Consumer Electronics Show
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CRAIG BARRETT: If I only got that introduction at Intel each day when I showed up to work. (Laughter.)

I want to talk about the transformations that are happening in the world today. I want to talk about what's happening, the convergence in computing, communications, digital content, how all those things are coming together, and how that technology is being used, how the technology is transforming us in every aspect of the way we live our life.

If you look the transformation we're talking about, it's driven by computing power and communications capability, and increasingly the communications capability is broadband, wireless capabilities.

And as you can integrate those key features, ever more powerful compute capabilities, ever more powerful broadband, wireless capability into silicon devices -- put those devices into systems and then combine then with high powered software, we bring consumers capability they could only dream about a few years ago.

So I want to talk about that today really in the context of three areas: the digital home, which is this phrase that we all use a lot but it's really the home with digital content and being able to move that digital content at will between devices; we want to talk a little bit about digital lifestyles, how the capabilities that we're bringing the world can affect the way we live from an education standpoint, from a medical standpoint, from just how we access the information around the room in our everyday life. And then we'll try to finish up with a little bit of what happens as the whole world becomes one and we have this digital capability everywhere, seamlessly available so we can transport ourselves and our capabilities from one country to another, one continent to another.

So what happens when we operate in a digital universe where we have this capability around us all the time?

So we talk about those three aspects and we will talk a little bit about the consumer – a very different kind of consumer today. I remember vividly about ten years ago sitting at a dinner party in Arizona where I live, and was with about ten folks of my age, mid-50s at that time, and it was when the PC was becoming popular and I casually asked them at the table, "Well, how many of you use the PC?" No one raised there hand. And I said, "Well, PCs aren't any more difficult to use than ATMs." So I asked the ten people at that time, "How many of you use ATMs?" One person raised his hand. I was astounded. And I said, "Well, how do you guys get money?" (Laughter.) And the other nine people at the table said, "It's simple, I write a check, I give it to my secretary, they go to the bank and they get me money." (Laughter.)

Well, those are not the consumers that I'm talking about. (Laughter.) I'm talking about the youth of today, the youth of today who are familiar with technology. They accept technology like it was riding a bicycle. They multitask; they use technology every day in every aspect of their lives.

And you can get a feel of that around you today, things have changed dramatically in the last decade. In fact, if you look at the poll that was just taken over the Christmas holidays in the U.S. about how many people were going to buy a digital gadget for someone for Christmas, over three-quarters of the people responded in the affirmative, three-quarters of Americans planned to give digital gifts for Christmas.

And this wave is sweeping us and it's really the idea of anywhere, anytime, anyplace, anyhow, coupled with the personal aspect, personal like personal computing. Personal computing means I want my computer, I want my data, my information on it, but what we're talking about today is I want my capability, my entertainment, my content, my personal content and I want to be able to access that anytime, anyplace in any form I want.

And that changes a lot of things. It changes the way we deliver information, we're not talking about single users, we're not talking about single applications, we're not talking about single locations.

So we have new platforms to create, new capability to create, we're talking about high performance, multi-purpose, low-powered devices, affordable devices that could be used anywhere.

And one of the new features that are coming out from a computer standpoint is multiprocessor capability. We've had virtual multiprocessing capability for the last year or so, something called hyper-threading or virtual dual processing capabilities. We're now moving that into the physical mode where you have two processing cores within each microprocessor to handle two separate streams of information, two different things at the same time.

But this whole concept of the two core capability is not only two physical cores but then virtual cores within those physical cores. We can talk about future multi-core, multi-threaded capabilities, with each one of those threads and each one of those cores being able to do a separate function at the same time, enhancing the capabilities of the consumer. You'll see this delivered this year in '05 and in volume in '06.

We're really here though to talk about the digital home, the digital home capabilities and what's going on in the digital home. And the digital home, as we all know, has gone from analog to digital as entertainment content has gone from analog to digital. And as that's happened, we've all wanted to experience our digital content in the way we want to experience it, we don't want to be stuck in one room, stuck in front of one screen, stuck in front of one set of speakers, so we want on-demand capability regardless of where you are in the home, regardless of where the source of the content is. And this is really what the digital home is about, it's really multiple entertainment experiences streamed simultaneously to various devices -- devices of your choice.

And it's really not what I have in one of my homes today. My wife and I have a ranch in Montana, built a home four years ago there, I put a great media center in, it's beautiful, I love to take guests there and show them the three seven-foot racks of electronics that I have. Services the whole house, all the speaker systems, the video systems, everything else; it also heats the entire house. (Laughter.) In Montana in the winter that's a very useful feature, we just leave the closet door open to the media center and the whole house stays warm. That's not what we're talking about here.

We're talking about things like the entertainment PC and that's really the bedrock to the digital home. The entertainment PC is really the capability to do all sorts of things, store content, create content, distribute content. It's really the hub of the home network and it's the gateway to content.

