

When I was asked to come speak, they put it like this: come talk about the technologies connected executives will be using in 15 years.

Well, 15 years is a long time. Last year, Lewis Platt, the CEO of Hewlett-Packard and a reasonably shrewd dude, observed that long-term predictions are absolutely worthless. (For instance, he probably wouldn't have predicted he'd be out of a job by now!)

There's one thing you know. If you simply extrapolate on what's happening right now — or even what's in the labs — you're going to miss something really big. Think of all the smart people who completely missed the Internet.

This being the case, I congratulate you on your cost-effectiveness. You invited me to speak for free, instead of paying an arm and a leg to someone like Nicholas Negroponte.

And I'll do my best to give you more than your money's worth.

Rather than talking about speeds and feeds and all that stuff, I want to try to think about these issues at a higher level. You can't talk about the future without having more questions than answers. But I did come prepared with my very own personal megatrend, and here it is.

### **The first information age is over.**

That's going to have profound implications for everyone who works day-to-day with information technology — especially executives. Of course it'll change your life just as much if you design this stuff, or if you have to figure out how to sell it.

What do I mean when I say the first information age is over?

Obviously computers aren't going anywhere. Well, except notebooks and PalmPilots and all those other mobile contraptions — those go all over the place.

Obviously there will be more wireless communications, a lot more.

Obviously both computers and communications are going to keep getting faster. A lot faster. While Moore's Law clearly has its limits, I'm willing to posit that things will keep moving forward at a real good clip over the next 15 years. Maybe it'll take a breakthrough in optical computing or something else.

I have to admit, it's hard to imagine they're ever going to get the local loop squared away, but 15 years is a long time, so I'll even take that on faith. Someone, somewhere, somehow is going to get it done. You'll never have enough bandwidth, just like you can never be too rich or too thin. But you'll have a lot.

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What does that mean?

Well, it means more information, processed and delivered to you faster than ever before.

As our friends at MCI liked to say, is this a great time, or what?

What, you're not completely bowled over by this? I didn't think so. See, things are changing. Big time.

Until recently, it's been enough for things to get faster.

Intel just introduced a 600 Mhz Pentium III. Do you know anyone who cares? If it weren't for the government, do you know anyone who would care about Windows 98?

We're at a very unusual moment. Computers are plenty fast enough to do everything most people imagine they need. But they're not nearly fast enough to do the awesome things they could be doing. It's going to be a few bumpy years before we get across that chasm and things change.

How many times in the last 15 years did you sit in awe that you were able to do something you'd never done before? Word processing. Wow, you can cut and paste paragraphs. MacPaint. Wow, drawing pictures on a computer. Transmit a file to someone at the awesome speed of 300, or 1200, or if I'm very lucky, 56,000 bits per second? Build a spreadsheet that models the future of your business? Click on a hyper-link and go halfway around the world?

But it's getting to be a while since you were really amazed like that, wouldn't you say?

We're getting kind of jaded, and what's around the corner doesn't seem quite so inspiring, does it?

Remember those AT&T commercials from a year or two ago? "When was the last time you sent a fax to your little girl from 3,000 miles away, because technology was keeping you so busy you couldn't actually be there with her? You will, friends, you will..."

Is that a threat, or a promise?

Remember what Bill Gates used to say? Information at your fingertips.

We've got it, God help us. You can find out just about anything, right now.

Time was, when you wanted to say something was really significant, you'd call it information — to distinguish it from raw data. Now, it's obvious that most information is equally useless. On average, white collar workers get 190 messages a day. They all have information in them, sort of. What are they all worth?

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For the last 15 years, we've lived in a society that is as techno-philic, technology loving, as any society in history.

People said PCs would transform humanity. That's how I got involved in this stuff — I read all this stuff about how empowered we were going to feel...

People said even more remarkable things about the Web. The next stage of human evolution. The dawning of a global intelligence — kind of like the Borg, I guess. Don't get me wrong, I think it's pretty amazing, too, and as a writer, there's no way I could live without it for any length of time.

But attitudes are changing. They always do. Bill Gates had a lot more friends 18 months ago than he does now. We're still people. We're not virtual. We're real. With real problems.

