

Bill Gates' Keynote Address

Transcript of Bill Gates' Keynote Address at the Professional Developers Conference.

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Editor's Note: In a few cases, we have added in words that were apparently dropped in the transcription process. They are set off by brackets: [].

BILL GATES: Well, good morning. It's super to be here and see the incredible enthusiasm that's built up around the Internet and using that together with Windows. Today we have not only the group here in San Francisco, but an even larger group that's watching in theaters—over 50 theaters around the country—and I want to welcome them to the Professional Developers Conference.

These conferences have really been major milestones in the history of the software business, going all the way back to the original battle of character mode interface versus graphical interface. We used the conference to bring people in to the graphical world. That ended up completely [successful]—of software companies creating many, many new opportunities. The next big milestone was Windows NT™. That's been really gratifying because the investments that we and you have made over many years are really paying off now with the incredible volume of NT, not only on the desktop but also on the server as well. The last PDC was Windows 95 and that's been the fastest selling software product of all time, with well over 20 million users now. The broad acceptance has been pretty amazing. It's hard to buy a new machine now without Windows® 95. And our upgrade rates have been more than double of any previous product that we've had.

But, today's topic I think is even more exciting than any of those, because today what we're talking about is something that's not just about the software industry, it's about the whole way the world communicates. Communication for business, communication for learning, to socialize, and entertain each other.

The Internet phenomena is truly incredible. What happens when you will get to critical mass and you get the kind of positive feedback that we've seen only a few other times in this business is hard to exaggerate—what the impact of that is. With the PC, it was interesting to see that over 50 types of PCs went on sale when the IBM PC came out, and even as that volume grew, the idea of a standard PC was used as a seedcorn. The IBM PC was in no way perfect. As the volume went up, those imperfections were viewed as opportunities with companies like Compaq and dozens of others. People rushed in to improve the product and the amount of creativity that was brought to bear was enough to create the PC revolution. With the Internet, the breadth of players is far broader and the phenomena is happening even more rapidly. Part of that is that the Internet is in a sense its own distribution system. News about the Internet, new Internet software: it's all there in the blink of an eye. So, we now know what the seedcorn for electronic publishing and electronic communications is. It's all these wonderful protocols, many of which have been around for over 20 years, that we're going to use as the foundation for this new world.

Now, I've talked about the Internet as almost a gold rush. There's really no other way to describe the kind of frenzy that's taking place. That's partly reflected in the rising and falling

stock prices. I think Internet stocks have greater volatility than any category out there. Fundamentally, when you have a gold rush atmosphere, people suspend disbelief. If somebody says, "Hey, I can do something on the Internet," no matter what it is people are fairly open minded; they want to invest, start a new company, do an IPO. These high levels of investment are very, very positive for getting this business going. In fact, as I've gone around the world over the last month I've gone to some unusual places. I was in Poland, Argentina, all over and I wondered when I went to those countries what the level of interest in this phenomena would be —Is it just confined to the United States?—and it's certainly not. If anything, those countries are, in their governments, even more anxious about this because they worry about being left behind. And so although, for the first 15 years of Microsoft's history, I was very proud of the fact that I never met with any politicians, today as I go around the world, I have met with many heads of state who are just fascinated with the idea of what should they do to foster the Internet phenomenon in their country, and then make sure that their human resources are able to reach out to world markets to use this amazing capability.

We actually went to Bermuda, kind of a strange place, but we thought it would be an interesting place to go find someone and see what they thought about the state of the art, about all of these ads that have URLs in them and all the frenzied activity taking place. We found a musician down there and put together a little video with his reaction to the whole Internet phenomenon. So let's take a look at that.

(Video played.)

BILL GATES: So, it's happening and really nothing's going to hold it back. But it is interesting to look at the factors that prevent it from happening overnight. One of those is the whole question about the business model for content companies. Will advertisers be willing to pay lots, will people be willing to sign up on subscriptions? There's a lot of great experimentation going on in this, but I think some people will hold back until they see some great success stories. As I mentioned, we're all having to think about the government now that we're in the communications era, and there are a number of issues here. Just in the United States, you've got the issue of strong encryption and what the government's trying to do to hold us back there. You have the issue of censorship, which is a hot one right now. You even have a number of upcoming issues like the attempt to take the Internet and put it under the same regime that long distance operators are under, which would be a major step backwards.

But, when you think of these problems in the United States, and just imagine that the U.S. is the best case in terms of paying attention to this and having broadly a deregulatory approach to things and because the Web is global, it's going to be a very tricky problem to make sure government interference doesn't slow things down. There are people who think, "Well the answer is simple. There should be no restrictions of any kind to what people do on the Internet." I wish it was that simple, but I imagine, just to take one scenario, if you were a developer whose software product is being downloaded from a server in a country with no copyright laws and you're not getting much income, you would wonder if a wide-open approach is exactly the right way to manage it. When you get to scenarios like that, it's tricky to think who is responsible since you can't get back to the server level, how is there a mechanism to make sure intellectual property or whatever other rules apply that those can be done effectively. So, we're all going to put a lot of time into this, whether it's in Washington D.C. or many other places around the world.

One of the great issues that's coming up is that because the Internet is so fantastic, it should be broadly available. So, kids in schools, people coming into libraries, urban or rural, richer or poorer, getting that acceptability will become a priority for society the same way making books available did, which led to the library system and focus on literacy. That may take some time, particularly as you go around the world. That's another thing I think all of us [need to be aware of] if faster and be involved in this. We do need standards, we don't need too many standards,

that's always a tricky problem. I think the Net has a way of coalescing around a few standards, that will make sure it's not a problem. Once again, everybody has to do their duty whether it's committees or proposals and making sure things are kept open in the right way.