And there's a whole new generation of powerful consumer electronics devices and PC type devices that can speak to one another and they're really related to the entertainment PC. So this is really I think the hub of the digital home experience we're talking about, content where you want it, when you want it, how you want it.

You know, last year Paul Otellini, our president was here presenting and he showcased some prototypes of the entertainment PC and just to show you how far we've come in that 12 months today there are about 20 different OEMs who are delivering entertainment PCs, this center point for entertainment and distribution and content creation.

The e-PC is going to continue to evolve. We know that tomorrow's content is going to get richer, we know that the capability coming into the home is going to be better, that broadband is going to continue to improve. We're going to have more video, more audio, more channels, more images. Consumers will be more sophisticated. And as you get more people who are users of the technology in the house, we're going to have more users at the same time with the PC.

If David Sidd would come out. David and I are going to have a little bit of fun here and we're really going to demonstrate what an entertainment PC of the future -- and by the future I don't mean ten years but let's just assume that we're going on the same timetable we were last year when we talked about this topic, this is the sort of thing you're going to see 12 months from now.

And this is really a platform with a dual-core processor capability, high definition audio, high definition video; that's kind of the easy part, that's the hardware aspect of it. The real challenge is to make this thing work in an easy fashion, make it content accessible. So what we need is some good software on this and in this instance for this demo we have some software from Vizible and it's going to help manage, navigate, search. We've got different audio, video, broadcast feeds, games, images from local PCs, other devices or the Internet. And so what we want is a simple interface such that we can access all that content in a simple fashion, we can browse, play files with a remote control.

David, why don't you show us what you can do with your remote over there?

DAVID SIDD: There it goes.

CRAIG BARRETT: You know, what we don't necessarily want is just a flat projection of what capability we have, perhaps a spherical projection, 3D projection of that. David can pick out any one of these with his remote and he can blow that into a bigger image for us to look at. He's on a mountain climbing expedition if he's in the Grand Canyon or something like that, we can do that.

What I really like about this though is these remotes are passé; you lose them, the batteries run out. So I want David to not use a remote; I think we just ought to go back to the old fashioned hand signals, wave at it, make it work. We can search for a movie trailer, we can play that trailer, see if we like that. We don't need the remote anymore; I don't know who makes these. (Laughter.) I don't know who used to make these. (Laughter.)

Quality experience, high def, picking from a variety of sources, easy to do it, all automatically connected, displayed, presented.

And I think the great thing here is the ease of use aspect of this. We don't want to spend time and energy organizing, sifting, searching; we want it to be the way we want it, immediately present.

David, take this. (Laughter, applause.)

DAVID SIDD: Keep going. (Laughter.)

CRAIG BARRETT: That's the e-PC of the future: high def screen, entertainment PC in the background doing all the work.

Now, we could extend that experience and what we're talking about is not just the computer power but the wireless capability that goes with it. Let's talk a little bit about extending the e-PC to various other devices and doing that with digital media adaptors, these adaptors which allow you to do wireless connectivity between a PC and different types of devices.

There are lots of new devices coming in the marketplace, new CE devices, in fact, with built-in DMAs. We have one example over here, which is an LG TV, basically a smart TV with built-in DMA in it, which is you can now display streaming video from cable, satellite, your home network.

We have other devices over here. We have some Linksys DMA, which enables wireless access to premium content. We can use the remote to access download movies, MovieLink on the e-PC and then watch them anywhere in their home, just transmitting them around the house in a wireless fashion.

All right, we've seen Spiderman.

We've got another DMA, DMA from Mediabolic. This is an interesting one and what it does is, in fact, runs applications from your entertainment PC and an entertainment PC is a real PC. What it will do is just transport those applications onto the screen. So what we can do is we can be watching a program but we can also have the PC project its application and interrupt us if something is happening.

And one of the things that's happening is I like eBay, I like fly fishing, I like to buy fishing rods on eBay. I put my bids in and I want to know if someone trumps my bid. I can have an automatic alert set up that I've been outbid so I can go off and rebid if I want. But again it's just that PC application transported or moved onto my CE device.

I can respond or dismiss that, we can have other types of alerts. If somebody rings the doorbell, I have a home PC security system. (Laughter.) Who's there? The pizza guy is there. I will not dismiss the pizza guy, I will go to the door, but again that home security system is an app running on my PC but now being transported, remoted onto my TV.

Lots of aspects to this, DMAs standalone, built-in, lots of capability coming in the future.

Intel is working with Hollywood, the content creation people, the CE industry, the computer industry and other people on the digital rights aspect of this kind of capability. You heard Gary talk a little bit about that upfront. It's really important to make sure that the individual users have access to content and can time shift, space shift, that content legally, of course, so that it can be displayed anywhere, anytime, in any capability they have in their home, digital home environment.

