



**Paul Maritz, Group Vice President, Platforms and Applications  
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Good afternoon. I'd like to express my thanks for the opportunity to be here with you today. I'm Paul Maritz and I'm responsible for our Windows and Office and BackOffice products at Microsoft, which constitute the bulk of our traditional software offerings, the bulk of our revenue. So, most of the remarks that I'll have today will be addressed around that product line and I'll be happy in the questions and answers afterwards to take any comments about other areas of our business as well.

That business—the Windows, BackOffice, Office business— at some levels is a pretty simple business to understand. There are basically two major determinants of our business there. One is the number of PCs that get sold every year and then obviously what we can charge for our software and the penetration that we can get of our software onto those PCs. Now, obviously, the world is a lot more complex than that. But it's often good to remind yourself that it really is about these basic factors and what we should be doing with our research and development and our products and our product support strategies and our marketing strategies is to try and move these basic factors in a positive direction. And if you look at the number of PCs, then obviously there are factors that are beyond our control in that area. There are a lot of other members of the industry, other factors that affect that equation. I'll come back and talk about that in a minute.

In terms of the yield that we can get per PC, there are a lot of interesting factors that underlie that. The most important one being—What is the value that we can provide to the owner or operator of a personal computer in terms of the software that we have?

Another factor is to look at how we penetrate into various segments of the market. We roughly split up the marketplace into three segments. And it turns out that PCs sell about a third into those segments—companies with more than 500 personal computers, companies with 5 to 50 PCs, and companies with less than 50 PCs—including individuals.

Our penetration rates—our yield of dollars per PC— differs dramatically between those

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segments. In other words, we're getting a very good yield in the large business segment, more than 500 PCs. And we have tremendous opportunity to increase the return that we can get off of those other two segments. So, that's in addition to the fundamental value equation. It's something that we're trying to really understand as we go forward.

And lastly, the single biggest manufacturer of PCs in the world from our perspective is the pirated software PC. So, there's a large segment of the market that basically, at this point, we're getting no revenue from.

I just returned two weeks ago from China, where I was reminded even in greater emphasis of that point. China—depending on how you want to measure it—is probably the third largest economy today. We get less than one percent of the revenues out of China than we do out of the U.S. So, there are obviously opportunities to grow in areas like those high piracy markets.

Looking to the basic equation in terms of the number of PCs sold every year, I borrowed an interesting slide here from a colleague of mine—David Vaskevitch. And he found, somewhere, this chart that shows the penetration of various popular devices—technology devices—into homes in the United States. So, these are United States only numbers. And it shows the number of years that it took for that device to reach a certain percentage penetration of households in the U.S. And you can see, basically, how that curve has evolved over the years. The interesting thing is to plug a PC onto that and the Internet and other modern devices onto that curve. And you can see that we're really—to use those overall statistics—in the early phases of the growth of this industry. And when you take these numbers and extrapolate them out on a worldwide basis, you see that it's even earlier in terms of the grow cycle. So, we fundamentally believe that our industry—the underlying metric of our industry and our business—is a positive for us in the medium and long-term—that we have a long way to go before we can really realize the potential of this marketplace. And obviously there are things that we can do as an industry to affect that, in terms of how efficiently our people are able to manufacture semiconductors, bring prices down, how simple we're able to make the devices, how we're able to broaden the appeal of those devices. So, those are all things that we're focused on.

From another perspective you can look at the value proposition that we offer our customers. And it's an ROI equation like any other—people have to incur a certain cost to own and operate software. And they get a certain return in value out of it. And over the years we've been more focused on trying to sort of think about the value side of things and probably have taken our eye off the ball in the cost side of things. But that, over the last 18 months, we've put the emphasis firmly back on that. And we're working on trying to make our software dramatically easier to own and operate and to allow people to get lower costs through realizing the advantages of the semiconductor and the communications revolutions as those basic underlying factors become cheaper.

We've also tried to really think beyond where we are today in terms of the usage that people could get out of software running on a personal computer. And we think that there are dramatic steps that we can take there to help individuals in businesses more productively use information. There's some very hard technical challenges associated with that, but that is the kind of thing that we can...that kind of challenge can be really used to motivate and galvanize an organization. And our organization really does respond well to challenges like that.

And then there's the opportunity to really bring together computers and communication and open up a whole new different dimension for both individuals and businesses in terms of how they combine these two factors. And we think that this will have an even more dramatic impact on the lifestyles of most people, than the invention of the PC or even perhaps, ultimately, the telephone.