A final problem is bandwidth. Some of the scenarios require a lot more bandwidth than the narrow-band dial-up. The question is how do we move to the next level? With the dial-up modem we will be able to get simultaneous voice and I think that's a huge step forward. In fact, I'm going to show some scenarios that involve the use of voice that I think are very, very mainstream. So, there's one more thing to do there in that narrow-band world. But the big question is how quickly can we get people up to midband, up to a level of performance of 5 to [10] times faster where images are incredibly fast, audio is working and you can start to use video data types. The phone companies and cable companies and ideally, they both do a good job so we can see vigorous price and investment competition for them to get in and provide those connections.

In countries where cable is not as well developed, then for local access, there's really only one provider and so there you simply have to convince the company to make the large investments and to approach it as a high-volume low-price-type phenomena. We're stuck with ISDN a little bit where the volume's not there so they don't bring the price down. Until we can show them the incredible demand and until they understand how they build up that capacity, I think ISDN will be a little slow. The most optimistic for band will be about 10 million people in the United States connected to midband by the year 2000. That's subject to a lot of things going extremely well. Even in the cable case where the focus of the industry is very, very clear and their understanding of the price it takes is very clear, there's a lot of system upgrades that have to be done in order to get out there in the very large numbers. It will be interesting for content developers to think there's a lot of users coming in narrow-band, but yet you have other midband customers or people connected through corporate networks or university networks that have those higher speeds in making content adapt appropriately to the speed is an interesting technology issue.

The Holy Grail, of course is brought in; once upon a time the phone companies told us we had to get that very rapidly, they'd go out there and build that. As they stepped out and looked at the business case, they realized that's not a clear winner. Although in some cases where you have lots of density and affluence in Stockholm, what they've done with optic fiber in Hong Kong or Singapore, there will be urban access to broadband within the next couple of years. What are some of these key standards?

Certainly, today and this entire conference, is focus on the idea of active pages. Making it easy for code and new data types to get in. Electronic commerce is an area that's had a lot of progress. The credit card standards that Visa and MasterCard have had, the amount of business on the Net. Securities, a particular issue for me, because about 90 percent of the electronic mail on the Internet that appears to come from me does not come from me. So, if you get sort of an unsolicited job offer, rude statements coming to you, you might think twice about whether that's really me out there sending that mail. There are some people who send me mail that say thank you for visiting our site; do you like our site; isn't it a wonderful site. Of course I've never heard of your site, I'm not quite sure what to say back, I don't want to disappoint people.

Obviously, multimedia data types—it would be interesting to have people guess, say 5 years from now, what percentage of pages will simply be static 2-D pages versus 3-D pages that navigate around. I think in terms of traffic by far the majority will be 3-D-type pages. That means there's a lot to be done with the hardware, with the run-time software, and with the authorizing tools to make that straightforward. When will the Internet have quality service guarantees, so you know data will get from one point to another? Of course that comes up for real-time data, like audio and video. That also comes up for corporations. For efficiency's sake,

they should get rid of all the least lines around the world where they've built up a private network. Before they do that they have to have some—there won't be traffic jams and security problems that prevent their data from getting through. The amount of business, the amount of income that can come to the Internet as corporations really say well this is it, this is how we'll move our data to all our branches between ourselves and our customers is quite dramatic. Getting the quality standards of service to the backbone and getting software standards for that will be a very, very important element and more involved with many others in trying to make that happen.

Part of the unique thing that Microsoft is doing, and I hope this was illustrated clearly in many of the demonstrations yesterday, is a strong level of integration into Windows. The idea is when you're using local data, using remote data, it should be the same. What we want to do is have everything that comes up on the screen use the browser, the browser will be at the center of the system. What used to be the user, the central part of Windows that does dialogs, that will be our HTML engine. So, extended HTML will be everywhere. Forms packages, dialogs, our help system won't be a separate EXE now. The editor that we have built into Windows will help you compose the HTML form that's the successor. By doing that, the browser is always in the working set. That 3 meg or so that's in the operating system, that will include the HTML rendering. We want to have the unification of interface take place not only for directories and pages that you've already seen, but also for messages, documents, the way you navigate around, find favorites, traverse links; there's no reason as you move to what have been different storage systems, different containers, that you should see any difference there at all. That synthesis is very important for providing ease of use.

Another key point here is that this quality of service thing I talked about actually has to appear in the operating system as well. The idea of a task being able to say, I want to set aside enough bandwidth, enough CPU cycles to be able to deliver this movie or cycle and making sure that that guarantee can be sent back so that nothing comes in and interferes, that's very important. That's fairly deep scheduling technology that will be built into Windows. At the server level, integration is equally important. Part of the idea is the common alt between the client and the server so the code can move around, share the user interface. If an application that's running on a client wants to do printing, why should it just, instead of using client CPU cycles, tell it to run up there and do the print command and free up the local system? If it's the same operating system there's no development involved; it's redistributing the task for what's appropriate in a particular case.

So we take this approach of commonality, Common Object Model, and in particular the distributor COM that we're giving out here at this conference—that's a very powerful story. To administrators who are looking at the complexity of managing user names and all the different events that can come out of these systems, pulling that out together and letting it filter in a rich way, that's an important step for these networks to grow as much as they need to without creating much overhead. If you imagine today a medium-size business that wants to set up a server, they have to think about so many things: what's a relational database, what's a messaging package, what's a Web server, what's an admin[istration] tool. All of those they have to buy separately, learn separately, install separately, and understand what their various roles are and how to work with those. It's way too complicated. We have to have a server that's turnkey, you buy it for your business and messaging customer database management, telephone integration, being able to publish catalogs; all of that including electronic commerce support is simply built in and you don't go out and learn what's inside of all those things. The software industry and Microsoft in particular has a lot of migratory work to do with these pieces in order to make it turnkey for every business in the world to go out and buy a box and put out their products and be in business on the Web. The breadth of opportunities here on the Internet is pretty incredible.

