will explain how Washington matters in your neighborhood, whether you invite it in or not.

ALEX MANDL, AT&T: GLOBAL BRAND, LOCAL SERVICE

Formerly ceo of Sea-Land, one of the largest international shipping companies, Alex Mandl is an outsider at AT&T, and he is changing the company rather than being absorbed into it. Born in Vienna but mostly educated in the US, he brings to the job both an international and a customer perspective. Along with Bob Kavner (see page 16) and other outsiders who have since left, he has shifted the company's course dramatically.

Mandl's focus for AT&T is "fat minutes" -- adding value to the time people spend on AT&T's worldwide network, with enriched communications services and with the addition of applications/services such as Lotus Notes. The goal is not to supply communications time, but to outsource customers' communications applications and administration -- everything from running video conferences to managing servers that are hooked up to communications links.

Mandl gets things done. He turned AT&T's investment in McCaw into an outright acquisition. He pushed the long-distance business to be more aggressive and take market share back from MCI and Sprint, with impressive results. Often mentioned by outsiders as a possible successor to ceo Bob Allen, Mandl has plenty to do in the meantime. Called a "tough newcomer" in a Wall Street Journal article, he says, "Our challenge is to take advantage of our scale, but still act like a small company."

Remember, AT&T is the company that the government broke up in 1984 (as some people would like to do to Microsoft). After that, AT&T operated carefully, restricted from offering local phone service in the US. It changed its focus to overseas operations, where it was freer to expand, and eventually to value-added services. Now it seems on the point of becoming a dominating player all over again, but with more help from outside. Its recent alliances include Lotus, Novell, McCaw (an acquisition), Intel and Xerox, among others -- in fact, just about everyone except Microsoft and IBM.
Online, AT&T now has a grab-bag of ventures that include PersonaLink, EasyLink, Interchange, the ImagiNation Network and Network Notes. Notably, they include no landline local-access and limited Internet-access solutions, businesses that AT&T may choose to stay out of -- or invest in. Mandl's challenge now is to turn these and AT&T's wired and wireless voice networks into offerings that appeal to a wide variety of audiences that will pay it for their fat minutes.

WAYLAND HICKS, NEXTEL: HOW "LOCAL" CAN FOLLOW YOU AROUND

Wayland Hicks joined Nextel late last summer after 28 years at Xerox, where he saw the company through the conversion from analog to digital technology, with major market-share swings in between. Hicks believes that the convergence of computing and wireless communications is the driving force for the mobile workforce. He's convinced that work patterns and organizational structures are going through fundamental changes that will result in highly connected and self-sufficient mobile workers.

Hicks wants Nextel to offer the best services for that emerging workforce. In fact, he wants Nextel to live what its technology implies: virtual offices atop decentralized, communicating networks. He has set strict boundaries between regions and business units, then pushed responsibility out to the tendrils of the organization. Hicks has brought maturity to Nextel, reining in marketing and strengthening the link between customers and engineers. He is a strong builder of partnerships and spends a lot of time with Motorola, one of Nextel's key suppliers and a 24-percent owner.

Nextel was originally a small vendor of specialized mobile radio (SMR) services called FleetCall: It sold radio-dispatch systems to taxi fleets and other blue-collar customers. Morgan O'Brien, an FCC lawyer during the Nixon and Ford administrations, and Brian McAuley, a cellular-telephone executive, saw an opportunity to turn a patchwork of undervalued SMR licensees into a nationwide network with common technology, billing and marketing. In 1987, they started quietly buying SMR properties. Now, renamed Nextel, the company is a potential competitor to national cellular-phone carriers.

However, the playing field is now far more complex than when O'Brien and McAuley started. Growth in cellular-phone use has leveled off from its frenzied pace: The average monthly cellular phone bill keeps dropping. The US government is running highly visible spectrum auctions for Personal Communications Services (PCS). Barriers to entry will likely continue to fall, especially given the current US and international regulatory mood.

Amid this turmoil, interexchange carriers are defining their local-access strategies; local-exchange carriers are plotting their defenses -- or their incursions into long-distance service. It's no longer clear that smaller, lighter and cheaper wireless phones will grow wildly. Service providers need a more compelling proposition to sell; they need to create new markets. One feature that can open such markets is mixed voice and data communications. Motorola's MIRS technology, which Nextel uses, has this.

For Nextel, 1994 had great highs and lows. It scored a big coup when Motorola sold it some important SMR properties in exchange for Nextel stock, almost completing Nextel's US coverage. Then it looked as if Nextel would become MCI's local wireless access provider. However, talks broke down, part-
ly over control issues between MCI and Motorola. Also, doubts emerged about whether Motorola's MIRS radio technology was up to the task of consumer-grade service at reasonable cost. The wild swings these activities caused in Nextel's stock price probably overstate both the up- and downsides.

In fact, Nextel owns valuable spectrum, and it has recurring revenues from existing dispatch customers. It can now offer a quarter of the US integrated digital paging, cellular and dispatch services, which should see it through to its next phase of serving high-margin markets, such as users of multiple wireless services. Beyond that lies the promise of a mass market.

ERIC BENHAMOU, 3COM: LOCAL <-> GLOBAL ARCHITECTURE

All the major communications infrastructure providers -- including phone companies, satellite systems, private data networks and cable TV system operators -- are jockeying for position to capture as much market share as they can. For most, it's a battle for survival. In the process, they look at themselves and each other and plan tactical investments. A carrier that installs a few thousand of the wrong routers or switches could be permanently crippled. To make things more complicated, the fundamental models of communication systems are in question. The emerging infrastructure may be a closed, highly structured system such as the phone and cable networks, a decentralized ecology of systems such as the Internet, or some hybrid.

Having gnawed on these issues for some time, 3Com ceo Eric Benhamou will discuss the technical architecture that underlies distributed communications networks. From his perspective, the conversation in communication-system architecture has shifted from technology issues such as protocols, standards and speeds, to architectural and philosophical issues such as how networks evolve and create user benefits. Given the high cost of creating systems from scratch, planners need to migrate current systems in a way that lets them scale, given apparent unquenchable demand, while offering economical access even in remote areas. The resulting infrastructures must be fully global, while addressing local policy, social and technical requirements.