So, with that as backdrop, I think of the work that we're doing in and around these basic core products that we have—the Windows family, the BackOffice family of products, and our Office products—as falling into five broad themes that we're working on. Three themes are really focused on reducing cost. And two themes are really focused on improving the value that people can get out of our products. So, with those as sort of broad guidelines, I'm going to sort of roughly walk through each of those major product lines and illustrate how and what we're doing to respond to those five broad themes. Sorry, I'm going backwards here.

The first thing I'm going to talk about is how we've been building up a family of products to recognize- to complement- the developments that have been going on in the semiconductor industry. Microprocessors were initially targeted at the desktop at a price range of, you know, \$2000 to \$5000 devices. And with the advances in semiconductor technology, we can no longer apply the rates of performance that we can get out of semiconductors, and scale up in terms of the types of problems that we can address and also use the increases in the efficiency of semiconductor manufacturing to target the lower end of the market.

So, for the last 8 to 10 years, we've been working on a strategy to build out a family of compatible operating systems products that would allow us to span up and down that whole range of the market. And basically, today, we see our products as being divided into three major product offerings, from the Windows perspective. We have Windows 95 and Windows NT Workstation sitting in the center of the market targeting the broad desktop, laptop market. Windows NT Server is scaling upwards into the server market and into the large server market—the cluster market. And recently we introduced down at the low end, the Windows CE product which was designed to give us the legs to go down into the consumer electronic space. And you will see a variety of devices using that particular operating system. Our hope is that this will allow us and our partners in the industry—the software developers and the hardware manufacturers—to get large economies of scale of being able to develop products that have a lot of compatibility and be able to leverage our investments up and down the line, so that applications that have been written on one particular device can be leveraged into the other. This can be extended to networking characteristics so that you can get these devices to cooperate together in the Internet, and also to use technologies like our Internet browser which can be integrated with each of these products up and down the line. And we can share technology there. So, we work very hard to have compatibility up and down this product line.

In the last three to four years we've also been working on a family of server applications that we call the BackOffice family. You can think of those, in some sense, as extensions to the underlying platform in the sense that they are products that are designed to work in conjunction with other software products—like a database is designed to work in conjunction with desktop software and offer the backend database services to those products. So, we've been building out a family of integrated server applications. And this is very important as you'll see later on because it is the basis of our strategy of not just being in the database business, not just being in the electronic mail business, but really

being in the information management business where we believe you have to be able to master each of those technologies and integrate them together in order to take customers to the next level of value.

Results of that strategy have been fairly positive. As I said, it's something that we've been working on for the last 8 to 10 years in making the transition off DOS, laying down the foundations for Windows, putting in place the underlying operating system technology foundations. And the result is today that, of the installed base of personal computers in the world which, if you think about it is about 300 million today, of any description or vintage of personal computer. We now have over a hundred million personal computers running a 32-bit version of Windows—either Windows 95 or Windows NT. And we've seen the broader industry respond strongly to that. By our best ability to count (and we deployed outside market researchers to really research this market and give us ongoing quarter by quarter statistics) is that there are over four million people in the world today who write Windows-based software for their living, one way or the other. And they generate, directly, about \$100 billion worth of revenue off of those products. A market with an opportunity of that size obviously attracts developers. And if you'd narrow that down from basically people who write software for their living to people who are classical commercial software developers which are directly selling their software in the marketplace, by our estimates, 90% of those people are now targeting the Windows platform. That's up from 75% a couple of years ago. So, we've seen that statistic going up.

And you can see other sectors of the market starting to respond to that opportunity as well. Traditional UNIX vendors, for instance, who are used to targeting platforms like the Solaris—Sun Solaris platform—and are now moving to target the Windows NT platform, seeing an opportunity to increase their sales and sell it to a larger market there. In particular, we've been working on building off our traditional strength on the desktop and moving into the server market because we believe in a distributed client server world. So, a key part of our investments in Windows NT was to lay down a platform that would not only work well on the desktop but would give us a high degree of compatibility and the features that we needed for the server. And we've seen the Windows NT Server business, which took off about two years ago in the Fall of 1995, grow extremely strongly; and has grown essentially on a quarter by quarter basis and continues to grow very well, as well.