There is a building discontent with the way technology serves human beings, and it's going to grow very loud over the next coming years. When culture changes, everything changes — and when it comes to the culture of technology, the ground is shaking beneath our feet.

And it's easy to forget: executives are embedded in culture no less than anyone else — even if the culture they're embedded in is global.

OK. You didn't come to hear a diatribe. Now I'm going to get positive — I promise. Here's my other megatrend.

### **There's a second information age dawning.**

And it's going to be a lot better than the one we're leaving behind.

We're about to begin a transition to a more mature, useful relationship with information technology. Both on the vendor side and on the consumer side.

Our systems are going to be a lot smarter. They're going to be a lot more human. There's a lot of money going into this, and as consumers, we're going to demand it.

At the same time, I think we'll be more realistic about what technology can and cannot do. In just the way that the first generation of Internet users developed "netiquette," the next generation is going to learn when not to send an E-mail message at all. What can be safely ignored. What can be delegated to smart electronics, and what can't.

People are going to start setting boundaries. Because if we don't, faster, smarter technology will accomplish only one thing: it'll put us all on an even faster treadmill.

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As I've said, I believe people will have a lot more say about what kinds of technology they get, and vendors are going to be smarter about building technology that people actually like. Assuming that's the case — and assuming many of the technical constraints are going away — then let's ask: what are people going to want?

And in particular, what are executives going to want, since — face it — they have the most money and power to get what they want?

Here's my list. I'll be interested in yours.

### **Item #1 on my list. Freedom.**

I'm not talking about the freedom to work 24 hours a day, connected via satellite data link and global positioning system from a deserted beach in Tahiti. I mean freedom from technology.

In *Data Smog* — a book I recommend highly — David Shenk observes that the truly hip thing to do is to get totally disconnected. The longer you can get away with that, the more elite you really are. It's shaping up as the 21st-century executive version of "I don't type."

Anyone who comes up with technology that can help you escape technology is going to get very wealthy.

What kind of technology might that be? Maybe the third or fourth generation of agent-based systems that go out onto your corporate intranet and find what you're looking for? Maybe smarter filters that know which E-mail messages to trash?

We can see the very beginnings of these things now, but they're not nearly at the point where anyone sane would trust them to do anything important.

Well, in information technology, things get smarter a lot slower than they get faster, but they do get smarter. Or at least they start to look smarter. Which in a surprising number of cases is all that matters. And as Garry Kasparov found out in his chess match with Big Blue, when you're really, really fast, it's a lot easier to look smart.

Maybe one of these days we'll get a corporate version of the Turing machine. The famous computer scientist Alan Turing once said that the true test of artificial intelligence would come when people could talk to a computer and not realize it was a computer. You know the corporate version: it makes decisions you can't tell apart from human decisions. Not necessarily better — just indistinguishable!

Of course, then we're all out of work.

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## Item #2 on my list. Understanding.

People hate information. They want meaning. Technologies that can provide this are going to be huge. Now don't misunderstand me. I'm not positing computers with true intelligence or human emotion or any of that. But you'll be amazed how much better computers are going to get at faking it.

Remember a little while back, when that book *Primary Colors* came out, written by Anonymous, and everyone had a field day figuring out who wrote it? And the guy that unmasked Joe Klein, who was it?

It was an English Professor at Vassar named Don Foster. Foster programmed his computer to track the statistical properties of human language. And he found that only one of the suspects fit the profile: Joe Klein.

Statistics are one thing, but higher level stuff is another, right? Maybe.

You know, Shakespeare wasn't just a playwright and a poet, he was an actor, too. And for 400 years, one of the biggest mysteries has been, which of his own roles did Shakespeare play as an actor?

Foster managed to figure that out, too. He already knew when Shakespeare wrote each play, and he knew which play was on stage at the Globe Theater while he was writing the next one. So, he figured, might the words Shakespeare was reciting on stage be subtly influencing the ones he was writing around the same time? They were. This is described in another great book, *Interface Culture*, by Stephen Johnson. He says:

“The results that came back from the lab turned out to be as precise and clearly defined as a fingerprint... And they could be confirmed from a number of different angles. They never assign to Shakespeare a role we know another actor took. The roles are all plausible — male characters rather than women or children. On those occasions where Foster's test indicates that Shakespeare played two roles in a given play, the characters are never onstage together.”