Benhamou came to 3Com in 1987 when the company merged with Bridge Communications, which he had co-founded in 1981. In 1990, Benhamou took over as ceo of 3Com, replacing Bob Metcalfe. Benhamou is an active visionary: He chairs the American Electronics Association's National Information Infrastructure Task Force, sponsoring pilot programs to provide successful role models on the NII. He has served on the board of directors of Smart Valley since 1993 and is chair of its telecommuting effort. He has also brought 3Com back from the brink. Last year, 3Com joined the Fortune 500.

PANEL: GLOBAL NET, LOCAL ACCESS

Today's communications environment is Jurassic Park: Dinosaurs of all kinds roam about, some of them quite hungry, some misleadingly slow-looking. Underfoot, more agile (and allegedly smarter) critters try to stay out of harm's way and possibly steal the dinosaurs' eggs.

Carriers large and small face survival issues these days, as well as the riddle of providing local access while achieving global reach. Companies such as AT&T are simultaneously making deals with other countries' telecom...
authorities and plotting strategies to bridge the last segment between their networks and their customers'.

It's a safe bet that the communications infrastructure in 2005 will be dramatically different from today's. It's much harder to predict the changes. Will wireless services offer inexpensive, broadly available access to narrowband services such as telephony and data networking, or will cable or phone companies beat them to it by bundling the service with broadband offerings? Or will it go market by market? The bit-carrying market will commoditize quickly. Winners will have to offer service platforms, not just pipes for bits. Few people can agree on what a "platform" really is anyway.

All of this technological change will occur within a political and economic framework that's equally chaotic; optimists and Brian Arthur (see page 23) would call it "dynamic" or co-evolving.

Russell Daggatt, Teledesic: Up in the air

Teledesic has an ambitious plan to create a global communications system with a network of 840 new low-earth-orbit satellites by the year 2001, at an estimated cost of $9 billion. Its service will initially be targeted to rural and hard-to-reach areas of the globe. The company faces formidable technical and political challenges before it can offer service to customers and subscribers, but two noteworthy people think it's worth the risk: Bill Gates and Craig McCaw have invested personal funds in Teledesic; McCaw is its chairman. Russell Daggatt, its president, is a Harvard Law School graduate with substantial international negotiating expertise. Teledesic was founded in June 1990.

Other satellite ventures are already in motion, such as Motorola's Iridium project (see Release 1.0, 10-92). None is quite as ambitious as Teledesic, which builds on NASA, JPL and Martin-Marietta expertise, including work done for the SDI "Brilliant Pebbles" program for 1000 satellites to serve as orbiting, navigable land mines against space-borne invaders. Teledesic expects to offer more than ubiquitous mobile-phone service at the same cost anywhere on earth. It is designed to provide advanced broadband services -- from high-quality voice channels to broadband videoconferencing, multimedia and more -- that connect easily to local phone systems, wired and wireless.

The satellites' low orbit will reduce the round-trip signal delay (satellites in traditional geosynchronous orbits are 50 times further out). With advanced broadband technology, Teledesic expects to make the sky links indistinguishable from terrestrial fiber links. To save time, cost and some environmental damage, the design allows for multiple satellites aboard each of many different launch vehicles. Teledesic will need to install earth station/gateways wherever it offers service. Its technology so far does not support lone roving wireless phones.

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6 Related issues of Release 1.0 include wireless communications (10-92), the future of the local loop (11-93), the Internet as a communications laboratory (1-94) and platforms for communication (10-94).
There are two ways to look at Teledesic's mission. On the one hand, Teledesic may offer inexpensive, global bandwidth-on-demand that fits seamlessly with terrestrial network systems and makes unreachable corners equal citizens in the communication sphere. On the other hand, governments and telecom entities worldwide could view Teledesic as a form of global bypass -- a delicate issue. Teledesic does not intend to service users directly, but rather will work with local service providers in host countries to enable them to extend the capabilities of their networks. In fact, Teledesic can offer telecom companies a new revenue source and better rural coverage. Daggatt's challenge is to make Teledesic a global cooperative venture.

CAROL BARTZ, AUTODESK: DESIGN FOR A COMPANY

Carol Bartz is what every headhunter hopes to find: A solid manager who turns out to be a terrific CEO when given the opportunity. She started out as a systems analyst at 3M, and then moved on to a variety of sales and management positions at Digital and then Sun Microsystems, where she reported to Scott McNealy. At Autodesk, she arrived at a time when the company was beginning to feel the pangs of market changes. As successful as Microsoft in its own way, Autodesk controlled a much smaller market, a much smaller revenue base -- and needed to figure out how to move beyond it in a way that would capitalize on its strong position in the technical design market. The company's developers were some of the market's best, but widely known for their lack of traditional discipline. Bartz came in with the full support of the board, but great skepticism from the troops -- many of whom didn't realize she has a computer science degree. Now Autodesk is still a great place to work for those who like some order -- and a much better place to deal with if you're a customer or partner.

Under Bartz the company is recasting itself as a collaborative design tool company, addressing the needs of a broad range of users from designers and drafters to project managers, budget analysts and salespeople. In principle, as the world goes electronic and everyone leaves town to live in cyberspace, physical products get more and more intellectual content -- i.e., design. As manufacturing and manufacturing change cycles speed up, there will be more design per unit of product. More and more people will be designing more and more things more and more frantically. And they will need to work together, which will be made easier by Autodesk's groupware tools.

"I'm trying to get people to understand that design is ubiquitous," says Bartz. "You design from the moment you get up in the morning when you decide what to wear, assembling components and handling constraints. You design when you put something on your desk or organize seating for a sales presentation. The more we can create better design tools for people, and the more they can control and create environments for ourselves...we'll have a more interesting world. Design will be in the hands of more people, as opposed to the handful that held us all hostage before."