I thought I would do a few demos today to show some of the incredible progress that's being made here. We're going to start out with a product that actually went—it's MACH Warrior. I'm going to ask Kip Olson and Andy Cohen to come out and take a look at this. It's a Windows 95 game. What happened was when this game was written they supported our directed play interface and DirectPlay was part of the game SDK we sent out last October. The first game SDK, DirectPlay 1.0 supported users across the Internet. What can happen when you simply plug in the DirectPlay 2.0 and see what happens with the Internet?

KIP OLSON: This is the game that came out last fall when we were upgrading the DirectPlay interface. I have a great job because I can blow off Andy's arms every day.

ANDY COHEN: It works that way, too. It's a little dark here. We're dialed in over analog lines running over the Internet. Even though this is highly interactive it's not a problem for this game.

KIP OLSON: The great thing about what we did was we weren't just able to make a play over the Internet but we could slip something in the existing game and give it new capabilities. More importantly, we're going to be able to upgrade new futures. We'll be able to have game service to allow you to plug in and have 1,000-player environments. We're building a lobby interface where you can find somebody on the Internet to play with. Like a chat field. 3-D environments [that can] walk to spaces, find people, and talk to them and you might see something like that today.

BILL GATES: It's great to see how people use the games with high performance graphics. There's a lot of focus on the entertainment community and they've really responded well with lots of great games.

KIP OLSON: We look forward to a lot of great games next year.

BILL GATES: Now, let's take that concept of a meeting lobby and consider how could that be used. Say you want to sit down and do a training session. Say you want to sit down and just socialize. Say you want to get together to discuss a product. Today people use chat-type interfaces but they're not very visual; you have to type in all the commands. There's no reason it should have to be that way. One of the companies that's been tackling this challenge of creating great meeting spaces is OnLive!. I'd like to ask Henry Nash to show us some of the progress that they've made in not only creating a visual way of getting together, but bringing audio into the experience in a fantastic way. This is not just for entertainment; it can be used for a lot of great business scenarios as well. Welcome, Henry.

HENRY NASH: What we have here is a 3-D multipoint [audio virtual reality modeling language] (V[R]ML) browser. As we look around the space, it's like any other 3-D space we can move around, but the difference about this space is there are other people there. So, we're obviously embedded as an active document inside the shell, but there are actually people out there connected on the Internet. To your point about socializing, let's see how we can interact with them. Hi there.

DAVE (AVATAR): Hi Bill, hi Henry, this is Dave online.

BILL GATES: You look good, Dave but where's your body?

DAVE (AVATAR): You can decide to leave your body at open when you go online.

HENRY NASH: Well it's really quite easy. Use your arrow keys. Left to go left, right arrow to rotate right, or the up arrow or the down arrow to move forward and backwards. You can go through some high-performance moves or you can spin.

BILL GATES: That's pretty good. Can you show a motion?

HENRY NASH: Oh, sure, one of the best things that we have is the ability to show a wide range of a motion. Let me show you show you what I would look like if I want to show motions. You know, I really like your avatar, Bill. Why don't you take us into your appearance and show the ranges of avatars you can have.

BILL GATES: That's pretty embarrassing; I don't know who made that one.

HENRY NASH: Maybe we can improve this one by hairstyle, maybe.

BILL GATES: Looks like I have lipstick on there.

HENRY NASH: You can also, as well as changing your appearance, you can also morph your voice; you can carry it with you on the Net.

BILL GATES: Now can we hear multiple people and talk to them all at once?

DAVE (AVATAR): People can also send you e-mail by, say, dropping a document on your head. Let's bring of one of those other people in. I think in the space we have Randy online also; Randy are you here with us?

RANDY (AVATAR): Hi, Bill, this is Randy.

BILL GATES: Hi, how are you doing? It's a little windy up there.

HENRY NASH: Show us some multiple talking.

DAVE (AVATAR): Why don't you join me in a session of row, row, row your boat. I'll start out. (Singing.)

HENRY NASH: Don't give up your day jobs, guys.

DAVE (AVATAR): We haven't gotten the singing online yet. How about some musical accompaniment? I think we have somebody else online here. Are you with us, Mike?

BILL GATES: Wow, we have a guitar.

HENRY NASH: Why don't you tell us the way you're connected?

MIKE (AVATAR): Sure, that's great, Dave is backstage and I'm connected locally. Randy, how are you connected?

RANDY (AVATAR): I'm in Cupertino, about an hour's drive, and I'm on a modem connection.

HENRY NASH: How about you, Mike?

MIKE (AVATAR): I'm in San Mateo.

DAVE (AVATAR): One of the best parts about this is the way we've been able to mail technologies from Microsoft like Direct 3-D rendering engine and Sweeper technology that must be a well-integrated Internet application, as well as the technologies from OnLive! that allow us to do the real-time audio over a low band connection. We can run on a machine that's got Windows 95 on a Pentium processor to a 14.4. We frequently have people dial in from Korea or Sweden or Florida.

HENRY NASH: I know you're going to have more people come and join the party in cyberspace; we'll take the volume down and watch you play. We'll talk about what this means for the service side of the Internet and so forth. Basically what you're seeing here is an HTTP server and a [Windows] NT™ box running the voice server. This is the way, using [Windows] NT, we can turn information sites out on the Internet into community sites. The online traveler lets you travel the Internet, visit these communities, and Interact with the people once you meet them and exchange e-mail and so forth. It's turning the Internet into communicating rather than just information.