In our last financial year—as you know our financial year runs from mid-year to mid-year—we sold over a million copies of Windows NT. And that basic strength continues in that market—in that sector of the market. Windows NT is a critical platform for us, because it is giving us the technology that we will use across an increasingly broad section of the range of computers. And we've been working on that for many years now. The first line of Windows NT code was actually written in 1989. It's gone from about five million lines in its first release—that 3.1 release back here—to its latest version which is version 5 which is into test recently. Version five is now 25 million lines of code. So, we've seen a five-fold increase in the amount of functionality in that product, over the last five years. So, a tremendous investment there and the result of basically a team of over a thousand people who work in and around the Windows NT code base. We're working on this very important release—NT version 5. It has been released in its first test version. With software of this magnitude we have to go very carefully and expose it to a lot of people to make sure that we have both the compatibility and the functionality and the reliability and the scalability that we need in the platform. And we will build up to

another major test release that will happen in the first half of next year.

From the BackOffice point of view—in addition to laying down that operating system foundation—as I said, it's a critical part of our strategy- is that we've been building up these extensions to the server environment to allow us to not only solve today's problems but set us up to solve tomorrow's problems as well. And the three major members of the BackOffice family at this point are our SQL Server database, the Exchange messaging or mail server, and the Site Server product which is a collection of tools that basically extend the basic Internet Information Server—the basic HTTP Server that is built into Windows NT. Windows NT Server comes with the basic ability to serve Web pages and function on the Internet. And Site Server extends that with a set of tools that allow you to basically do electronic commerce, analyze your site traffic, manage your site, etc. We've just, yesterday, actually released the latest addition of that Internet Information Server that is built into Windows NT Server. It's a very important release for us because it continues on this theme of building out the operating system into an integrated set of functions. It, in particular, brings together our Internet Server technology and our Transaction Server Technology because we believe that as people want to do more and more serious things on the Internet, you're going to need to do them in a very robust and secure way. And that means that you have to marry together these two technologies of Internet Server technology and transaction technology and bring those together into an integrated set of functions. Another interesting thing that we're doing, going back to that theme of how we more precisely target our products at the various segments of the market—large business, medium business, small business, etc., which we believe is a tremendous for us to grow our revenues, to get higher penetration, is that we've started to segment our product line and have products that target more precisely the various customers in that segment, whether they be small businesses or departments within a large business, etc.

So, we've taken our basic server products—the BackOffice products and Windows NT Server—and now offer them basically in three additions. There's a standard edition, a small business edition, and an enterprise edition. The small business edition is perhaps the most interesting one. It's one where we've worked very hard to try and turn that speed of products—the operating system and those server applications into an integrated suite in the same sense that Office is an integrated suite today. And we've released the first version of that product. And our metric—our goal for that product- was that we could basically go into a small business with 25, approximately, computers or fewer computers and ask them essentially two or three questions. And the questions being like—what's the name of your business—do you want to be operating on the Internet? How many users do you have and what are their names? That's all. Those are the kind of questions that you have to answer. And then leave that business with a functioning server that connects all their PCs together, that connects them to the Internet, that has automatically registered their domain on the Internet, leaves them with a functioning electronic mail system, a functioning database, a functioning fax server—basically all of the elements that a small business would need to basically get more value out of their PCs, exchange information between their users, and inter-operate with the Internet. And we've just released that product. And we're very excited about it. We're trying to really educate a broader channel to take advantage of that product. And it'll be a very interesting experiment to see whether we can grow our business in that critical medium and small segment of the marketplace that is very under-penetrated by anyone in the computing industry today.

The other thing we've been working on in the other direction which is to scale up. So,

we've been working not only on the underlying operating system but on the server applications there. And there you've got to look in terms of the throughput of the combination of the operating system and the server application. A good example is the SQL Server database running on Windows NT—the enterprise editions of NT 4.0 and SQL Server 6.5. And what you see there is we've been able to lift the performance on that product by a factor of nearly six over the last two years. That's a combination of using more powerful hardware and actually improving the software. And we're also gearing up for another release of SQL Server and SQL Server 7 that is in beta test now. And we hope to ship it next year—calendar year 1998. That'll really be a tremendous release for us. It's a release that's had a tremendous amount of work put into it. And we believe that it will take us on the next leg of scalability here. And in particular, it has many of the features that will support applications that have been really tuned to the Oracle environment today. When people talk about UNIX applications, as you know, they really mean Oracle applications, or applications that have really been tuned to that environment. And there's certain key features that you need to implement if you really want to be able to run those applications well. Those will come in the SQL Server 7 version that we're now working on.