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7 There may be no net gain in profits; as with so many productivity improvements, the benefit to the manufacturer gets competed away and the consumer gets slightly more variety or convenience; see Release 1.0, 9-91.

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23 February 1995
Is there an artist in everyone struggling to get out? "I don't know that there's an artist," she replies. "It's like editing and writing. I couldn't be a good writer, but I can edit. We can all look at something and say I wish I could change.... You'll always have the artists or originators, and the modifiers or editors."

That, she notes, points to interesting opportunities in the template business. "In the design process, too many people recreate what already exists. Think of the drag on productivity that creates." That may mean copyright issues in some cases, but not necessarily (see Release 1.0, 12-94). For example, she notes, "If they want to copy an Anderson Window into their house, that means they're specing it in."

NATHAN MYHRVOLD, MICROSOFT (AND HIS MOM): WE ALL WANT LOCAL

Most people who run advanced technology groups never get to take their projects to market. Mostly they do research that masquerades as development, or they send their babies out for someone else to bring up. But Nathan Myhrvold is a counterexample who will be going commercial along with one of his most ambitious projects: the Microsoft Network.

He calls himself "a Cambridge physicist gone bad" who once worked with Stephen Hawking and who now moonlights as a chef at Seattle's tony Rover's. But Myhrvold isn't likely to turn into Steve Ballmer; he still takes a cerebral approach to his business.

For example, he wants to give users the opportunity to both buy and create content. "We look at historical examples to get some idea of what the ratios will be," he says. "There are many more letters sent than books read. We all have a mom; a letter from Mom or Dad is important to us but not to anyone else. It's like Gutenberg; the technology changes the economics of information production and distribution. Geography and numbers are abstracted away. Producing for one is the same as for millions. But the user now has to find the one you want in the haystack of possibilities."

Does Microsoft have a natural advantage in this business? Or an unnatural one? "In the pc biz," responds Myhrvold, "most large companies didn't harness their advantages... We're investing a lot of resources in smart people. We're going to take a vision of this we believe in and invest in it until it works."

The big question for the industry, of course, is does Brian Arthur's analysis apply? Will Microsoft inexorably grow more powerful? Or is the Internet actually the opposite of what Arthur's analysis describes? Customers will demand interoperability and so any service will have to provide easy access to any other. You can get paid for providing the best navigation/filtering service, but not for a particular piece of browser software. Individual destinations will be accessible from anywhere; from MS Network you can get to CompuServe's content and forums, and vice versa. Overall membership fees, of course, will be rightly seen as unnecessary surcharges, and people will pay only for reliable access and specific streams of content or online places (and the people who frequent them).
THE FORUM NETWORK (AND OTHER FUN STUFF)

As in past years, the PC Forum has a network of Ethernet-connected Compaq computers -- now multimedia-capable -- in a room (Rimrock) and in the conference center foyer. Attendees can check newswire stories and make comments about topics raised at the Forum (or the Forum itself) in Lotus Notes discussion databases. They can access the Internet at considerably faster speed than last year (see box) -- as long as the Internet Gods are willing. The improved bandwidth allows us to put World Wide Web browsers from Netscape and Spyglass on all workstations in the network, as well as a Telnet program from NetManage for access to remote accounts.

Special thanks to ANS!

Many of the things we do online at this year's PC Forum are greatly improved by a speedy (T1) connection to the Internet that ANS, now a subsidiary of America Online, has generously provided. With this change, the PC Forum's Internet link jumps from last year's 28.8 Kbps (also provided by ANS) to 1.5 Mbps -- access that's 52 times faster.

The Web browsers on the Forum network point by default to a Webbed guide to the Forum that includes the agenda, profiles of the speakers and a map of the Rumpus Room. In the real Rumpus Room, attendees can add their own material to the Web (see page 40). The Forum Web also points to profiles of participating vendors with links to their Web sites for those who have one. It also points to several well-known Web starting points, such as O'Reilly & Associates' Global Network Navigator and Stanford University's Yahoo site.

Lotus Notes' Newsstand

This year there's an important addition to the Forum Notes network: Lotus Newsstand. One of the publications you can find there in electronic form is our own Release 1.0. Newsstand is currently distributed to 25 corporate clients as an early-release trial. It also includes 20 other newsletters, magazines and custom industry-specific compilations.

Test-drive Sony's Magic Link

After registering for the Forum, attendees should have received an offer in the mail from Sony for use of a Magic Link personal intelligent communicator during the conference, with an option to purchase it at the end of the Forum. The Magic Link devices are available in the Kaibab Room to attendees who indicated their interest ahead of time. They contain an electronic version of the Forum agenda.

We are genuinely pleased that Sony, General Magic and AT&T have made these machines available at the PC Forum. (If you don't feel like designing Web pages in the Rumpus Room, you can use the Magic Link to e-mail your home-page's URL to us at spiff@panix.com and we'll weave it in ourselves.)
COMPANY PRESENTATIONS

This year's selection of product and service innovators emphasizes communications. It includes network-based startups such as CyberCash, First Virtual Holdings, Ubique, the Microsoft Network (the network's a startup) and Open Market. There are also telecom-related systems such as Wildfire Communications and Versit, the initiative launched by Apple, AT&T, IBM and Siemens/Rolm. Finally, there's CI Labs, which is in charge of the OpenDoc initiative, and Folio, a company that is making its way from the text-retrieval business to the commerce-facilitation business.

Ubique

Research work that Udi Shapiro and his team did over the past 10 years at the Weizman Institute in Israel is paying off. Shapiro's startup, Ubique, offers technology that helps redefine communications. Two technologies that his team has invented stand out because they weave together the communications and information infrastructures in creative and useful ways: an early system called Active Mail and the Virtual Places architecture (see Release 1.0, 2-94 and 9-94).

Ubique's efforts are significant because they are a great example of the communications convergence underway (see box). In this spirit, Ubique's Active Mail links capabilities across the dimension of time; Virtual Places creates a notion of virtual space. Early experiments with Active Mail used e-mail (a store-and-forward system) to invoke real-time collaborative sessions. When message recipients clicked a button in the Active Mail message to agree to collaborate, they were connected to a shared server that would reflect data streams between the two users. It's conceptually similar to the way digital (ISDN) phone calls work.