BILL GATES: So, designing a new space, will there be tools so people can do that as well?

DAVE (AVATAR): This is just a regular VRML space. You can use any VRML out there today. Avoiding the voice-overs and that VRML space can be looked at via regular browser; it's a community of people interacting.

BILL GATES: What kind of markets are you looking at here? I suppose a company can get together and do various sessions here.

HENRY NASH: Especially for 14.4 and 2[8.8] modems. People on the road can dial in, entertainment we see here, going online and meeting people. There are other calls arriving, so there are a whole range of applications. I think it's not just about an individual technology; it's fundamentally changing the way people [share] community on the Internet.

BILL GATES: That's fantastic. Thanks so much for showing it to us. (Applause.) Another big thing everybody is talking about now is the intranet. Certainly, over the next couple of years it's an opportunity for all of us. Companies have made huge investments in PCs and networks to let people run productivity and applications. The investment they made there is 90 percent of what they need to do great information sharing. Some companies are there; they have service names—you know, certain filenames even in a technology company that's a little too hard for people to go out and find. So it's been very interesting as we've started to take Internet technology and use that internally at Microsoft, to take the information that we've always had up on our servers but possibly in a way that's easier to get to our user has gone up by a factor of 5. I'd like to ask Jeff Kelleran and show us one example [of] how we're using these various home pages. We have home pages now for everything, personnel reviews, forecasting; here we'll see an example involving financial data.

JEFF KELLERAN: Thanks. I'm excited to have the opportunity to do this. Not because I'm presenting new technologies you haven't seen—a lot you've seen yesterday, but more because I think it's an interesting display how you can mix different technologies to come up with a meaningful solution. I work in our finance group at Microsoft and one of the big challenges is how you deliver this vast amount of financial content to a really broad number of users. We have several thousand users that access our financial statements, that look at our revenue data, our expense data. How do you deliver that to them in a meaningful, easy-to-navigate way? What I'm going to show you today is a scenario, if you're an executive at Microsoft, of how it might feel. So, here I have an e-mail, and what this [is] is just a high-level summary of what's gone on.

You'll see I have an embedded Excel sheet here. I can get at a high level, any way, a really quick snapshot of what's going on. Now, if that's not enough for me, I have a link to our finance home page. I can get right to the supporting content. Let's go ahead and go to the finance home page and that's going to bring up the browser. Now what's really interesting about this to me, is that this is really the first time we've been able to consolidate and centralize all of this information in one place. This is really in its infant stages right now. When you think about some of the things you've seen earlier this week, it's not a stretch of the imagination to think this will be a starting point for all of our finance content, not just financial statements but what I

call our dynamic contents. Our query tools, even an SAP client, you'll come to one place to get there as a finance person.

I wanted to say something specifically about what revenue looks like in Europe, let's say. I'll go to our finance statements here. It's going to give me a couple of lists of reports. I'll pick our revenue summary reports and I'm going to go ahead and open that. This will just open an Excel document within the browser, the user doesn't know that's what it is, but you'll see that right here in the browser.

BILL GATES: Tells us it's confidential. Don't look too closely.

JEFF KELLERAN: So here you'll notice we use Excel pivoting tables to present the data. I think it's probably one of the most undersold features but it really turns out to be a great mechanism for delivering this kind of data. One, it's tightly integrated with ODBC so you can get data from [an] ODBC data source and you can filter the data by dragging and dropping. You can sort through huge data sets quickly. I wanted to see something specifically about Europe, so I'm going to go drop down there and change it to Europe, and now I have the information I want. I've gone from a high-level financial statement to something more detailed. With some of the advances in the browser, what this allows me to do is I can go back to where I started by using the navigation tools. I click on this; it's going to ask me if I want to save the changes, I don't want to. Now I'm back in the browser. Now, the really important thing about that for me is that as a user, my whole experience is the browser; it's not these different applications popping up and me having to track those and where is which document. My experience is really just navigating and comprehending the different content.

BILL GATES: The one thing I like, if [I see] the sale and I don't like them they have the e-mail [address] of the people I can send an e-mail message. I find it a very powerful tool. Thanks a lot, Jeff. It's great to see that example. (Applause.)

BILL GATES: I think the bottom line is that any company [that has] got PCs and has connected them together really would benefit immensely. They would get a lot more leverage out of that huge investment by buying a little bit of extra software and coming up with the internal standards for how they want to present these pages. Some of the—a lot of the promises about PCs that information would be at your fingertips—is now coming true by blending the productivity technology with the Internet technology. So the intranet is the first stage for companies. There they don't need to worry about bandwidth, they don't need to really do anything but pull in new software.

But the long-term potential is not only to share information inside the companies but to reach outside, and that's this electronic merchandising and electronic commerce. Microsoft is working on a number of initiatives there [with] media server; in fact we announced a large partnership with WalMart as a lead—we asked Pierre De Vries to come out and show us an example of [what] we think shopping [will] look like a year from now. We've assumed here that you've got some kind of midband connection. You have ISDN or cable modem and we're going to show a voice and video and interaction that might fit into a new shopping experience.

PIERRE DE VRIES: Here I am on my desktop, I'm checking my mail and I see I have mail from quite a number of different people. I'm playing the part of somebody who's really into skiing. There's mail saying there's a really great review on this dynamite ski. I'll skip that and go to [Ad]ventureWorks. It's an online equipment manufacturer that I shop with a lot when I go online. You can see that there's the beginning of commercialization here. They know my name. There's the video that gets me into the mood to shop for winter goods. I can look at various parts of the site. I open my mail and get HTML, it's just part of the experience.