Exchange has really been a tremendous story for us over the last 12 months. We introduced Exchange, if you remember, back in March of 1996. So, it's really been in the market only for 18 months at this point. We worked very hard on that product to make sure that when we released it, it would be an enterprise-ready product, that it would scale to handle tens of thousands of users, that it would have the characteristics in terms of management that would allow people to really deal with it and manage an organization that was connected together with Exchange. And that effort has really paid off. For the first time we worked extremely closely with our customers before the release of the product. We had about 30 customers who gave us a lot of input to that product. And one of the metrics of releasing that product is that we did not, in fact, introduce it until all 30 of those customers had deployed in large numbers. And it's an experience that, now learned, we will repeat actually with NT 5. So, we're developing the same kind of early experience problems for process of NT 5.

The net result is that today we have large customers—or two customers, in particular—that have a hundred thousand users connected and operating on a daily basis with Microsoft Exchange. I think apart from IBM's own internal usage of MOATS, that the next probably three or four largest email networks in the world are all based on Microsoft Exchange, at this point in time. So, that's a product that's really proven itself. And we're starting to see the design wins come in now. So, we're starting to, on the basis of those kinds of testimonials, really start to see top down decisions being made in a large number of companies for Exchange.

The other key theme that we're working on is to try and improve the value equation for our customers by really tackling cost of ownership head on. And there are two basic strategies that we are using there. The first strategy—and in fact, the less important of the two strategies—is a hardware based strategy where we're extending out the range of options that people can use...of devices that people can put on their desktop. There's work that we've done with others in the industry around the Net PC. The Net PC is, perhaps, one of the most misunderstood concepts in the PC world today. The Net PC is just basically a cleaned up PC specification. There are certain things in the PC that make it harder to manage than it need be—like the old ISA bus—that allow you to do pretty good hardware, automatic hardware/software configuration, but not complete 100% guaranteed hardware/software configuration. The Net PC, for instance, gets rid of the

ISA bus. It just says—we have to use a modern bus like the TCI bus or USV bus or etc. So, it's really just a tightened up PC specification where we've run and said, sort of—here are some things that if you tightened the spec of what a PC is, we basically allow you to have a better chance of having lower support costs on that machine.

The other aspects of the hardware strategy are to allow people to use very low-cost devices instead of a PC on the desktop. And this is an artifact of that compatibility that we built into our product line, between client and server. From day one we've insisted that every time we release Windows NT, we release it in a client version and a server version. And they run exactly the same programs. But having imposed that discipline on ourselves at every step of the way, that means that any program that will run on a Windows NT Workstation machine will also run on a Windows NT Server machine, which means that you can essentially run all your programs on the server and simply direct the display and the keyboard down to the desktop which gives you the option of having very inexpensive devices—\$200-300 devices on the desktop. And that's the technology that was first introduced by Citrix which we've now got an agreement with them to roll that technology back into the operating system that basically relies on that compatibility between client and server, that we built into Windows NT from day one.

The more important strategy for reducing costs is something that we call our zero administration initiative and it applies up and down the line, independent of the type of desktop device you're using—Net PC, PC, Windows terminal—it doesn't matter. And what we did there is we spent a lot of time talking to our customers and saying why is it that you're telling us and others in the world that you're having to spend \$4,000 to \$5,000 a year to support, own, and operate a personal computer, which is obviously a lot more than the hardware and software costs. And we really dug into that in a lot of detail with customers. Even looked at the non-development expenses of Microsoft to look at what it was costing us internally at Microsoft to provide computers to our administrative sales and marketing staff. And low and behold be found that we were spending anywhere from \$3,000 to \$5,000 a year. And there's quite a large variation there between what customers spend. But there's a significant cost there. So, for the last 18 months, we've really challenged our engineers to attack the fundamental causes of those costs. And the strategy is basically to take all the touch out of managing a computer desktop. What we found is that about two-thirds of the cost of owning and operating a desktop machine because people were having to touch it frequently in one form or the other. Any time there was an operating system upgrade or an application upgrade, somebody had to go out, sometimes even physically go out to the machine and fiddle with it.