From two topologies to many

Until recently, individuals and businesses had two basic communication topologies to choose from: the point-to-point phone system or all the other broadcast systems, such as TV, CD-audio, radio and publishing. The Internet offers these topologies (without as many participants yet, to be sure) and many more, including mailing lists, Usenet newsgroups, Web pages and the forums or conferences found in online services. It also places all participants on potentially even footing (as long as they're willing to invest in the hardware and bandwidth). So far, the Internet appears difficult to monopolize, or even oligopolize, as happened with radio and TV.

One of the Internet's principal assets is the way experimenters weave together the different capabilities it offers. For example, HyperMail (a Lisp application created by Enterprise Integration Technology's Tom Gruber and Kevin Hughes) automatically weaves archived mailing-list messages into Web pages, elegantly bridging two different tools in a useful way. HyperMail lets people browse a list's activities now and then, without having to subscribe and manage the many individual messages.

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Ubique's commercial offering, the Virtual Places product family, combines Active Mail with other technologies, including the World Wide Web. Virtual Places brings the Web to life: It enhances the Web's capabilities with live interaction, text and audio conferencing, and joint navigation. It is an open, client-server architectural extension to the Web that can turn any Web page into a virtual place.

The product family has two components: the Virtual Places Server, which runs as a Unix process next to other servers such as HTTP and FTP, and the Virtual Places Companion, which extends many popular Web browsers with capabilities such as multi-party live chat (text only), peer-to-peer chat and audio conversations. When a user with Virtual Places capability reaches a Web site that other Virtual Places users are logged into, she automatically sees the other participants and can interact with them.

Users can have their pictures show up on the Web pages as they interact, they can trade personalized business cards that include links to their own home pages and they can log their activities for later review. Participants can pile into a virtual tour bus (or any other tour metaphor they care to devise), which gives one user control and brings the others along for the ride. All tour participants then follow the same Web links, while interacting with each other. The tours can be packaged for replay by others later. Ubique will offer templates to help companies create help desks, trade-show booths, chat rooms, lecture halls and virtual cafes.

The Virtual Places architecture coordinates activity between several protocols, which allows it to overlay real-time chat or animation on a more static background, such as a Web page. Ubique announced the capability at last year's Networld + Interop, where the company ran a small demonstration virtual trade show. When Softbank Expos (formerly Ziff-Davis Expos) and Ubique officially launch N+I ONline late this spring, net-connected people around the world who can't attend the physical show will be able to tour many booths at the virtual show. In the virtual vendor booths, remote participants can then interact in real time with people at the show.

Ubique has opened its Virtual Places architecture so that it interoperates with any Web server and most browsers. Ubique is shipping beta versions of its Unix client and server software and will soon complete a PC client under Windows. It is demonstrating virtual interviews through Netscape Navigator at the PC Forum. Shapiro intends to generate revenues by licensing the Virtual Places Server and selling enhancements to the Virtual Places client. A basic version of the client software will be available for free.

**First Virtual Holdings**

Lee Stein, the president of First Virtual Holdings, is an attorney, entrepreneur and financial adviser to celebrities, not a technology guy. Less than a year ago, he joined forces with EDS, First USA Bank and several Internet wizards to create a system that allows people to pay for information over the Internet without having to use encryption (see Release 1.0, 1-95, for a detailed description -- and the names of some of the celebrit-

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8 Nathaniel Borenstein, Marshall Rose and Einar Stefferud.

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ies he advises). First Virtual’s system is particularly appealing to small information businesses that might otherwise not qualify for merchant accounts in traditional payment systems and that might not be able to find viable audiences without the Internet. One could imagine back issues of Release 1.0 available through First Virtual’s system.

The system is now in operation, with servers inside EDS high-security sites. Sensitive information such as credit-card and bank-account numbers never travels over the Internet, nor is it stored on servers accessible to it. Soon, First Virtual expects to announce a way that any bank in the world will be able to participate in its system.

First Virtual’s approach makes use of the fact that inventories and merchandise returns are ill-fitting concepts in a bit-oriented world. Inventories don’t decrease when someone downloads a file from your site, and there’s no use in having buyers return the goods (there’s no way to police their removing stuff from their system, either). Given this warp in the continuum of traditional sales assumptions, First Virtual jumps to a different model that has merchants fulfill orders immediately. First Virtual sends confirmations separately over e-mail, then awaits buyers’ authentication before charging their credit cards. Enrolling as a First Virtual buyer or merchant is simple and doesn’t require special software or hardware. Long term, First Virtual may become one of several different commonly accepted electronic-payment schemes.

CI Labs

The battle for the desktop is over; the battle for the distributed software platform is underway. Although it appears to be centered on the personal computer software market, this battle has implications far beyond, into other infrastructures such as cable TV and the phone system. Competitors must address how developers will create applications and deliver services in the future, the nature of those applications and services (what are components? who will pay for them? how will they be sold?) and the way the disparate pieces of software and multiple services will interact.

One problem that everyone has to solve is how to deliver the evolving, interacting, multiplying world of network services to end-users, whether they are corporate employees looking at internal databases or families using multi-player spaces on the Internet. System vendors, independent software developers, and network service providers must allocate resources to next-generation software projects while mitigating the risk to their companies. They need an extensible, broadly useful platform. OpenDoc, a multi-vendor, multi-platform software component architecture, is a major contender for this role as a universal network services platform. The OpenDoc consortium includes Apple, IBM, Novell/WordPerfect, Lotus and Adobe. The organizing entity for OpenDoc is CI (Component Integration) Labs.

Multiple local architectures threaten to fragment the software market: Microsoft’s OLE 2.0 comes from productivity applications, Taligent offers a set of frameworks and perhaps an object-oriented OS, OpenStep is an object-oriented software environment with Unix roots, Kaleida is a promising multimedia delivery environment and there are more to come. OpenDoc is trying to create an environment where the various separate architectures play well together without the user having to supervise their interactions (for more on OpenDoc and OLE 2.0, see Release 1.0, 5-94).