There's a lot of other exciting innovation coming out, wireless ways to make your CE devices work better. If I go back to my Montana experience for a moment, I have three great racks of electronic devices. It's beautiful in the front, you can't see a wire. You walk around in the back and it looks like I'm a copper company, there's wires and cables everywhere.

Plug and play, which is really the simplest process we've been working on for several years in the consumer electronics industry, it's the way you download your digital cameras, your digital videocams and all that capability to your PC today, the standard uses a universal serial bus wired connection.

The next trend here is really to remove those wires, to remove those wired connections, to be able to take your CE device, whatever it is, a video cam for example, and put it right next to your PC, do a wireless broadband download, replace that USB wired connection with a USB wireless connection, a 1394 wireless connection using Ultra Wideband capability. Ultra Wideband is a great short range wireless capability up to 480 megabits per second, transfer capability of two feet, falls off a little bit about ten feet but you still get 100 meg or so at ten feet.

So that capability comes in something this size today, a piece of silicon the size of a dime, ten million transistors. We have the capability today to put 2 billion transistors down in the microprocessor. Will this be integrated into the standard silicon in all of these devices in the near future? Absolutely. What you want to do is put all those different protocols that we use for short range wireless communications capability on a common radio, all the protocols immediately acknowledged and accepted by the CE device, by the computer device, and we can download hundreds of megabits per second easily, quickly, anywhere at anytime.

I think that sort of capability will continue to make it easier for the consumer to use these devices and to move rich content from CE devices to the PC and then from the PC to anywhere in the digital home.

Now, when you think of PCs, one of the things you think of is games and you think of very high performance microprocessors, processors running at very high clock speeds, lots of onboard cache, great video characteristics. We think in the future of dual-core, multi-core, multi-threaded capability. And what this does is gives the gamers great capability.

And what we want to do is look just for a moment at what's happening in this industry and how the gamers are using the power of the PC in the home, and this is really part of the digital home, gaming is an integral part of that, to bring a new level of excitement to themselves and to other users as well.

And the PC game makers have been having lots of fun. We're giving them more transistors, more processing power to play with today than ever before. Let’s have Jay Cohen who's a VP of publishing at Ubisoft, come out and tell us a little bit about this company and how they're going to use this processing capability.

CRAIG BARRETT: Hi, Jay. Welcome. Tell us a little bit about Ubisoft, where they're located, what they do.

JAY COHEN: All right, Ubisoft, we're a global entertainment software developer and publisher headquartered in France. We've got development and publishing facilities in 21 countries, employing about 2,500 people.

Currently Ubisoft is one of the fastest growing publishers in North America. Some of our best selling titles that are coming out of the studios are things like Tom Clancy's Splinter Cell, Ghost Recon, Rainbow Six, as well as other franchises like Myst, Rainman, CSI and, of course, Prince of Persia.

CRAIG BARRETT: These are all the things my grandkids play with?

JAY COHEN: All the time.

Recently we partnered with Intel to optimize one of our best-selling games, Prince of Persia Warrior Within, to be optimized for hyper-threading technology and specifically developed and optimized for the ten-foot user interface on the entertainment PC.

CRAIG BARRETT: Why is the ten-foot UI important in this case?

JAY COHEN: Well, what's great about the 10-foot UI is it finally gets the gamer away from the two-foot desktop set up in the corner in the bedroom out into the living room.

CRAIG BARRETT: So when the pizza guy brings the pizza, you can sit there and put the pizza on the table, still have the game playing on the big screen in the background?

JAY COHEN: Absolutely. So now you can get in front of the big wide-screen, high-definition display, get the true cinematic experience, get the big-time surround sound that you're looking for, and really experience the immersion and realism that the games were intended to be.

CRAIG BARRETT: Okay, I was telling the audience a little bit before about this dual-core processor, dual-core, multi-threaded processor capability coming down the stream. Are you guys going to use that?

JAY COHEN: Absolutely. As you can see right now, we're just scratching the surface of superb, dazzling graphics that dual-core is going to enable us to have the most realistic and richly detailed facial animations in the character, very life-like artificial intelligence, take advantage of DVD-quality like audio, and of course the high-definition displays in the living room.

CRAIG BARRETT: Great. We look forward to working with you, and my grandkids really look forward to it. Thank you very much. Thanks, Jay. (Applause.)

Music is obviously one of the key aspects to the digital home. And when we think of MP3 players, we think of Napster, we think of all the peer-to-peer file sharing, we think of the current commercial offerings, Apple's iTunes, Microsoft with their offerings, other people trying to bring commercialization of music offerings onto the Internet, subscription-based capability, you start to get really excited about it.

And it's really the digital nature of the Internet, the digital nature of music and entertainment that allows all this to happen.