What I'm going to do is click on my customer catalog. It knows my profile and they've got permission to track the kinds of things I've been buying, they know what I might be interested in; what they've suggested is I might look at some parkas because they remind me that I bought some thermal underwear in the fall and bought some ski boots and bindings. Here are some parkas. I can do the other side of 3-D. I can have the object there and I can look at it rather than being looked at. That's not what I'm into today, so I'm going to keep browsing. Here we get into skis. You'll see the advance ski is highlighting, giving me a hint of what may be the direction I want to go into. I'm going to click on that VA80 ski and see what they tell me. I get all the various different skis but I heard about this Dynamite VA80. I'm going to click on that and find out more.

Here we are on the page that [Ad]ventureWorks has put together for me on this ski. I can buy it immediately; it's on sale but I want to get a little more information so I can check the reviews, I can check the package prices but I have already bought a lot of things; I'm not going to do that today. I can in fact, personal fantasy, design my own ski graphic and put it on my ski. What I'm going to do today is check the technical info. What I want to know is, is this the right kind of ski for me. And what's helping me do that is giving me the up-to-date information from the manufacturer. AdventureWorks doesn't really as a provider of services want me to go away and never come back, so they're actually doing a search on Dynamite's site putting down the up-to-date information and preparing that and putting it into my frame, so all the navigation tools that I'm used to using are there for me. I can look at the ski and see it's got a fiberglass construction and since we're talking about the future I particularly like number 2 which is the sidewalls. I can do the kinds of things, I can simulate the things I do in the store which is flex the ski and see what it looks like from all sides. At this point, I have all the kinds of information that I can get from AdventureWorks. That's not always going to be enough. You can delve down by—not every piece of information is going to be there—so you want to talk to a real person. What I'm going to show you now is a simulation of the kind of thing you can do with a midband connection with the quality of service. I can click on this service representative and have a video conversation. I think I can see her but she can't see me. She can just listen to me.

AMANDA (SPEAKER): Hi, this is Amanda.

PIERRE DE VRIES: I'm looking at the skis and trying to decide if they're right for me.

AMANDA (SPEAKER): You're looking at the Dynamite skis. Where do you like to ski?

PIERRE DE VRIES: Crystal Mountain.

AMANDA (SPEAKER): Northwest. Let me pull up my map. They seem to be most popular where the snow is wet, not too icy, such as the Cascades. Most of the folks in B.C. seem to enjoy them as well.

PIERRE DE VRIES: I'll go with them.

AMANDA (SPEAKER): Great, enjoy your new skis. Is there anything else I can help you with?

PIERRE DE VRIES: No, so, I have the information I've needed. I've spoken to a real human being to get the assurance I want. Any good merchant knows that I'm buying skis and wants to know if I want bindings. Today I'll decline. Here, I have the shopping part. The experience AdventureWorks has given me will be different. Some things I want to have constant when I'm shopping so things are the same no matter where I go. This is a standard shopping card that I can find anywhere I go. I can see the idea that I'm going to buy. Shipping and tax is calculated automatically. I'm going to press "buy now," enter my password; my Visa is already set up, I can thank that but I won't do that, I'm going to pay right now. The transaction gets set up for

me, AdventureWorks creates a tracking number which is stored on my client, so if I want to go away and search for the item a few days from now to find out where it is, doing that. So I'm done; there's a box saying there's good news about my account and do I want to find out about it. I'm told congratulations, I now have 3500 purchase points and this might entice me to do more shopping.

BILL GATES: It looks like shopping will be more efficient so I'll have more time for programming. Thanks.

Well, a big question here is what is the opportunity for all of us. I put at the top of the list here volume. The economics of the software business are very, very volume-dependent. In fact, if you look at the operating system business, if we only sold 30 or 40 million operating systems a year, we'd lose money, we couldn't afford the R and D money we spend. Because we sell 60 million it's a pretty fantastic business to be in. That's where volume comes in and really has an impact. We believe with the Internet the number of people using software in a very broad sense will go up very dramatically. For a software company it's a chance to stay in contact with customers, let them have information, a chance to support them better.

Just imagine, compare what we have today when people call up on the phone and try and describe what's going on with their computer versus connecting with the Internet, see them on the screen, guide them along; you can get all the context of what they've been doing electronically, if they want to let you do that, you can shorten that technical support and do a far better job. For many software companies that's a big deal. We spend 5 million dollars a year for customer support [and] we don't expect to reduce that, but we do expect to do it more efficiently and therefore do an even better job. Software distribution, a locality of that will move onto the Internet. Certainly, demo software, smaller software, CDs are always a very efficient distribution vehicle. We're a lot better off [than] with just floppy disks only a few years ago.

Certainly there's going to be a huge market for component software, the business there we expect to be about 10 times bigger 3 years from now than it is today. A lot of that is the so-called ActiveX™ Controls. All of these people doing content work, they are not programmers. They don't want to know about programming languages or anything. They want a pallet of things that they choose from and drag and drop those into the pages to create that interactive presentation. They're counting on all of us to build rich libraries to expand all the different scenarios, whether it's looking at a shopping cart or trying to plan a schedule, looking at maps; every data type that exists in the real world we need to create great controls for and make those available to the amazing volume of authors that are going to be out there.

Certainly there's room for lots of new applications and there's room for new versions of existing applications. For us, that means going back and looking at everything like Office and saying, "How can it be better in this environment?" I'd also say that beyond the product business, there will be far more demand for people who understand the Internet and setting up software applications on it than will be available worldwide for at least the next decade. We're sitting at the center point and companies who have that service aspect will be doing extremely well just like the product companies. I want to make it clear how big we're making it in this area. Everything Microsoft's doing is tied in with the Internet. I talked about the client software and the very rapid revolution there. The server software, lots of new additions there on an integrated business. The family of tools is quite broad. Sometimes when people talk about pages, they're talking about something simple, it's just text, and sometimes they're talking about a custom-built application that might have millions of lines of code behind it.