The point I'm making is that, even without understanding a word, computers can process documents in ways that help people understand things they never could have before.

I don't know how many of you use Microsoft Word 97 or Word 2000, but I've written a few books about Word, and it has a really awful feature called AutoSummarize. Word “reads” your document, and picks out what it thinks are the most important sentences. So you can create an executive summary by simply choosing AutoSummarize from the Tools menu.

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In highly structured documents, it almost does a halfway decent job. In unstructured stuff like E-mail memos, where you'd really like it to work, it's a piece of junk. Sort of like the handwriting recognition in the original Apple Newton that Doonesbury used to make fun of. But it's not going to stay lousy forever.

You build stuff like this into the user interface of a computer, or an integrated voice mail system, and things start to get really interesting.

Stephen Johnson calls this a semantic interface — one that can make judgments about what's in your files, or E-mails, or whatever, that are reliable enough for you to depend on them. Just like a spreadsheet crunches numbers, these semantic interfaces will crunch meaning. And they're coming.

Right now, today, if you can do 20% of the work of providing meaning, the computer can do the other 80%. Let me give you a for instance.

You all know that Web pages are built on a markup language called HTML. Now HTML is actually a dumbed-down version of something called SGML, the Standard Generalized Markup Language. SGML is used by defense contractors who have to build zillion-page documents and need some way of structuring the content so it can be reused. It's so obscure that practically nobody uses it who doesn't have to.

But there's the kernel of a really great idea there.

If you can mark up a document with tags that represent its meaning, computers can process it, repurpose it, restructure it, analyze it and deliver it — all automatically.

Well, they've taken some (but not all) of the most obscure stuff out of SGML, and come up with something new called XML, which supposedly, we mere mortals are going to be able to use. If regular people can start building XML documents, what does that mean?

Well, it could mean big things for electronic commerce, because you can standardize on a tag that means "Price" and send your browser out to find the cheapest widget on any of ten zillion Web sites. That's getting a lot of hype, but I'm not sure what's in it for the Web merchant to commoditize their products quite so efficiently. It's sort of the kind of application a technologist would come up with — *wouldn't it be neat if we could do this?*

I think the real excitement comes when organizations start tagging business documents with substantive meaning executives can use to make real decisions. What those tags will be is anyone's guess. Unlike HTML, you can create whatever tags you can imagine — even if you're not Microsoft or Netscape. Seems to me that an XML-tagged intranet and messaging system is going to be a very powerful weapon.

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One last example that falls into the category of understanding. A few years back, maybe you heard of Executive Information Systems. To oversimplify, as an executive, you were supposed to get a dashboard, a control panel you could look at to see exactly what was happening in your business. But by and large, company IT infrastructures weren't up to the back-end stuff needed to make that work.

Now there's data warehousing. Basically, you make a copy of all your enterprise data, and design a front-end query system people can use to discover all sorts of patterns they never imagined existed. Kind of like Don Foster and Shakespeare. Do the people who buy Fritos correlate with the people who pay with personal checks, or with the people who pay with credit cards?

Data warehouses are getting smarter and smarter. They're being combined with neural networks and fuzzy logic and other artificial intelligence stuff that is out of fashion, but quietly getting better in spite of that. Even more important, people are building front-ends that allow virtually any manager to access this kind of information from within a program they already know, such as Excel. I think it won't be long before every manager in an enterprise of significant size — in marketing, operations, finance, wherever — will be tied into a data warehouse system, constantly.

### **Item #3 on my list. Simplicity.**

We aren't going to be able to purge microprocessors from our lives, nor do we want to, most of us. But the Macintosh and Windows interface has just about reached its limits. I'm sorry, guys, prettier trash cans aren't going to make it.

Voice interfaces are coming. Now, I'm not one of those people who thinks voice is the perfect interface for everyone, for all things. What are you going to do, close up all those open offices so people don't have to listen to each other talk to themselves?

But over time, you'll see a lot more voice recognition and text-to-speech. Here's an application I love. Olympus has introduced a tape transcription unit with IBM voice recognition. You don't just get a digital audio recording, you get a transcript. Now that's cool. It's not sufficiently reliable yet — and you still need the computer to run the voice recognition software. But in a few years? That's going to change.