And that digital nature also is exciting, because it allows anyone to play. If you can separate the digital tracks in music, the bass from the guitar or from the vocals, from whatever, the drums, whatever, you can participate as you play. And this would allow you or me or anyone perhaps to be the next big rock star. And there's really a great application that was released this last summer in this area in this space, and it's transforming the music experience, especially if you're into music and into music creation and into the interaction with music.

So what I'd like to do is welcome out two young musicians who are behind this software effort, UmixIt -- Marissa and James DeVito, have them come out, tell us a little bit about the software and demonstrate how it works.

MARISSA DEVITO: Hi. Well, the idea for UmixIt really game along with me and James, we're both musicians and have been involved in music our whole life. And one day James wanted to learn a bass part to a particular song and realized that it obviously would be easier for him to learn it if he could hear it by itself. And so our father is in the music industry and we have both been to the recording studio with him, so we know that when music is recorded, each instrument is recorded by itself, so when it's mixed you can hear it by itself. So we thought wouldn't it be great if consumers could share the studio experience with their favorite artist just like that? So that's really how the idea came up.

CRAIG BARRETT: And your dad helped you out a little bit in this?

MARISSA DEVITO: Yes, definitely.

CRAIG BARRETT: Yeah, dads have a way of doing that, don't they?

MARISSA DEVITO: It's actually available on the new Aerosmith DVD. It's the title track, "You've Gotta Move," and the software and music is included together.

CRAIG BARRETT: So it's kind of a little bit like a karaoke deal, but you can split all of the tracks on the DVD and pick out any one or replace anyone?

MARISSA DEVITO: Yup.

CRAIG BARRETT: Sounds fantastic.

MARISSA DEVITO: The other interesting thing you can do is you can hear what kind of tricks the original recording engineer used on the tracks, such as they use a device called the squawk box on Joe Perry's vocals.

The other cool thing is you can actually mute the vocals and read along and sing with the words that are on there.

CRAIG BARRETT: So you can just have all the other tracks playing, the instruments in the background, and you could become the vocalist?

MARISSA DEVITO: Yup.

CRAIG BARRETT: Fat chance. (Laughter.)

MARISSA DEVITO: You want to give it a try?

CRAIG BARRETT: Never in the history of mankind has anyone sung worse than this guy here -- (laughter) -- no way.

MARISSA DEVITO: Well, that's okay. We actually brought along one of our friends who has done this before.

CRAIG BARRETT: All right. Well, I'm waiting. Let's see what happens.

STEVEN TYLER: Yeah, well maybe I can help. (Singing.)

CRAIG BARRETT: There's more to it than that. (Laughter.) Steven, thank you for joining us today.

STEVEN TYLER: Thank you very much.

CRAIG BARRETT: Two grandfathers on the stage here, right?

STEVEN TYLER: Oh, man.

CRAIG BARRETT: How does it feel? (Applause.)

STEVEN TYLER: It feels real good.

CRAIG BARRETT: So how did you get tied up with these two youngsters over here?

STEVEN TYLER: Well, I met them at a recording studio in New York and they were talking about this project that they had in their head. And I remember in the old days when we were doing Toys in the Attic and Rocks there was always a conversation like, you know, "Maybe Paul is the walrus!" (Laughter.)

But along with that conversation there was another conversation about, like, "Look at that board and listen to what Joe Perry played when the song was over." And, my God, if anyone knew what the real base line to "Sweet Emotion" was, because of all the edits and the stops and all that, and I thought, well, how great would that be if people could hear this. And of course back then the technology wasn't there. You'd have to have a 24-track, multi-track studio, and oxide tape and so it just wasn't usable or doable. And now of course you can do this.

And these guys said that they had the software and they could do it. And I said, "Oh yeah? Show me." And so they did it. They got it. And you'll never know what slips and what lives between the tracks until you listen to an Aerosmith song and you hear what breathes and what's at the end.

And if those that do it right do it right, they won't edit out too much of the stuff, so you can hear the grunting and the, "Shh, don't flush the toilet." (Laughter.)

And if you have this at home, it's like you've got a recording studio in your home. It's right there in your little laptop. And you know if the Dominoes guy comes, you don't have to tip him, you can let him play cowbells. (Laughter, applause.)

CRAIG BARRETT: So, your latest DVD has got the capability, right?

STEVEN TYLER: Yeah. We put out a DVD called "You've Gotta Move," and that's the only track that wasn't on the DVD. So I said to Sony, We've got to do something about this. And at that time they told me about this technology, and I said, "Man, if we can just hold it up for a week" and Sony went, "No, no."

But we did. We held it up for a week, and we were able to do it and we got eight tracks and 16 that you can play with and do what you want. You can take Joe's guitar off and put your on or take my vocals off or do whatever you want. You can do whatever you want, it's just so great to listen to the drums without the bass and then mix it yourself, you mix it in such a way where you get to see the genius that lives in a producer's mix. You get to live it and breathe it. (Applause.)