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Jed Harris, technically still an Apple employee, runs CI Labs. He has the challenging job of attracting third-party developers to OpenDoc, while riding herd on the system's developers to finish the multi-platform system. Apple is in charge of OpenDoc on Macintosh, IBM on OS/2 and AIX, and Novell/WordPerfect on Windows. In principle, OpenDoc objects created on one of these systems should run on the others, as well as work smoothly with OLE 2.0 objects, Taligent objects and others.

In practice, the OpenDoc consortium has many examples of these features working, but has some ways to go until all the pieces are delivered and application developers have revenue streams from OpenDoc parts. The architecture offers great possibilities, especially relative to the Internet.

Versit

Versit, launched last fall, is a multi-company, communications-oriented initiative that shares some members with OpenDoc. In fact, Versit's founders see OpenDoc as an important enabling technology for their offerings to work across multiple platforms.

One of the things that holds back growth in markets such as groupware, document conferencing and computer-telephone integration (CTI) is the fact that many of the standards and protocols in question are incomplete and unclear. Versit's founding companies -- Apple, AT&T, IBM and Siemens/Rolm -- account for a substantial share of the PBX and PC markets. These companies wish to bring some predictability and stability to an otherwise turbulent market for communicating applications and services. By agreeing on open and freely available specifications for the implementation or enhancement of a variety of standards and protocols, Versit members hope to encourage third-party developers to write for all of their platforms. Versit is a play on "diversity."

Versit's participants have taken a broad look at the world of communications and have chosen initiatives to bless, finish or launch, all spread out over different time frames. Some initiatives that are relatively complete and are easy for Versit to commit to quickly, such as H.320 and the emerging T.120 video- and document-conferencing standards and a computer-telephony integration standard combining ECMA, CSTA and the Telephony Services API from Novell.

In some key areas, such as personal data interchange (see Release 1.0, 9-93), no standards exist, so Versit will start efforts to set them. Other standards, such as for multimedia messaging and radio frequency communication, are less settled, technically or in the marketplace. They warrant careful observation and maybe future involvement or development efforts.

Unlike OpenDoc, which has CI Labs, Versit has no separate organization. Johanna Cummings, director of alliances at Siemens/Rolm, will represent Versit at the PC Forum. The people who created Versit are among the most forward-thinking people in their respective member companies. In fact, they must periodically return to their own companies to prod them forward.

Wildfire Communications

Intelligent agents have been slow to emerge in the information infrastructure. Wildfire Communications has created an elegant software assistant...
that delivers a simple and useful intelligent agent capability to people for whom communicating over the phone is essential, such as brokers and consultants (see Release 1.0, 11-94). As Wildfire squeezes costs and adds capabilities, its technology could become a broadly used communications interface. One sign of its popularity is a recent agreement Wildfire signed with McCaw Communications, the wireless division of AT&T. McCaw will test the Wildfire system as a service offering.

Wildfire helps people complete and manage calls. Users get their messages and place their calls through their Wildfire personal assistant, even when they're on the road. The system uses a range of speech recognition technology for spoken commands (often short phrases such as "I'll take it"), proper names, numbers and dates. It can autodial people whose names it recognizes, intercept inbound calls while users are on the phone, notify users that a specific caller is waiting and deal with the callers appropriately. It waits patiently for its owner to say "Wildfire," to which it responds, "Here I am." Users can ask "who else is around?" and Wildfire will tell them the names of other users logged into its Virtual Hallway, so they can "meet," even if they're out of the office.

Wildfire's designers have created a great "sound and attitude" through very careful engineering and human-factors design. Wildfire has personality without spurious cuteness. To check it out, call 1-800-WILDFIRE.

Bill Warner is Wildfire's founder and chairman. In 1987 he founded Avid Technology, which develops popular digital video post-production systems and software. Avid is a public company, with 1994 revenues of over $200 million. Warner has won an Emmy and an Academy Award for his efforts at Avid. In 1991, Warner transformed his frustration with the way communications work and started Wildfire with the self-described big goal of creating the most popular software ever made.

The Microsoft Network

As the general manager of Microsoft's online services group, Russ Siegelman is responsible for The Microsoft Network (MSN), the not-yet-running online service that has alarmed the Big Three (AOL, CompuServe and Prodigy) and brought fear and consternation to the brows of potential service providers everywhere. That's the hype, anyway. Assuming Windows 95 lifts off soon, MSN promises to shake up the online world far more than eWorld, the online service from the company that once radically changed users' experience of personal computing.

MSN looks and acts like an extension to Windows 95. In fact, Microsoft developers must walk a delicate line between offering seamless integration -- a tangible user benefit -- and causing problems with competitors and certain US government agencies. For example, MSN makes use of Windows 95's browser and windowing system, as well as WordPad (instead of offering its own dialog boxes and text editor). Other online services could use these components, and Microsoft says it will encourage them to. Of course, then they would take on Microsoft's look and feel. MSN expects also to offer seamless access to the Internet. In principle, a button located in Excel's help system could automatically connect a user to a support bulletin-board or chat line moderated by Microsoft employees or to a transaction service.

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The business model that MSN offers is as important as the software integration. Microsoft hopes to achieve higher overall revenues by offering information and service providers a larger proportion of revenues than is the current practice in the online world (over half, vs. the less than 20 percent of revenues that most online services pay). MSN plans to drive connection charges as close to cost as possible. It will encourage charges for participation, purchases and activities by offering merchants many payment schemes, including subscriptions, transactions and subsidies.

Microsoft has taken a minority interest in UUNET, an important but relatively small Internet access provider with points of presence around the world (the company pioneered commercial access to the net). Together the companies plan to build a global TCP/IP network through which MSN members will get full access to the Internet as well as the content of The Microsoft Network. Long run, MSN's deal with UUNET can be a way for Microsoft to experiment with its version of the information infrastructure. Microsoft has also licensed Spyglass' Enhanced NCSA Mosaic.