A wide variety of tools, standard tools to C compilers. Any language people want to use, we'll be there to support and any level of sophistication they want in the tool certainly we and third parties will have what's required there. We're also doing things to build Internet sites to bet on this content business. That's very similar to the bet we made with Windows on building

spreadsheets and word processors. Now the content business will always be 100 times more fragmented than say software, [but] we see a good opportunity, getting out there and being a pioneer and using this technology will help us to do better on the other pieces and some cases actually show the way. So, we've got the Microsoft Network, it's now just a community on the Internet; there are two ways to sign up. You can sign up where we include our access, so it's got the phone number and the connectivity; we're at over 850,000 users just in the 7 months that we've been up, so it's actually faster than we've expected. A lot of work went on to build broader availability of the connectivity throughout the world and huge investment going into the content. Focus here is on HTML and exploitation of these Active[X™] Technologies that we've heard about. We'll make this be a showcase.

MSN is a content club, is part of what we're doing, but we have a very large Interactive Media Division that's looking at a number of things. Some of these will be purely advertiser-supported. Some of them will be transaction-supported; we think the opportunity to get out there in some cases by ourselves and in some cases in partnerships is pretty fantastic. Some of the the big partnerships are the Dreamworks studio, building new interactive titles and taking the other work we do with media and bringing it into this world, both CD-ROM and [the] Internet. A partnership with NBC is a big one for us. It involves a 24-hour cable channel like CNN, but with a different twist and connected in with the Internet site. Those two will be referring to each other. All the programming is done for the cable channel and the Internet site is one overall strategy. We'll take our current CD-ROM titles and make them available through the Web. Any of the articles you see there will be links to all the different sites on the Internet where there's information about a topic. So the equivalent of applications here is [different]. We'll be one of many, many companies that are doing our best in showing we believe in this by making huge investments, some of which won't pay off for a long long time. I think it's critical to keep in mind that everything is improving here.

You can't think of the PC itself as static. The PC we knew 5 years ago, I don't think any of us would be very satisfied with. The pace of innovation in this is faster today than in the past. Whether it's the size of storage—it's going to be hard to buy a PC with less than a gigabyte a year from now. Even a \$900 PC. Processors, Intel and its competitors are doing products like Pentium Pro. That's a huge step forward; we're certainly in partnership with Intel building compilers, building extensions for MMX, which is their multimedia instructions, which I think is a great initiative by Intel. I believe that a lot of PCs will have smart-card readers. Part of the security problem will involve smart cards. In the United States we won't hand them out to every person so it will have to be the credit-card companies. In some countries it's becoming a standard thing that everybody in the country will see. The hardware forehead writing has not been popular to date, but I still believe that's a wide area.

I think people coming to a meeting like this one will all be bringing a PC and be able to work on that in taking notes. Video and graphics, the PC, the room for that is pretty incredible here. Not only moving up to 3-D and high resolutions, but moving up to a whole new way—of course advances in screen technology make a big difference in terms of what types of documents you're liable to view electronically as opposed to on paper. I [broke] it into two slides. Improvements. In some cases you might say remedial [improvements] that are crucial. We have to, though, make the system very solid so you don't end up with device drivers that break things. We get over a million calls a week from people; we log all those calls. We understand very well where it is we need to go in the architecture.

The PC is getting better but it's nowhere it needs to be. Plug-and-play was a step in that direction, but the simply interactive PC effort that we're putting a lot into, goes a big step further in that. We think it's got to be easy to [put] up great systems and applications. Many companies have huge installed bases. If you go out and talk to those users and say, "Why aren't you buying the new versions?" it's because of the complexity. As we make it as easy as downloads [for someone to get] a new browser, to get the new application, to get the new operating

system, upgrade rates will be dramatically higher. The always "on" communication where you don't think about boot time, application start-up. That's got to be done because when you want to get information on the Internet you don't want to wait.

One particular point I put down here is the family strategy. Windows NT is positioned as a high-end superset of Windows 95. But in the last revision, we didn't synchronize the shipment schedules. There were some things in Windows 95 that weren't in Windows NT. With prices really starting to come down and Windows NT being bundled on Pentium systems, making this clear-cut real subset/superset relationship over the next several years, whether it's 2, 3, 4 years, Windows NT will become a huge part of that desktop mix. It's very important that we're delivering totally on that family strategy. At the same time we're doing those improvements we're going to be doing a lot of innovative things.

Unified storage. This is the Holy Grail of Cairo. Advanced directory that deals not just with user objects but all types. User profiling we got a little glimpse of. I think this will be very detechnology-based on base key. You track what they're doing. That will allow the agent scenarios where you help the user, guide them, show them new things they might be interested in. That allows them to work. It's a fairly deep set of technologies that should be shared across all applications and therefore we're looking at that as a piece of the future operating system.

Speech recognition, those [are] things that should be built into every application. If you go 10 years out, I would say that a lot of Web navigation, a very high percentage would be voice-driven type navigation so we have to get into the client's system that is very rich and be able to do that with a lot of accuracy. In parallel with this we will have more varieties hooked up. Here it's a little unclear what the critical mass would be. It's important to remember that the PC has a large installed base: 200 million in active use and 60 million sold every year. With that still at 60 million, those numbers are overwhelming. That's where people focus their content. Another one of these design points to get there, it's tough, you have to get authorizing attention. The kind of page you want to put up on TV is a little different than what you want on a high-resolution screen. I think the TV flavor will come into this, not as substitute for the PC, but something else you can browse.