CRAIG BARRETT: One last question. You've got any advice, there's probably some budding rock stars out in the audience. Do you have any advice for them?

STEVEN TYLER: Make sure you have two lawyers. (Laughter.) One watching the other. (Laughter.) And just make sure you've got back pockets full of passion and you just believe in yourself so much and don't let anybody let you down or take you down or get you done, and just go for your dream. Look what they did. (Applause.) See ya.

CRAIG BARRETT: All right. Well, Marissa, James, Steven, thank you for joining us today.

STEVEN TYLER: Thank you.

CRAIG BARRETT: You know, the digital home is really a lifestyle and it shouldn't be confined to just the home. It ought to be able to follow you anywhere. And mobile computers are one of the ways we're finding to do that. They let you get out of the home with wireless capabilities and Centrino mobile technology; laptops built on our technology are a good example of that. In fact, the UmixIt demo that we just did was done on the next generation CMT laptops, code-named Sonoma, that'll be for sale here in the United States later this month, next generation microprocessor, next generation chipset, great audio, video capabilities and next generation wireless capabilities.

So increasingly these laptops are helping us with our lifestyle, with our digital lifestyles, providing features for use on the go, wide screen, TV tuners, personal video recorder capability, remote control, examples of all that good stuff.

In fact, if you look at what happened with laptop computers this last holiday season, notebooks are one of the biggest sellers in the marketplace and I think the early consumer sales out figures suggest that notebook sales this holiday season exceeded television sales, if you can imagine that, so not just do computers outsell TVs overall but notebooks now are outselling TVs. Shipments were up about 25 percent over last year. Part of that popularity is obviously driven by

broadband wireless connectivity, the so-called Wi-Fi capability which gives you 10 to 50 megabits per second within about a 100-meter radius of an access point. And there are now over 50,000 verified hot spots that work with Centrino-based laptop computers.

But there are lots and lots of different types of laptops that we have. And in fact we have a few of them over here that Diane is going to show you, different types of mobile devices. The first we're going to show you is a wide screen from Dell, with big, massive, screen, full-feature capability. This is the sort of laptop PC you buy in the United States if you've got an SUV or pick-up truck. (Laughter.) I'm not saying anything demeaning about the weight, but this is a full-feature device -- big screen for best-viewing capabilities.

The one next to it is actually a European laptop, medium. We know the Europeans drive smaller cars, so they need smaller laptops. (Laughter.)

The one in the front is a Samsung notebook, and this is in fact a full-featured notebook. It can do any app, has great battery life, great computing power, and great capability. In fact, that Samsung laptop is probably no bigger than some of the first PDA devices when they came out a few years ago. All three of those devices are full-function laptops.

One of the interesting things about laptops is in fact the issue of males and females and their likes and dislikes. And one of the interesting things about electronic devices and consumer electronic devices is, surprisingly enough, females spend more money than males do in this area. And it's us guys who have been designing them for us guys for the longest period of time. And women are buying them. So we've done some studies and commissioned other studies in this area to find out what turns females on. (Laughter.) What does this technologically inclined female want in a device? And we did a technology and lifestyle survey among women, and you're starting to see pink laptops come out now, designer carrying cases for laptops. The real issue here though is that women are as involved in the technology as men. In fact, in the last survey we did, 50 percent of the women were more likely to want a laptop, and only about 43 percent of the males wanted a laptop over a desktop. And women preferred wireless -- 39 percent to about 30 percent. So women are in this game in a big way, and we have to account of that in the design of the technology, the creation of the technology going forward.

You know, there are really three screens in life that are important. There's a big-screen TV; the interactive screen which is the PC, desktop or laptop; and then the small hand-held screen which is very useful for instant-messaging, phone calls, watching short video clips. It's not something you'd type a manuscript on. Let's just take a look at some of these.

The first one is a Treo 650. This has an Intel mobile processor. The next one is the Dell Axim. That has an XScale Intel processor, VGA displays great for video and games, played in the hand-held way. Next is an iMATE, which is a PDA phone with sliding keyboard, blue-tooth, Wi-Fi, digital video camera in it. And with Asia as the biggest market for hand-held devices and China being the biggest market for cellular phones in the world -- we've got a Mote 680 phone which is based on an Intel mobile media processor, great battery life, great system, SpeedStep smart technology.

But the interesting thing is about these hand-held devices, is they do a lot more than just talk or a lot more than just access information. They can have voice-recognition capability, they can have handwriting capability, they can have MP3 players in them and wireless communication capabilities, so you can take them in your car, download music off your hand-held device into

your car stereo system. These are great examples of consumer electronic devices all the way from the compute space down to the hand-held space.