So, we've gone through and tried to systematically eliminate all of those needs to touch a machine. And the metric that I gave to our engineers is I said I want to be able to walk up to a machine in my office, unplug it from the wall, unplug it from the network, and throw it out the window, and bring in another personal computer that has no software on it whatsoever—no operating system, no applications, no user data. And I want to plug it into the wall and plug it into the network. And I want to continue working where I left off. In other words, everything has to basically automatically restore itself not only install the operating system and all my preferences back, all my documents back, etc. And I want to be able to do that with my laptop as well. So, this must not only work, you know, when I'm always connected to the network. I want it to work when I'm just sometimes connected to the network. And it's that capability that we call our zero administration Windows work. And that work will be most fully manifest in Windows NT 5.0. It will be fully implemented in Windows NT 5.0. You will be able to do what I just said, in terms of owning and operating a personal computer. We believe that that will take a major bite

out of the costs and complexities of PCs. Which brings us to another topic I often get asked on. So, I'm just going to—before I get asked a question—talk about it, which is Windows PCs versus NetPCs.

You might be somewhat surprised that we think that Windows PCs offer a much better value proposition. And there are actually some important reasons for that. Firstly, the hardware requirements of a PC and a NC are not that different. NC, as they've started to come out today, if you want to have serious local processing, for instance enough local logic to be able to run an Internet browser, which is not a simple piece of software anymore, you have to have a reasonably fast processor and enough memory—typically 16 to 32 megabytes of memory. You have to have a screen, which is the most expensive component in any computer today. You have to have a keyboard and a mouse. And you have to have a power supply. And you have to have a network connection. And you say—well, what else is left over that we can save? Well, maybe we can save a disk. Well, the disk industry today is one of the most efficient parts of the computer industry. You can't buy a disk—even if you want to—that's less than a gigabyte in size—and they cost in the retail store about \$125. On an OEM basis in volume they cost about \$100. So, there's about \$100 worth of cost that you can really take out of the environment. And if you really wanted to take that \$100 worth of cost out of it, our Windows NT 5.0 will run diskless, so it'll actually run off the server completely if you want to do that. What you give up is the full compatibility of the Windows environment, where it runs all of today's software—all Windows software, all Internet software, all Java software, etc. So, the issue is—why give up that tremendous flexibility in order to potentially save literally a few bucks. This isn't a very good value proposition. So, depending on how you think about a network computer—if you either think it's going to have no local processing power, then it's an expensive terminal. If you think it's going to have enough local processing power to run, for instance, an Internet browser locally, then basically it's going to be a PC in all but name, but in fact, an incompatible PC. And this is a message that has now started to resonate.

Another key thing that we're doing in our environment is to recognize that we are in the midst of an extremely important communications revolution. This is kind of truism, but it's hard to overstate the importance of it. And there are a number of major benefits that will come out of that. So, what we're trying to do is to make sure, as we evolve our software forwards, we make it easier rather than more difficult for people to take advantage of that public network—the Internet that is being built out before our eyes. And there are a number of ways that we are doing that integration. First of all—at the more prosaic level that doesn't get reported a lot on, but is probably in the long run, the most important level—we really are integrating the basic networking functions, as defined by these Internet standards into Windows. But you can automatically extend your internal network to seamlessly integrate, as seamlessly as possible into this broader public network and move information of all types to and from people within your organization and between your organization and your partner's organization, and do so in a secure way—a secure and controlled way, which is why technologies like you'll see on the slide, such as the integration that we're doing between public key based security technology and the internal security built into Windows, are going to be very important advances.

We're also integrating from the user interface level in terms of trying to give people a common view of information. We don't want people to have two fundamental different paradigms that they have to deal with, if it happens to be information coming off of your local hard disk or information coming to you across a wire from the Internet. So, taking



those page and link paradigms that the incident has given us and building those in a fundamental way into Windows is another key thing that we're doing. And Internet Explorer 4.0 is big step along that direction.

The other theme that I want to touch on is adding value. And this is a long and very interesting theme. So, I'm going to really touch on it at a fairly high level. We think that there's a concept and you can think of it as a marketing slogan that is something that we're using to really focus ourselves and focus the debates and discussion with our customers. There's a fundamental break-through that we're going to undergo over the next five to eight years in terms of how people can deal with information. And it's all to do with how you combine structured and unstructured information. A lot of companies have built up an infrastructure for dealing with planned processes—how you deal with your monthly payroll, how you deal with your annual budgeting process. People are starting to build up an infrastructure that helps you deal with unplanned or unstructured events—some crisis occurs and you fire off email to a bunch of people to get them to help you collaborate and react to that. And the big challenge is—can we bring these worlds closer together? Can we use the underlying infrastructure to allow you to have better support for dealing with both planned and unplanned events in a more integrated way—which means pulling together structured and unstructured information, allowing you to rapidly compose automated support for processes that may be changing according to the environment that you find yourself in.