The PDA, or wallet PC, that's where we're making huge investments. We're actually taking a subset of Windows, a portable subset of Windows and building it into those devices. There are people who even say that for high-resolution screen devices, there may be more variety. I agree with that; the diskless PC for people who have high bandwidth connections. It's not going to work with 28.8 or most of these to do Web browsing. The amount of code that you use, not only as you run the browser, but when you go to Shockwave or Acrobat or RealAudio or the other types out there; you're actually using more code when you're browsing the Internet on the large Windows applications today. You can't do it very well in a 4 megabyte system, and even 8 megabytes is difficult in some systems. Web browsing is a very high-end application. All the things we're talking about, making these pages richer with media and controls will simply further that.

When we think about how will PC configurations change: Will diskless PCs finally take off, will people choose to buy PCs at lower price points?—this is all relevant. There have been people promoting \$700 and \$800 machines. You can buy 486 DX4 machines for \$800. The PC market is very competitive. I do believe over time, there will be more divergence in PC converge generals. Drive the price point instead of leaving it steady and driving the machine. When you think about these new configurations though, it's important to think [about] what you're leaving out. Are you leaving out the screen, or the keyboard or the mouse? Are you leaving out the processor?

There's certainly no magic in processors. The cheapest in processors is where the volume is at any level of performance. That's why high-performance things like Pentium and Pentium Pro

are the most competitive. If you want to move down a notch, there's lots of people who have 486s that aren't finding much volume today. So, the different elements that make up a PC, if you were going to build a [P]C just to do browsing, you couldn't leave too much out of it. You probably wouldn't leave out sound, or the network connection. There's a lot that can be done to make the operating system to make these kind of scenarios for the person who's primarily doing browsing simple the way it should be. So we have some work to do. But I would suggest that really the PC can be configured in ways to meet the scenarios. We're focused [on] making sure the software is there to do that right.

Yesterday was a very exciting day for many, many, many announcements. To me the most important announcement yesterday was the one we made with America Online. The reason for that is that in terms of promoting all of these great technologies that are being discussed here, we've got to get them into widespread use. We get up every morning and we think about browser share and we have a lot of creative ideas to drive that forward. But the partnership we have with AOL is certainly a centerpiece of activity. T[he] browser we're doing with AOL will be their standard browser for their members; it will be integrated [and] they'll do great things taking advantage of the Activ[e] Technologies and the integration will be seamless here. I'm very excited that today Steve Case agreed to fly out and talk to you a little bit about how he sees this partnership in the industry. So let's welcome Steve Case, the chairman of AOL, on the stage.

STEVE CASE: When we started America Online over a decade ago we believed [in the] possibilities [of] a new medium that someday would reach tens of millions of people. We made progression from the last couple of years going from 500,000 members to now over 5 million members. The reason for that is we really focused on consumers and tried to create services that were easy to use and useful and fun. Also we've been pretty pragmatic in using technology, recognizing what consumers have.

For example, Bill mentioned earlier people still have 14.4 modems and we're slowly moving to 28.8. Some of the things we do with impression and caching help accomplish that. The most important reason we think we've had the success we've had is [that] we've had a strategy of working with lots of partners and building a tapestry of alliances, and working together with a lot of companies in trying to build this medium. In the last few days we announced a number of alliances, particularly technology alliances [with] Microsoft, Netscape, and Sun. There's been a lot of confusion about what we've done because of so many announcements.

Bill has covered some of the key points. Internet Explorer will be our standard technology for our AOL brand [and] will go out to 5 million customers. When we ship our disk, we'll provide Netscape as an option. The reverse is true for our new friend where we build Netscape Navigator. Java will build on AOL and you can bet on that, and make it an extension of our Web strategy. The reason we're [working] with Microsoft is we're quite impressed with the technology and you'll see in the last day or two you're impressed as well. And also impressed by the new practical [approach] in Microsoft to figure out new ways to move forward and work together as a united industry, to move this industry and move this medium into the mainstream.

The reality is only 11 percent of households subscribe [to] any online or Internet anything, and 89 percent are sitting on the sidelines saying, "Why bother?" The opportunity is to partner with companies and figure out a way to reach that mainstream audience. It's not just partnering with big companies, it's also about reaching out to lots of creative minds and entrepreneurs to figure out their innovation. I am pleased today to announce a new program, an expansion of our greenhouse efforts to include software developers. A year ago we launched a content greenhouse and over the past [year] we've funded dozens of startups trying to find innovation in this new medium, and a few months ago we included software greenhouse for AOL—today we're supporting Internet developers. We want to talk to you, to provide capital and commit our distribution and marketing to take their ideas to 5 million people. It's going to be the mix of

funding and distribution that's going to unlock the power of this new medium. Sticking the [information] out on the Internet and hopefully people will find it, will not get plugged into large audiences such as we have in AOL. We want to create a new medium to reach millions of new people and take the concept of these online services to a mainstream audience. We're looking forward to working with technology partners such as Microsoft, and hopefully many of you, to make this new medium all it can be. Thank you. (Applause).

BILL GATES: One key point that Steve made there is the growth opportunity in front of us. Although every day we're out there surfing, most of the people aren't. It's a opportunity to bring people in, and what we're doing with AOL will foster that in a major way.

A few key points. This should be a very upbeat industry. The Internet is an amazing opportunity for great software. It will be intensely competitive but [will have] room for lots and lots of winners. If there's one [thing] you walk away from this conference with, it should be we're hard-core about the Internet—with all the positive connotations that implies. Finally, this communications revolution, as we're swept up in the day-to-day activity here, it's easy to forget what this can mean broadly; and it is fun from time to time to go out to schools and see kids starting to use this or to go to medical researchers and find out how it's facilitating their work to cure diseases, and see all the amazing ways that this is pulling together. So, there is no better business than the software business and it's great to have you all here. Thank you. (Applause).