Open Market

Shikhar Ghosh, Open Market's president and co-founder, launched the company last year to bring a business perspective to enabling electronic commerce over the Internet and other networks. Since then, he has expanded the company's mission considerably (see Release 1.0, 1-95).

With increasing frequency, Open Market is helping to re-engineer its clients' businesses. This places it in the center of transforming the publishing and financial services online industries, a role that Ghosh relishes and will continue to seek out.

Open Market's technology offerings include server products (which have advanced management and reporting tools, as well as optional security and remote-payment capabilities), the Open Marketplace (which includes StoreBuilder, its thorough, paint-by-numbers Web storefront creation kit) and comprehensive, industry-specific business solutions for electronic commerce. The company will offer merchants many payment models, as well as digital fingerprinting of documents for sale, to cut down unauthorized reproduction of copyrighted materials.

Folio

Folio is no longer the small text-management company that we covered years ago (see Release 1.0, 3-90 and 7-91) and that appeared at PC Forum in 1993. In January 1993, Mead Data (Lexis-Nexis) acquired Folio, giving it access to vastly larger resources, contacts and information sources. Since the subsequent Reed Elsevier (page 9) acquisition of Lexis-Nexis in December 1994, Folio co-founder Curt Allen, now in charge of strategic partnerships, has lost no time in creating plans to take advantage of the company's new position.

Folio's new initiative, the Information Marketplace, is its play to be an enabler in the electronic-commerce infrastructure. The Information Marketplace defines ways for information providers to get paid for their intellectual property over wide-area networks such as the Internet and emerging commercial equivalents.
Part technology and part relationships, the Information Marketplace model includes the Folio Open Infobase Architecture (OIA), which defines APIs that allow people to use various combinations of client and server software. For example, the architecture allows non-Folio client applications to query Folio Infobases and take advantage of the product's features, such as rapid search and retrieval, hypertext linking and data compression.

Folio is forging many significant relationships, including one with the Copyright Clearance Center to create a technical solution to the problem of electronic copyrights.

Folio's original tools have matured into useful, mainstream information-management packages. Its Views Infobase Production Kit (IPK) for Windows is a great way to create standalone Infobases on CD-ROMs or floppies, or multi-user information applications that can be shared across networks. Views is widely used as an electronic publishing platform by commercial publishers, in customer- and tech-support environments and in help systems such as the one that comes with Novell's NetWare.

More recently, Folio announced its Fusion product that integrates Views with Lotus Notes. Fusion allows Notes users to query and link across Notes databases and Infobases. It also lets Notes administrators convert Notes databases into Folio Infobases, which offloads that information from the Notes servers and makes it easy to publish on floppies or CD-ROMs.

CyberCash

During the 1980s, Bill Melton built VeriFone into the key point-of-sale link to credit-card authorization networks. Now, with Interop founder Dan Lynch, he is attempting to do the same thing in cyberspace. Their startup, CyberCash, is out to automate a thin but vital slice of the many steps that make up electronic commerce (see Release 1.0, 1-95). It seeks to offer technology that speeds the secure placement of orders and passes the information directly to the existing banking and credit-card payment infrastructure for authorization. CyberCash's first partner is Wells Fargo Bank.

Potential users of CyberCash must apply for an account and download special software that encrypts and transmits payment information. When buyers press "pay" buttons on Web pages, they must put their account information in a form that pops up. CyberCash is also working on a peer-to-peer electronic cash system that will allow any CyberCash account holders to pass cash to each other without intervention from a server. CyberCash expects this to help launch a market for small electronic transactions, such as payments for publications or database searches.
THE RUMPUS ROOM(S)

Last year's Rumpus Room was fun (some even called it useful), so Jerry's doing it again. This year we continue in the hands-on, peer-to-peer spirit we had last year, with a few twists. First off, we've spilled out of the one room we had last year: There are now three Rumpus Rooms. Another change is that several workstations are set aside for Forum attendees to show each other things they have built or found on the Internet or commercial online services. Feel free to exhibit crass commercial behavior at these workstations, but please relinquish the seats now and then so that others may show off. But the most remarkable change is that this year attendees can join in the collaborative construction of a Forum Web presence.

Help create the Forum Web!

We have dedicated one of the three Rumpus Rooms to Web authoring. It will feature tools (and helpers) from Quarterdeck and Novell/WordPerfect with which (and whom) you can create and publish Web pages using souped-up versions of Microsoft Word or WordPerfect.

You can create pages on a laptop in your room and hand them over on a floppy. Your contribution may be as small as adding a pointer to your company's Web site to the page of attendee sites, or as large as many linked documents with graphics and sounds. Weave a small Web of your own. Point to things around the world. Of course, we reserve the right to play Web-Master and oversee additions to the official Forum Web.

When we began to compile a list of the Web sites that Forum attendees represent or are involved with, we realized that we should offer a place to post them, as well as ways to weave them together into a more interesting product. There may be pages dedicated to industry specialties or topics of interest. Attendees may lobby each other to point to this page or that; some may point to favorite pages that others have created. That's the general spirit we want to encourage.

After a while, this exercise may seem self-referential, holographic and dizzying. After all, the Forum program, its attendees, their associated companies and in some cases their individual perspectives on the Web of information will be reflected in the Web and associated tools. We will feel fortunate if people generate so many pages that we have such problems. This is a one-time experiment. If it turns into a great product, we will consider placing it on display to the world, or even updating it throughout the year, but our intent is to create an environment in which Forum attendees can experiment fearlessly with this technology. We want you to experience it not merely as a publishing mechanism, but also as a social medium.

PAPAGO ROOM: WEB AUTHORING

If Web authoring sounds too difficult to try, don't be dissuaded. Attendees won't need PhDs in HTML to do it. You can start with templates in souped-up versions of your favorite word processors. Or you can use those word processors to cannibalize pages you like. So surf for a while, mark the pages you like and save the source files. (This will all make sense once you sit down and try it out. If you'd like a gentler introduction, get a tour in the Sedona room first.)

