

**William H. Gates:
Cruising the Info Highway**

William H. Gates was chairman and chief executive officer of Microsoft Corp. when he addressed The Economic Club of Chicago on April 18, 1995 on the past and future of the "Information Highway."



“What I want to share with you tonight is something that really makes me say that my job is the most interesting one in the world, and that is that the world will be transformed with a whole new way of looking at information, a whole new way of communicating. We call this the ‘information age,’ and I think that’s a very apt description of what’s going on...

“Now what we’re talking about is changing the way, not only that we do business, the way that we organize businesses, the way we work with customers, but also the way we learn, and even the way that we entertain ourselves. And all of this will unfold in a relatively short period of time. Certainly within the next 20 years the impact here in the United States will be very, very dramatic...

“The first 20 years were really about creating a tool that would allow us to build documents, and it was a tool of the individual. That’s very different than the computer that came before, which was a tool of organizations. But the primary way that you got a benefit out of the tool was that you would type in your word-processing document or your spreadsheet or your database and you’d print something out; take it to a meeting. And so it was only you, working alone, that was sitting at that device.

“What I’ll talk about that comes in the next 20 years is that, rather than being a device for an individual, or even a computation device, these will turn into communication devices. And devices that are so far beyond, in terms of their presentation capability

and their location capability, something like the phone is, to redefine how we reach out into the world at large...

“Now, the progression over these last 20 years has been very interesting, because it’s quantitative. You can talk about the machine being a million times faster, you can talk about the graphics being a hundred times better. You can talk about all sorts of measures of the device, but the change is really qualitative in nature. The kinds of things we do with the computers are changing...

“I hate the term ‘information superhighway,’ but unfortunately I don’t have a better term. It calls up an image of distance, and what this revolution is all about, it’s about eliminating distance. You will be able to share information and work with someone who’s all the way around the globe, almost as well as somebody who’s right next door...

“Perhaps most dangerously, the concept of a highway implies a very deep involvement by the government, perhaps even funding the creation of the infrastructure. And fortunately, I think, at least here in the U.S., people see that the kind of risk-taking and innovation that’s really gonna bring this to life is best done by private companies...

“I’m sure a lot of you are also hearing about this idea of ‘dialing up’ with a computer to an on-line service or a thing called the Internet. And although those connections are fairly slow, and you can only see text-like information, that is the wave of the future.

“To dial in, for example, and see all the checks that you wrote, and to see the bills. Instead of having the bill come through on paper, and you open it up and look at it and you write a paper check, you just get a little message on your screen that your gas bill is such and such, and if you think it makes sense, the computer will compare it to the previous ones and to your budget. If you like it, you just click and it’s paid, it’s done. It won’t be paid too early, it won’t be paid too late. Or, if you have some concern, you click that you want to send a little

message in, type in the message and you'll get a response about whatever your question is.

“And so far more efficient for everyone involved than the kind of paper systems that we have today. And that's just one simple example - actually, a fairly dramatic example, one where we've decided to spend \$1.6 billion to merge with a company called Intuit, a great company that's focused on that area, in order to really further us playing a role in building software to put forward that kind of application...”

“So dialing in, whether it's to buy something or to exchange mail, that is the beginning of this era of communications, where all these machines let you do your work out of your home or let you do it far away. They allow a company to go out and find a consultant very easily across the network, and then collaborate with them by using the machine...”

“This year will be a very important year with on-line services and Internet. Businesses are thinking. How can they put out product information there? How can they relate to customers in a different way? And this is a revolution, because in the past the computers were always something that were inside the company, the way you ran the company internally. You might use electronic mail, you might use a database. Now we're talking about the boundary between the company and the customer, or the company and its suppliers, being very electronic...”

“We need to simplify the computer even further...”

“It's amazing when you make a computer a little bit friendly how people relate to it almost as though it has a personality. A very simple test that we did is we had people go and use a computer, and then we had the computer ask them some questions about how easy it was to work with. Then we took exactly the same thing, had people do it on the computer, and then had them switch to another computer, but ask the same questions, and so it was a different computer asking. And people were far less kind rating their experience when they got to

switch computers, because there was this notion that they were criticizing the computer they'd been on.