And we've recently started to articulate to our hard-core development community a framework that we will use to attack those problems. And we pull up the Windows DNA framework. And it is a set of architectural guidelines that will be guiding how we put new functions into the operating system and into those server applications and ultimately to our client applications, to try and get that synthesis between the structured and the unstructured world.

So, what Windows DNA is about, which we've started to lay out for the first time to the development community at a major developers conference we had a couple of months ago, is focused around this synthesis of, on the one-hand structured and unstructured information; on the other hand, paradigms of computing such as client server and Web-style computing. So, we're trying to bring those together into a common framework. And we think that that will have, potentially, very large pay-offs down the road. And it goes back to that theme that I articulated earlier of why we're not just in the database business with SQL 7, why we're not just in the Exchange business. We're not just in the database business to compete with Oracle. That's actually a secondary objective. The primary objective is to help lay down this infrastructure that will get this new level of functionality that we want to achieve in the future.

Another question that I often get asked—so I'm going to answer it before I get asked, what's our view on Java? And to really understand this, there are three different ways in which the word Java gets used. And it's important to be able to understand those usages. The first way that Java gets used is it's a programming language. It's a simplification of the C++ programming language. The second way it gets used is to talk about a set of programming tools that support that language definition, which have some interesting properties in terms of the run-time environment underneath that—the way that it handles the support for writing objects, the way that it handles the ability to run on different instruction sets, etc. And the third way in which Java gets used is as a set—to refer to a set of programs written in Java—so-called cross-platform libraries where people—Sun in particular—are trying to encourage people to think of that third usage of

the word—these programs written in Java as a virtual operating system.

In other words, they're trying to say—when you write programs in Java, you shouldn't access the underlying operating system. You should, instead, access these libraries that act as a surrogate operating system. Our view is that we support the first two uses of Java. Or we think it's an interesting programming technology. It has some interesting innovations in this run-time environment. We're going to embrace those—in fact, extend them to other languages because there's no reason why they should apply only to that syntax, that we can apply a lot of the same benefits to people writing in the Visual Basic syntax, or the C++ syntax. Those will become general services that we offer—programming languages in general.

In the third sense, we disagree with Sun. We think that there's no need—in fact, there's some real disadvantages—in trying to build an operating system on top of an operating system. First of all, you put essentially a lot of overhead into the environment. And secondly, it's actually quite a hard thing to do. This is not the first time that we've seen people try to do that. And once we've picked off the low-hanging fruit, trying to really expose the rest of the functions in a general purpose way and try and have them function the same way across all operating systems, it starts to get really hard. Basically, you have to develop a whole complete operating system. And then you've got two operating systems using twice as much memory sitting next to each other in the same machine. So, that's the basis of our differing views on Java—between Microsoft and Sun.

The last thing I'm going to touch on is Office. Office is clearly a major product for us—a huge part of our revenue. We're extremely excited about Office. We think we've actually been starting on a whole new generation of Office products. We've gone from the 16-bit version to the 32-bit version of Office 95, now to Office 97—each of those adding in tremendous amount of functions. With Office 97, we finally reached a truly integrated suite of products. We started on Office in, I think, 1990 when it was really Word with a coupon on the box for Excel, to the point where we really have delivered on that original vision on a suite of products that share functions, work in common, work the same way, the ability to really move information back and forth very easily. So, you see common 2D graphics, common menus, common toolbars, common help systems, common answer wizards, etc., now built into that product.

Having done that basic work we think there's some very interesting things that we can do with Office. The first is—in keeping with the other themes—is work on cost of ownership. There are a lot of things that we can do to basically get applications to essentially fade into the woodwork from an administered point of view—that in the future you won't install applications at all. They'll just be there available to you. They'll be self-healing. So, if you, by some chance, go in and delete a file off your machine the application will automatically, without you realizing it, know how to repair itself. You will just basically use whatever documents you want to work on. And wherever you are the application will make itself manifest. We'll get to the point where you install applications to people rather than to machines. In other words, you equip people to a certain set of capabilities. Beyond that there's a lot of things that we can do focused around that same theme of intelligent collaboration—making Office the front-end tools to help people really deal with closed structured and unstructured information. So, we can go from just being in the spreadsheet business to really being in the data analysis business. We can go from being just in the word processing business to really being in the collaboration and publishing businesses. And we have a tremendous foundation now to build those even further value-added functions that we think will help really drive value and the value proposition in the

future.