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Quarterdeck and WordPerfect will demonstrate their Web authoring tools in this room. The move to enhance word processing tools to deal with publishing on the Web is natural and powerful. One can publish to paper or fax for audiences that often number only one, to e-mail (with carbon copies) for slightly larger audiences, or to the Web, where vastly larger audiences can see it. Microsoft has also taken this tack with its Internet Assistant, a free Word add-on package that offers Web authoring (currently, available for downloading, in beta release).

For the Web, the integration of authoring and browsing tools is a return to its roots: The Ur-Web system that Tim Berners-Lee created at CERN on a NeXT workstation integrated browsing and authoring. The Web has created a whirl of activity that will affect many personal-productivity publishing tools, including those for word processing, page layout, graphics and presentations. In the meantime...

Quarterdeck, a longtime niche player in the DOS utility business, has developed a Web product suite code-named Normandy that should put the company back in the limelight. The first tool to ship in the suite is WebAuthor, an enhancement for Microsoft Word 6.0 that simplifies Web page authoring. Quarterdeck's Emerick Woods and Robert Kutnick will be on hand to help attendees use the software to author Web pages and publish them to the PC Forum Web.

WebAuthor is a set of Microsoft Word add-ons specially designed for Web publishing. Users don’t have to master a new authoring tool. They can piggyback on Word features such as spell checking and thesaurus. They can also have ordinary Word documents open at the same time as Web documents. When users switch between the two documents, the menus and icons switch between WebAuthor and normal Word contexts. Users can import Web documents and save them as Word files, and vice versa. That makes it easy to cannibalize existing Web pages as well as Word and text documents.

List-priced at $150, WebAuthor includes dictionary of 400 Internet terms, URL address book, a forms manager, an HTML 2.0-conformant syntax checker and a tutorial. Over time, Quarterdeck intends to port it to other popular word processors and platforms, including WordPerfect and Macintosh.

The suite also includes a Web browser and a server, planned for release by mid-1995. Quarterdeck has licensed and customized NCSA Mosaic from Spyglass; the enhanced browser’s working name is Quarterdeck Mosaic. Quarterdeck has improved its performance significantly and added drag and drop support, better URL tracking and organizational capabilities, the ability to view multiple Web documents simultaneously and better bookmark/hotlist capabilities. Quarterdeck’s Web Server for Windows will eventually run on other popular platforms, including Windows 95 and NT. The market for NT Web servers should grow swiftly.

WordPerfect’s Web-authoring tools straddle Quarterdeck’s WebAuthor. The simpler tool, available for free online, is a template-driven add-on called WordPerfect Internet Publisher for Windows. The power tool is WordPerfect SGML Edition, which will list for $600. WordPerfect expects to make both available in late spring.

Internet Publisher has templates that guide users linearly through the creation of Web pages. Users never need to see the HTML; they can also
drag graphics into the pages directly. Internet Publisher includes a separate browser, Netscape Navigator with integrated WordPerfect and Envoi viewers. Users who also need Internet access can purchase Internet Publisher Pro on CD-ROM for $50. It includes access software from Novell's LAN WorkPlace product, as well as a trial subscription to any of several service providers.

It has taken SGML a very long time to make it into standard word processors. WordPerfect SGML Edition turns the word processor into a robust SGML authoring tool that can support a wide variety of Document Type Definitions, including HTML. SGML Edition is probably overkill for the casual Web page creator, but it should fit well in corporate document-creation departments that have been looking for a solution that matches the popularity, ease-of-use and cost of Word or WordPerfect with the power of page-layout or SGML authoring tools. The SGML Edition allows for round-trip editing: documents are easily moved between WordPerfect and HTML formats.

PRESCOTT ROOM: COMMUNICATIONS INFRASTRUCTURE

Lotus has responded quickly to the threats and opportunities that the Internet poses for Notes. Its first response, the InterNotes Web Publisher, bridges Notes databases and the World Wide Web by closely coupling HTTP and Notes servers (see Release 1.0, 10-94). Documents stored in Notes databases can be visible to the Web. The InterNotes module converts them to HTML in the background as they are added or updated. In a limited fashion, the process can also work in reverse, with Web pages stored as Notes documents. Lotus is also enhancing the Notes client to browse Internet documents. At PC Forum, users will be able to browse Notes databases from the Web through the InterNotes Web Publisher.

networkMCI Business is a suite of Windows-based communication products that mark MCI's first move beyond standalone e-mail or broadcast-fax services. The suite integrates ConnectSoft's e-mail client software, Delrina's WinFax Pro, Databeam's document conferencing, PictureTel's video- and document conferencing, Netscape's Navigator browser and access to marketplaceMCI, a Web site for electronic commerce. The latter two elements are still under development. The PictureTel option includes hardware that users must install in their PCs. MCI has selected high-quality components and has beaten its competitors to market with such a suite. Over time, MCI will integrate the components more closely.

Checkpoint has a product that should help calm the nerves of people jittery after the recent spate of Internet break-ins. Its FireWall-1 product, which runs on Sun workstations and on PCs running Solaris, offers sophisticated protection to system administrators and senior executives justifiably nervous about giving in to the pressure to put their companies on the Net. It acts as a selectively permeable membrane between private networks and the Internet.

Checkpoint's firewall system is simple to set up and administer. Access rules, which map to re-usable user-group definitions, describe who should have access to what applications when, where and in what direction. FireWall-1 opens and inspects each packet and compares it to the rules without degrading network performance. Administrators can manage many FireWall-1 servers from one location. The system downloads its software filtering technology through the network.

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SEDONA ROOM: ONLINE TOURS AND 3D SPACES

One corner of the third Rumpus Room is lined with eight heavily networked workstations for guided tours. These machines, connected to modems and the Forum's LAN, are outfitted with the suite of Internet tools available across the Forum network. In addition, they sport demo accounts on major commercial online services, including AOL, CompuServe, Prodigy, Pipeline (now part of PSI) and AT&T's ImagiNation Network.