So imagine you've got your hand-held digital transcriber. You record your memo. The system transcribes it. Spellchecks it. Parses it for meaning. Presents you a one-sentence summary for double-checking. (Or maybe if we're really lucky, it'll have the nerve to tell you there's no meaning in there to parse!)

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...Sends it via wireless to your intranet server, which forwards just the summary to the people who honestly need to see it. They get the summary along with all the other summaries on a one-or-two-screen electronic file, automatically prioritized to correspond with the keywords they've been typing (or speaking) of late. In other words, the system knows what you're working on, so it knows what messages you'll probably want to see first.

So, for once, the important stuff actually does cut through the clutter, automatically.

#### **Item #4 on my list. Support for in-person relationships.**

You know the phrase: face time. It has dawned on people that electronic communications are no substitute for meeting another human being, shaking their hand, building a personal relationship. Being there is something special. And just as police departments have noticed that cops filling out reports in the precinct house isn't the best use of scarce resources, ditto for executives.

In all honesty, I haven't quite got my arms around this one yet. I don't believe most people can travel 365 days a year and survive. I think ultimately most people need real homes, real human relationships, not just virtual avatars and borrowed desks.

If that's true, what does that mean? Does it mean more people stationed "on the ground" in international business cities? Maybe, but not if places like Mexico City and Jakarta keep getting scarier.

Does it mean we'll go back to doing more business locally? Maybe, but I doubt it. Does it mean more videoconferencing? I wonder about that, too. So you give me high-speed video conferencing on an IP network, or an ATM network. My colleagues don't look fuzzy any more. They move at 24 frames a second. But when they go out to lunch, I'm still in New Jersey.

Still, any technology that gives executives more face time is going to be very important. What could it be, if not videoconferencing? Mach 10 space planes? That's kind of beyond the scope of this talk. Maybe it'll be some mutation of those knowledge tools I was talking about, which might be used to brief salespeople so they sound smarter in front of customers — and actually get those meetings.

Do you have any ideas? Here's your chance to get rich.

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## Finally, Item #5 on my list. Privacy.

And this is an issue with the whole society, of course, not just executives.

Products that help executives, or anyone, protect their privacy are going to do very well. Expect, one of these days, to see some laws, too. You know Congress restricted unsolicited faxes a while back; I think E-mail is next. You might also get some restrictions on database marketing, which is already limited in Europe.

As individuals and as companies, one natural response to privacy is encryption. But remember I told you this: one day soon, something horrible is going to happen as a result of high-strength encryption. Maybe something like the Oklahoma City bombing.

Most of the cyberculture people I know say that the government has got to stay out of encryption, and anyhow, the cat's out of the bag, the bad guys have it, and how dare you get in the way of us exporting our products to anyone we feel like?

Ultimately, I don't think that argument is going to carry the day. AT&T is not going to use encryption without a government back door if it's against U.S. law or global treaties to do so. Just as most large companies try very hard not to pirate software even though they could obviously get away with it.

Either that, or the National Security Agency will just buy all those overstocked Intel Pentium III processors and build themselves a super-computer that really can break the codes. (They'll probably use Linux to do it.) Something's going to give, and once it does, encryption, digital signatures, all that stuff, is going to get huge, too.

So there you have it. The first information age is dead. The second is struggling to be born. An age of smarter technology. And much smarter customers. An age where people will demand freedom. Understanding. Simplicity. Face time. And privacy.

The people who give them these things will do very, very well. But the people who get them will do even better.

**Products that help executives, or anyone, protect their privacy are going to do very well.**

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*Special Edition Using Word 2000* (Que, April 1999)

*Upgrading & Fixing Networks for Dummies* (IDG, 2nd Edition, June 1999; 1st Edition, May 1998)

*Microsoft Office Deployment and Administration* (Que, October 1999)

*Microsoft Office Administrator's Desk Reference* (Que, October 1998)

*Global Special Edition Using Word 97 Best Seller Edition* (Que, October 1997)

*Cheapskate's Guide to Bargain Computing* (Prentice Hall PTR, September 1997)

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