If you look at what's going on in the world -- and I mentioned China is the largest cell phone market -- but China is also the second largest computer market in the world today. But wherever you go in the world -- and I visit about 30 countries each year, doing business for Intel -- you see exactly the same sort of technology, tailored to fit the local societal, cultural aspects, but built on the same standard modular building blocks. And I think perhaps the most interesting thing is how fast it has expanded in the last decade. You know, we've added India, we've added China, we've added Russia and Eastern Europe. We've added the Middle East. We've added much of Latin America. About three billion people have joined the world's marketplace. They're all consumers of this technology. They all have aspirations to use the technology. So it's exciting to visit these places and to see how all this is happening, how people recognize that computers, communication equipment, consumer electronic devices can upgrade their lives.

If we look at how it's being used, there are some very exciting ways people are using technology. In China for example cell phones are in such great use, you can go to department stores and other public places and they have cell phone battery charges there for you to use free of charge. If you go to Malaysia -- Malaysia happens to be a Muslim country where the people there pray several times a day. In the Muslim faith you face Mecca when you pray. Hand-held devices in Malaysia have a GPS system pointing the way to Mecca to pray.

In the Middle East, where power is important, and you don't want to have your computer on all the time, you can get messages to your hand-held device telling you that you have e-mail so that you can turn your computer on, or go to a Internet cafe for access. And the proliferation of Internet cafes is quite amazing, if you go to the developing countries. It's not really necessary to own the technology in order to use the technology. You just have to have access to it. And what I find is very interesting, there's a whole generation of people going to Internet cafes, using the Internet, proficient at e-mail, proficient at web-based applications, who don't know how to turn a PC on. They're always on in Internet cafes. They don't know where the on-off button is. They just know how to use the technology.

Now, in Asia one of the most interesting aspects of the use of technology is for education. And if you question people in China about why did you buy a PC, typically it's, "We bought a PC to help educate our children, to help them get ahead." And so the whole issue of creating user-friendly PCs in China is very important.

What Founder, the number two Chinese-based PC company, has done, is create a PC that is family-friendly. That PC has a special key on it. You turn it to the left, it's a full-function PC. You turn it to the right, it's a child PC with restricted access. So it provides a child with a safe, fun, easy learning experience.

The great concept, great utility, we've got a young student here, Angela, who is going to come out and show us how to use this capability.

CRAIG BARRETT: Okay, let's go do it, all right? This is a PC from Founder, and it's got a stylus, because we're going to do education things on it. And one of the things we're going to do is practice writing our Chinese characters, right? Can you do that for us? Okay. What character is that, by the way?

ANGELA: Cloud.

CRAIG BARRETT: It means "cloud." Okay, all right. So you're going to trace on there, right, with your pen? And the PC is smart enough, when Angela traces that character the PC is going to grade Angela. What sort of grade did we get on this one?

ANGELA: Eighty-eight.

CRAIG BARRETT: How much? Eighty-eight? That's pretty good. What else can we do with this PC? Can you do some math games with this one?

ANGELA: Yes.

CRAIG BARRETT: All right. I'm glad you can read that stuff. (Laughter.) The math games she's going to do, is we're going to look at a three-dimensional figure, and then what we have to do -- so the cone is the three-dimensional figure. We have to figure out what of the two-dimensional representations actually would create that three-dimensional figure. So you can do a couple of these. Did you pick the right one there? All right. Can we do another one? Come on, Angela, you've got to make a decision here. (Laughter.) I guess the PC grades you in this respect as well, doesn't it? You make a mistake, it tells you about it -- right? Is that what your parents do too? So what else can you -- can you do anything else with this PC for us?

ANGELA: No.

CRAIG BARRETT: No? (Laughter.) Okay. Well, we want to thank you for coming out and joining us today, Angela. All right? Angela, by the way, is the 8-year-old daughter of one of our engineers at Intel who, very proud father who is here watching his daughter up on the stage today. Thanks a lot, Angela. (Applause.)

That is the Founder PC and I also wanted to point out that this is a Chinese designed notebook specifically designed for Chinese high school, college students, basically designed and built in the PRC for mobile sharing, study, play, all of the normal characteristics that you'd expect out of a university student, but basically designed in this instance specifically for an advanced student, in this case the Founder PC designed for the young student where you want limited access capability.

You know, there are other aspects of the digital lifestyle, education is one, but when I start to think about my retirement coming up in six months or so from Intel and the fact that I'm 65 now and that there are 600 million or so people over the age of 60 in the world and many of us suffer from senior moments, many of us can't remember our lines, can't remember friends, faces, what we're supposed to do each day, it's possible for the technology to do a lot to help us out in this area as well, to enable people to still live alone with dignity and respect but also to help them monitor their activities, help them live a useful lifestyle.

And the same notebook that we're able to run the UmixIt application with Aerosmith and Steven Tyler and gang with, that same sort of notebook can also be used to help seniors monitor their lifestyle on a daily basis.