THE SPEAKER: We took several of [the] questions and filtered through them last night and tried to come up with questions of different categories that were most popular. One of the most popular questions was: When will Microsoft have a majority browser market share?

BILL GATES: It's a good question. We don't—as we've been in situations like this, whether it's word processing or spreadsheet or file-sharing servers—predicting specific dates hasn't been key to it. I do think it is certainly our goal to achieve that; we're going to be doing a lot of creative things on the market side and technical side. Anybody here who has technology that can make a browser better, let us know; we're in the market for anything that people have there because we see the evolution being very rapid. So we do expect our share, which is fairly low today, to be very significant over the next year. Certainly to the point that people will be testing against us in exploiting what we've got, and that will start a positive feedback. So, this is our...the thing we think about all the time.

THE SPEAKER: Okay. There were lots of questions about tools. For example, which tool should I use for site development? Should it be FrontPage or Internet Studio or Jakarta?

BILL GATES: Of course, when somebody comes in to use the site, they won't know what tools were used. For most sites, it will be a variety of tools. Now managing this Web document type—making sure all your links are good, being able to preserve all the different versions, letting people annotate things as they come along—th[is] really does require a very sophisticated set of tools. For site management, for authorizing different pages, we have a lot of choices. All of those choices are built around [a] single set of extensions we're doing to HTML in these Active[X] Controls. One of the choices people have to make is between FrontPage and Internet Studio. Internet Studio is the equivalent of a desktop publishing package. It gives you incredible control over the different elements [of] the layout and those things; FrontPage is [equivalent] just to Microsoft Word, where wizards guide you through all the common scenarios. To really make sure the space is covered there [we] will [have] some overlap in the tools; you can go back and forth easily. If you want to switch to the other all the file formats are interchangeable.

THE SPEAKER: There are several questions about bandwidth. Specifically, this question: The biggest crisis we all face is whether the Internet backbone will be able [to] support all these millions of new users [who] are screaming [for] audio and video, [and so forth]. Can you comment on what efforts you [will] take to enhance the Internet backbone [to] avoid the crisis?

BILL GATES: The backbone is not a technological problem. That is, the improvements that are made if fiber data rates and switching costs are even faster than the improvement we're used to in the PC industry. There is a tiny bit of a business-model problem to make sure the on-ramp fees [generate] all the revenue for that connectivity business, that those are set properly and fundamental to people that make the backbone. For an economist it's interesting. You have a pricing model here that's not based on usage; it's based on the on-ramp that's different than the voice telenetwork. Usage driving pricing; it's a more direct feedback loop to where investments should be made to build capacity. I think because of rapid innovation that business model problem won't be difficult. The backbone is the easiest part; there's where you get the biggest economies of skill.

The biggest part is the local access. Particularly when you're talking about connecting up to MBone. There, we have to hope that either breakthroughs in wireless or satellite technology, or intense competition between the two access providers will get the prices for that down and make that effective. If there's any place there's a question, which will play a little different from country to country, it's more in the local than in the backbone.

THE SPEAKER: Okay. The next category of questions is really about [the] Windows platform and release schedule. We did take one question from the MBone, we're live-broadcasting over the MBone. When [will] the Windows [platform be] shipping. That's this summer?

BILL GATES: That's a safe prediction.

THE SPEAKER: The next question was in the corporate space: Yesterday during the national demo we did a demo of the SMTP popular news groups. How [will] Exchange public folders fit in this?

BILL GATES: The mail client that we're going to build into the Internet Explorer and into the operating system won't be as rich as the client that comes with Exchange. However, it will support bulletin boards with NTP and standard SMTP mail. The client will be a superset of that. We will have a future [version] of Exchange [with] the ability to connect through an arbitrary browser and use standard Internet authentication, and be able to look at public folders. You won't have to have the Exchange client to be able to browse the folders. That's what we call Exchange 4.1. For anyone using that, you'll get most [benefit out of] that for people using Exchange server. You'll get a richer client in terms of rich views on the public folders.

THE SPEAKER: A real popular question was how did you convince Steve Jobs to address the conference; how much did we pay him?

BILL GATES: Steve's unpredictable. We had no idea what he was going to say. It was our willingness to take [a] risk. Steve's done a lot of great things for this industry. Certainly one of the most fun eras for me was working with Steve on the Macintosh which was a pioneer for graphical interface. So, we were just very excited when Steve decided to put Web objects on [Windows] NT and chose to come here and talk about it.

THE SPEAKER: The last categories of questions centered around our developer support. Specifically, when will Microsoft product support be moved to Internet support.

BILL GATES: For most of the information we're providing, we're putting that out on the Internet today. We haven't had the ability to have special forms for our beta-test activities. We continued to focus on CompuServe there. Over the next year, a lot of that will move into MSN. So they have a mix for the private form things; we'll administer that through MSN over time, for the things that don't require the private forms we'll make sure it's on the Internet. Already all the material that's being presented at this conference, and all the things we have relevant to the Internet including betas for our Internet products, anybody can come and get it, the overload on

our servers today we [where we] publi[sh] those [is] pretty incredible. We have to get them replicated over the Net so we don't have a repeat [of] city Internet information server where we were overloaded for many, many days. Our goal is to get all the information out. If there's anything you think we're holding back, let us know because openness is how we're going to succeed in all of this.

THE SPEAKER: Okay. Those were the major categories. Thank you and I guess we'll go backstage.

BILL GATES: Thanks. Great to be here. (Applause.)