And then beyond that, coming out of our research world, we're on the threshold—I'm not going to say this is going to happen next year, but it will happen over the next five years, where we start to dramatically use a deeper understanding of natural language. And we can bring together the research work that we've been doing, not only traditional recognition technologies like speech and handwriting but combine that with the semantic analysis that we're now starting to be able to do, to really understand what people are being able to say, and actually use that to help and correct the recognition processes.

So, that quickly gets me through those five major themes. And I'd be happy at this point to take any questions.

**QUESTION:** Okay, I'm going to ask one quick question, Paul, and then we'll throw it open. The question I get asked the most is—When is NT 5.0 going to ship?

**PAUL MARITZ:** I wish I knew that myself.

**QUESTION:** Where do we stand in terms of time?

**PAUL MARITZ:** As I said, it's a major release and one that's so important that we have to get it right. We can't afford to have that release not fire on all cylinders when we set off from the start line. So, we're taking it in a series of major steps. Typically, in a release we go through the following major phases: when we start using it internally, when we turn it over to developers to allow them to work with it; when we do the first real beta test release for end user corporations where we tell them that it's feature-complete—everything is there—and now we're trying to find oversights and holes; and then when you finally release the product. There are typically, depending on how you go, three to six month increments between each of those steps.

We're past the first two. The developer release happened back at the end of September at our developer's conference in San Diego. So, we're now building up to the next major step which we hope to take in the first half of next year, when we'll put it out to major customers, in large numbers.

**QUESTION:** So, in the three to six month timeframe, we could expect it by March?

**PAUL MARITZ:** I would hope so. But we'll see.

**QUESTION:** Okay. But the timetable that's been roughly out there—September Quarter shipment—hasn't slipped as of this point?

**PAUL MARITZ:** I'm not going to disagree with that one way or the other. But there's no new data that we're concerned about.

**QUESTION:** And do you think it can have a positive affect on PC industry growth?

**PAUL MARITZ:** I think it can have the following affect in the sense that I think that it will help pull infrastructure through, into businesses, both server and client infrastructure. There are a lot of features that we know, like the cost of ownership features, like the scalability features, the administration features that resonate very

strongly with our business customers. So, I think that will ignite a wave of growth there. NT 5 has less to offer consumers. In some senses it just brings NT up to the same level of fit and finish and polish that Windows 95 has had. So, at that point we can really say, with a straight face, that there's no reason why anyone, if they have sufficiently powerful hardware, should prefer Windows 95/98 versus NT.

**QUESTION:** Why don't we see if there are some questions from the floor. If not, I'll keep going. On the consumer side—while they're seeking out questions—on the consumer side, what are some of the new things that you think could drive demand? You know, that you're building into the OS?

**PAUL MARITZ:** Well, Windows 98 actually has a lot of features in there that are being specifically put there at the request of the hardware industry. In fact, Windows 98 has two major functions in it. One is it carries, as a native component, Internet Explorer 4.0 integrated to that environment. The other key feature that it has is actually support for our new hardware such as the advanced graphics port that Intel has. It'll give us a big dramatic step forward—up in 3D graphics performance. It'll have support there for integrated TV viewing technologies. It has the latest DirectX features, again, talk to high-performance multimedia and graphics. And it has very good support for the latest generation of easy to use peripherals—which will be really important when we start to use video cameras as a natural extension of your PC and photograph 10 seconds of the grandkid and send it off in email to grandma and things like that. So, there's a lot of integration with consumer electronics-type functions that will be coming in the near term that will really help on that. Beyond that, we do have a lot of deep thinking going on about—you know, how do we take a big step forwards in terms of simplicity? You know, we're not proud of the fact that everybody has horror stories to tell about how they bought a new personal computer for their mother and spent the weekend trying to get it to work, etc. And there are a lot of things where you don't...

**QUESTION:** And that was a Microsoft engineer...

**PAUL MARITZ:** Right. Myself. The...you know, things like error messages, for the average person, should just go away. I mean, there is no excuse for that.