I want to bring out Eric Dishman, who is an Intel employee who works in the healthcare and health sciences aspect of Intel. Eric, welcome. Why don't you tell the audience a little bit about

some of the work you've been doing with seniors and healthcare and the application of technology to that?

ERIC DISHMAN: Well, as you know, I'm one of those weird Intel social scientists who goes out and spends my life studying, observing and living with hundreds of households each year around the world. We did some research back in 1999 and 2000 on digital entertainment and the digital home and a lot of families said to us, yes, give me more content, give me more television but they also told us help me take care of my aging parent.

So when we came back to Intel and started looking at worldwide demographics and said, oh my gosh, there are 600 million people over the age of 60 today in the world and those numbers are going to double to 1.2 billion over the next 15 years, we need to start thinking about how the digital home and the digital lifestyle can help with health and wellness and other kinds of usage models.

CRAIG BARRETT: Well, you've got a couple of ideas for us?

ERIC DISHMAN: Well, we've been doing a lot of research around this space. We've got systems back in the labs in Oregon that can have medication reminders track you around the house and maybe Steven Tyler's voice saying "walk this way" to take your pills. (Laughter.)

What I brought for you today are two examples for right now. We've been spending the last year studying people with cognitive decline. A lot of these folks have memory problems, 100 million people today have difficulties with memory, maybe not full blown Alzheimer's but challenges just knowing who have they talked to, who are their friends, who stopped by and they become very socially isolated and a lot of times this means if they do have something like Alzheimer's their disease actually progresses more quickly because they're not able to do everyday tasks that you and I take for granted.

So what I brought with me today are two of the systems that we're testing right now. We're partnering with the University of Nevada Las Vegas and the Jewish Federation of Las Vegas to test in six households of seniors and caregivers today what we call a social health system.

Now, if you look at this, this is basically a representation of what a number of sensors around the house, these little, tiny sensors that we've placed around the house, along with a lot of the digital home technologies that people in this room are building, and it's really trying to figure out how much social time have we had, e-mail time, phone time, have people come over to visit, and this is a representation that the senior uses, that the family uses. You can scroll over the different dots here. Think of this as your mom at the center of her solar system or the mom at the center of the universe. And these are different people, there I am interacting with that person.

And this dynamically updates based on the sensor data and the usage of the telephone and other kinds of things going on in the home.

This is useful for the caregivers because a lot of them, they all think, oh, my other brothers and sisters called mom and it ends up that five days have gone by and no one has checked in. And it's useful for the seniors themselves who have memory loss because they literally practice these are the names and faces of friends that I've talked to.

CRAIG BARRETT: That's fantastic. Now, you can do this in various styles or representations?

ERIC DISHMAN: Right. A lot of people don't like this big, complicated solar system view so you can actually click on a line graph view. One of the women in our study calls this the inheritance detection system and she can figure out who's the good son and who's the bad son. (Laughter.)

CRAIG BARRETT: This is likely to be widespread technology I think. (Laughter.)

ERIC DISHMAN: Some people just like a simple text summary and the system actually will just show them, you know, you were a little bit more socially active yesterday than you were last week, because again these people can't remember who they talked to yesterday and they have no sense if they're declining or they're getting better.

And this kind of data that we're using we're also using with some of the top Alzheimer's researchers in the world. It's not just about trying to help these people stay in their own homes but we believe that we can actually detect the disease possibly ten years earlier than we can now by collecting this kind of data and looking at someone's personal trend over time.

CRAIG BARRETT: And what was the second part of this study that you did?

ERIC DISHMAN: Well, so the second part of this I brought is I'm going to show you actually a diagram of one of the homes. If you think about what's under the hood here, the seniors and the caregivers don't actually use this but what you're seeing here is the layout of the home, and it's a range of motion sensors and sensors placed in the bed and it can even actually look at your heart rate while you're lying in bed.

And what I'm going to do is I'm going to call Terry, one of the test subjects in our house, and what you'll see is the phone on the hook as I call Terry, four rings, which actually I can't see from this far away so I have to call Terry. And Terry actually I can tell because of the chair icon and the TV icon, it looks like he's probably sitting and watching TV. You see here the phone is starting to ring. And that's the caller ID that shows up for Terry saying who is this person who called, it's me in this case, and when we last talked and actually what we spoke about. So this is really important because a lot of these folks again don't know any difference between their neighbor and a stranger who's come by and they certainly don't remember what they talked about the last time that they had a conversation with this person.

I'm not sure why Terry's not answering. He probably knows that 3,000 people are waiting and watching.

CRAIG BARRETT: I think Terry is probably listening to the latest Aerosmith DVD and probably putting the audio track in.

ERIC DISHMAN: So Terry can get this kind of information at his house and, again, we want to try to keep the person social and staying in their own home for as long as possible and also use this kind of data to give us a new window on diseases like Alzheimer's and help catch them a decade earlier.

CRAIG BARRETT: The basic goal of all this is to improve quality of life and using the technology to make that happen.