Your Rumpus Room tour guides are Jerry Michalski and Judi Clark. Clark is the owner of ManyMedia, an Internet-based Web, graphics and presentation production studio. She often helps companies understand the Internet and implement its technologies. The guides answer questions and suggest places to look. They also have access to a few specialized Internet client applications, such as Mathsoft's MathBrowser, Ubique's Virtual Places client, WAIS's search engine and -- if we can get it to work in Phoenix -- VocalTec's Internet Phone.

Three of the eight guided-tour workstations are set aside for Forum attendees to show off their sites, tools and Web prowess. Feel free to show others your organization's presence on the Web or its very cool tools (and please be mindful of the time so that others can do the same). Has your family put up a home page? Are you the next John Gage? Did one of your software engineers put something outrageously funny on the Web? Show them off here!

Next to the guided-tour workstations, America Online and Prodigy show some prototype software. AOL has some new Internet services and Prodigy has its Web-oriented, next-generation interface, code-named P2.

Virtual places galore

The rest of the third Rumpus Room is devoted to virtual spaces. Here you can check out snazzy, 3D-environment design tools from Paragraph; realistically rendered, dynamically assembled spaces from the Community Company; an engrossing new 2D multi-user online service called WorldsAway from Fujitsu Cultural Technologies (debuting at the PC Forum); and an interactive, multi-user 3D environment from Knowledge Adventure Worlds. Compare your reactions to the various approaches. Imagine them linked to each other, or to online documents or movies.

ParaGraph is best known in the US for its handwriting-recognition software. Founder and president Stepan Pachikov got drawn into cyberspace by his son, Alex. Of course, their new mutual interest led to a new software product, Alter Ego, which helps even amateur designers develop 3D spaces -- then navigate through them. This software is the first step in a larger project to make a software time machine that will allow Pachikov and his son to travel through history.

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9 The Internet tools include Telnet and Gopher software from NetManage, plus Web browsers from Spyglass (Enhanced NCSA Mosaic) and Netscape (Netscape Navigator).
With Alter Ego’s software tools, it’s easy to create a room with windows, tables and doors. Developers can add textures or images to any object and set them in motion -- the textures, that is. That’s how one might create the effect of clouds passing overhead, or a river flowing past one’s point of view. One can then steer through the newly constructed virtual space in real-time. Pachikov can also demonstrate movable objects as well as complex spaces with interconnected, complicated rooms.

The Community Company is a recent startup with the goal of fostering virtual communities of three kinds: geographic, demographic and economic. Its founder, Mark Pesce, has been deeply involved in the standards-setting process for a scene-description language for shared 3D virtual spaces. He and others have recently defined the Virtual Reality Modeling Language (VRML; see Release 1.0, 7/8-94). VRML, which uses portions of Silicon Graphics’ Open Inventor protocol, is now well positioned to be the base 3D scene-description language for the Internet.

At the PC Forum, the Community Company is introducing freeware VRML browsers that run on Windows, Macintosh (PowerPC and 68K) and SunOS/Motif. (The browsers will be downloadable from http://vrml.wired.com.) In the next couple of months, several large vendors will announce commercial browsers that use the VRML code libraries. As Pesce demonstrates, VRML and HTML documents can interact. You can click on the image of a poster in a 3D room and travel straight to that Web document. Conversely, a Web page could invoke a VRML space.

On the content front, Pesce is involved in projects of the types he wants. A collaborative "community browser" project should lead to a 3D walkthrough of the South of Market section of San Francisco called "Virtual SoMa". Wired Magazine is converting a section of its Web presence, HotWired, to VRML. Other organizations are interested, too, including the Internet Underground Music Archive and several of the online service providers.

Fujitsu Cultural Technologies debuts its online service, called WorldsAway, at this year’s PC Forum. WorldsAway builds on the Habitat system that ran on Commodore 64 micros through America Online’s predecessor service, Quantum Communication Services (see Release 1.0, 7-93). Although Habitat ran for only a short while in the US, it has been in use in Japan for a long time on the NiftyServe service.

The new service adopts the best social and graphical concepts of Habitat, but greatly improves the technology. WorldsAway offers a rich, animated 2D environment where people, worldwide, can meet, interact and join together to build virtual communities. Participants can create and control their online identities -- called avatars -- and portray their real personalities or create totally unique personas.

Avatars can walk, wave, jump, sit, create facial expressions and take part in a variety of activities including social functions, scavenger hunts, and

10 The browsers incorporate an OpenInventor-compliant parser for VRML built with the Quick VRML Library (QvLib). SGI recently released the parser’s source code into the public domain so that others may write browsers easily. SGI benefits as more people adopt OpenInventor.

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even run their own virtual businesses. Avatars communicate with each other by typing and through actions by gesturing and creating facial expressions. What the users type shows up overhead in color-coded word balloons. Participants can earn or buy tokens and use them to get new paraphernalia for their avatars, decorate their apartment or to access special features, such as a transporter.

The service will be generally available by this fall. Access to WorldsAway is through CompuServe. Participants will log into CompuServe through the CompuServe Information Manager (CIM), then through CIM launch the WorldsAway application.

Knowledge Adventure Worlds considers itself to be a publisher and packager of 3D, multi-user virtual environments. It has split into commercial and consumer groups since we first wrote about it in *Release 1.0*, 6-94. Its basic offering is similar to WorldsAway in that multiple avatars can interact in a virtual environment and exchange typed messages. There are several differences: KA Worlds' spaces and avatars are three-dimensional; the spaces can exist as multiple, distributed instances (as opposed to a centralized subscription service); and they work over the Internet. In fact, starting this spring, the client software for some KA Worlds products will be downloadable from the Web (http://www.kaworlds.com). Users will then be able to launch the software and participate right away. Other titles will run from CD-ROM, with a connection through the Internet or online services, and will be distributed through traditional channels.

KA Worlds is designing virtual commercial spaces under contract as business applications. The company's San Francisco office expects to unveil an online World Trade Center by the end of the year. It has an Interactive World's Fair and other trade shows in the works as well. KA Worlds' first round of financing included an investment from UB Networks, a subsidiary of Tandem Computers.

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