“So it's a very natural thing for us to anthropomorphize various devices and want to think of each as having a personality. Well, with the right software, we can let you pick what kind of characteristics you want and get the machine to remember what you're good at, remember where you've been before, and really help you out...”

“Now, the speed of these networks will be improving so fast that it's almost like the way the computers will speed up. The easiest way to think of it is that communications will almost be free. It's closer to think of it that way than any other way. It involves the use of optic fiber and some very advanced technologies, and this is where we're trying to get these phone companies and cable companies to go ahead and make that, this investment...”

“You won't even think about the network. I mean, that's another reason I hate the word 'information superhighway.' You know, the miracle of electricity, you don't understand how it...gets to your house, or water. And information will be the same thing. Actually, underneath it, experts will understand, Hey, it's kinda complicated, how it gets there, but you'll just think of information as pervasive. Everywhere you go, the information is there...”

“So, information of all types: your messages, news, all very straightforward. Take something like checking into an airline. Instead of having a ticket where you go to a counter, you'll just have your preferences for where you like to sit in your device, and as you walk on, basically, you'll get a little message, ‘come on here, it's time to go, get on’. As you walk on you'll get a message saying where you should sit. Or when you want to check out of a hotel, as you're walking out it'll show you what your bill is, and unless you want to talk to somebody about it, you just accept it and you're on your way...”

“Now, when we think about schools, one thing that's fascinating is that the ability of teachers to share their best ideas, their best ways of presenting knowledge, with each other. Today it's quite limited. And here, where you have the digital media, it will become very straightforward...

“Well, another area, and the first area all this will come to pass, is in business. Since this group talks about economics, I have to say that one great way to think of this electronic world is to think of it as hyper-capitalism. That is, taking the idea of a market and what it can do in terms of matching buyers and sellers and reducing the friction in that matching process to be almost zero. So that if you want an expert consultant who has certain references, who costs a certain amount, you can find that resource wherever you're interested in it.

“If you want to buy a product and you want to see what everyone else who bought that product, or some professional review organization, has to say, that information will be out there. If somebody's a columnist who's really famous and they decided, heck, they don't need a, they don't have to be inside a newspaper, they can go out here and just publish on their own. And if enough people choose to visit their material, the royalties that accrue to them will be very, very substantial. And so we take and make things much more efficient than they ever have been before.

“Now this, as I've said, will take time. This year, we're doing a lot to understand electronic information. Next year, we'll have a lot of trials where these high-bandwidth connections are being built. And even typical PCs will be connected up with this ISDN. And I believe that, by the turn of the century, a substantial number of homes in the U.S. - over 20 million - will be connected up to this.

“And I have to admit, in the past I've often been overly optimistic about how quickly these things would roll out, but there's no doubt in my mind that this is the direction that things are going in, and I really believe that time frame is quite feasible. In fact, many of the people in industry think it'll

happen even faster.

“There's certainly some concern about what this all means. There are people who worry that some people will have it in the early days and others won't. There are people who worry about privacy. There are people who just worry about the kind of change it will bring. What does it mean for the job that they do, or the things that they've learned?

“And all of those are very legitimate concerns, but we certainly don't have the choice of stopping these advances. In fact, the U.S. is likely to be very much at the forefront of these. All of the technologies - chips, software, communications, entertainment - the things that will really drive this forward, the kind of risk-taking that we see here in technology companies - should allow the U.S. to do extremely well, not only at using this here, but also providing it as a product around the world.

“I really see it as something that provides immense opportunity, and really gets back to the original vision of Microsoft 20 years ago, this idea of a computer on every desk, in every home. So I hope you get a sense of how excited I am by this.”

**Alan Greenspan:
Ideas and Economic Value**

Federal Reserve Board Chairman Alan Greenspan addressed The Economic Club of Chicago on October 19, 1995, on the subject of economic measurement and change in the nature of economic value.



“Ancient soothsayers may have been able to penetrate the future, but unfortunately, they chose to vouchsafe precious few tricks of their trade to today's central bankers. The most effective means we have for looking over