**QUESTION:** Okay. We'll keep going. Again. If somebody has a question, just get one of the mics near you. Over here?

**QUESTION:** [Inaudible].

**PAUL MARITZ:** ...from a fellow countryman of mine, if I detect the accent. The question was—How much how much would it add to our bottom line if we could decrease the rate of piracy by two to three percent? Well, you know, depending on what denominator and numerator you're using, you can get different answers to that. But the point is that any time that software, being inherently basically...or you know a zero manufacturing cost business, any time we can get a pirate to pay us some money, that drops right to our bottom line, because we've incurred all the R&D costs and marketing costs associated with that software. So, we are thinking a lot about piracy. There are features in the latest Office 97, for instance, that we had a key disk in that, that after you installed (I forget the number) more than five times or something like that, starts to protest. We've also started to run some trials. We did a trial recently in Hungary with the stand-alone version of Word that's deliberately chosen to be something that, if we screwed it up, wouldn't affect our revenue. And either way, we required people to register that software. So, you

had to call up to get an install key before you could install the software. And we did that just to test the mechanisms of how people would react to that. And we're going to run a larger trial in another country and take that further down the steps. So, we're trying to think through things that we can do that on the one hand will have an impact in the area of piracy that we think we can really make an affect in—which is sort of casual copying in the home and small business environments. Depending upon the country, in the large businesses there isn't a lot of upside. I mean, most businesses in the US and Western Europe, there's some piracy going on but it's not pervasive. People are...particularly as we put in place these volume purchase agreements, etc. are coming into the arrangement where the revenue is pretty predictable and they're basically isn't a lot of upside there.

Then there's large scale counterfeiting which requires a whole different set of issues to deal with. In the third world countries, there is a tremendous amount of upside. As I was saying, I was just in Beijing two weeks ago and met with a large Chinese entity that will remain nameless. They have over 100,000 personal computers and they've standardized on Microsoft Word. They've paid us for five copies. And they were giving me a hard time about bugs in Word. The good news in that case, though, is that they have decided to pay us for Windows NT Server, which they're now installing. So, they're realizing that there's a limit to what you can ask for in support without paying for the software. So, we've gone from a situation there where we were getting nothing to where we'll probably get \$2 million from that account this year. But that's a very early trend in that area. So, it's something to really think about.

**QUESTION:** Isn't it still over 1 to 1, if you were doing it worldwide?

**PAUL MARITZ:** It's very hard to get a handle on what it is. I mean, there's so-called machines that are not...that the piracy going on at the OEM level where people are shipping machines with no operating system and saying—go find the operating system—there we think that that's probably on a worldwide basis, less than 25%. When you get up into the application software that gets too large of numbers there.

**QUESTION:** Okay, just one question on bandwidth. That seems to be something...I remember going to talks that you or Bill Gates gave a few years ago, and we were supposed to be already there with ISDN. So, what's going to break this log-jam and get this thing going?

**PAUL MARITZ:** Well, I'm going to sound a bit like the reformed alcoholic here, so...I think that we are on the verge of a bandwidth breakthrough. Now, I realize we've cried "wolf" on this many times. The reason is—for the first there's a technology that's actually over-achieving what was promised for it, which is ADSL technology. We have, today, 200 employees at Microsoft—something we're doing in conjunction with GTE—who have ADSL modems running in their home. And the big difference between ADSL and ISDN is that ADSL—the signal gets stripped off your telephone wire before it hits that central switch. And one of the reasons ISDN was always a mixed blessing for the telecommunications companies is that if people really started to use it, they would choke up those switches. So, they were always ambivalent about whether they wanted to see it take off or not, because they had worked these expensive switches and provisioned their switching bandwidth for calls that lasted no more than 10 minutes and no more than 10% of their lines were in use at any one point of time. The great genius of ADSL is that they take that data signal which is overlaid on top of your voice signal and it doesn't disturb your existing phone service. So, they're only just using that last piece of wire into your home.

The rest of their voice infrastructure is unaffected. And they can feed that data signal directly onto the Internet. The great thing is there's no concept of dial-up, either. You're either on the network or you're off the network. So, we have people—those 200 employees—their PCs at home are permanently connected, via ADSL on the Internet, to our corporate network. So, when they go home at night they think of their PCs at home the same way as they think of their PCs at work. They're just on the network 24 hours a day.

**QUESTION:** But isn't it still pretty expensive?

**PAUL MARITZ:** Well, it's coming down in cost. I mean, we still have to pay several hundred dollars for the modems. And apparently there isn't a standard yet between the modem you put on the PC and the modem you put at the switch. We're going to take that up to, over the next two months, to a thousand of our employees. And it's working very well. It's very reliable. So, I think that over the next few years you're going to see an explosion in ADSL technology. And the great thing about it, it's all-incremental. They don't have to worry about it cannibalizing their existing voice infrastructure.

**DIFFERENT SPEAKER:** I think we're going to cut it here, Paul. It's getting a little late. Thanks very much for coming.

**PAUL MARITZ:** Thanks.

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