ERIC DISHMAN: Exactly right. It's a great way to punch the clock at Intel for me.

CRAIG BARRETT: You know, that's part of the digital lifestyle and let's just expand it a little bit now and go to a larger scope and really look at what's happening under the digital skies and how do we get broadband capability expressed out farther, greater reach, greater capability.

And consumers are increasingly wanting broadband capability, the ecosystem really has to provide that capability to match. In the past we've obviously had broadband capability in terrestrial transmission, satellite transmission but there's a new type of ecosystem that's coming into place and that's broadband wireless capability, which replaces fiber, replaces copper, replaces cable, can replace all sorts of things, won't necessarily replace them, can be competition, can be complementary with those things.

But building this sort of citywide or metropolitan wide capability really requires a lot of activity from a lot of different folks, industry, government working in cooperation, governments are important because they can control spectrum allocations, things of that sort. So the collaboration between government and industry I think is very important to give the bandwidth capability to go with this electronic, compute, CE capability that we're talking about.

Actually, if you look at some of the capabilities around the world it's very interesting, lots of cities around the world are going into WiMAX type applications, that sort of capability, and that's just a fabric which is connecting communities, it's driving growth, efficiency, productivity and competitiveness of different places.

Let's just take a minute and look at a short video for several different cities around the globe and seeing how they're going digital.

(Video segment.)

CRAIG BARRETT: It's kind of interesting this whole issue of WiMAX, which is this broadband, wide range wireless technology that runs up to perhaps 40, 50 kilometers, 40, 50 miles with 100 megabit or so capability, has the opportunity to make digital cities where none existed before and, in fact, if you look at a city like Las Vegas or like this convention center, this auditorium that we're in today and we look at what a Wi-Fi capability transmit path of perhaps 100 meters maximum would look like and then compare that to a WiMAX capability for the city of Las Vegas, you see some very interesting opportunities.

And what we want to do is just show you a little bit of a WiMAX animation here. What we're going to do is we'll start the video and we're going to look at Las Vegas, fly down to the Hilton Hotel where we are today, show what the range of wireless application looks like for Wi-Fi and then we'll back off a little bit and see what that range looks like for WiMAX. So let's start that video, if we can roll that, please.

Now, WiMAX, which is Wi-Fi's big brother, which is 40 or 50 kilometer capability, let's just back off and look at Las Vegas, continue to back off and we'll just do a 50 kilometer radius circle around there and you can see what the capability is to turn Las Vegas into a digital city with a WiMAXed broadband wireless implementation.

There are 40 or 50 of these city experiments, metropolitan area experiments going on around the world today using WiMAX technology. Again, it's not necessarily competitive with cable or high school DSL, it is good quality broadband though and it's very inexpensive to put in. The consumer premise is equipment, the radio that you need to be at the receive end of this is probably in volume going to be only $100 or $200 maximum in the next year or so as the technology rolls out.

So great capability, really a transition again that requires both government and industry and commercial applications to make it fly.

The home is interesting and all the stuff we've talked about today is interesting but you know what it really implies as we go through this is we're going to upgrade our life and we'll probably also then upgrade some of the equipment in our life. And it really sounds nice but you have to then start to worry about what you do as you upgrade all that electronic equipment in your house, what do you do with the hold monitors, the old computers, the old speakers. Well, I do think we have someone from eBay here. Meg, why don't you come out and join us, Meg Whitman, CEO of eBay? (Applause.)

MEG WHITMAN: Thank you very much, delighted to be here.

CRAIG BARRETT: Meg is here today to make an important announcement. We're going to have a formal announcement after this session but I wanted Meg to come out and just tell us a little bit about it. eBay is driving it, Intel, several other companies are playing along with it.

MEG WHITMAN: Well, we've sort of fallen by the notion that eBay is an incredible venue for not only new computers and new electronics but also used equipment. In fact, one of the very first items that was sold on eBay was our founder, Pierre Omidyar's broken laser pointer pen. And he put it up on the site, described it as broken and it sold for $14 and he had paid $21. And he said, "You know what, this might be a pretty good idea."

So basically this combined with our thinking about e-waste, which is really a big problem for our industry. Estimates are by the EPA that 2 million tons of e-waste every year is generated and only less than 10 percent is recycled, so that's what we were thinking about in terms of this whole initiative.

CRAIG BARRETT: It's clearly a big problem. We do some recycling, we have a program that students recycle computers and refurbish them and donate them and we do something over 300 tons a year, but it's a huge problem and I think eBay has the reach and the breadth to really help solve that, education wise, selling it if it's possible to sell it. I didn't know I could sell broken stuff on eBay, I'll remember that. (Laughter.) I mean, I wish we could sell at Intel broken microprocessors and things like that to our customers. (Laughter.) I've got to figure out how you do that. But it looks like a very great program and I think that something that industry can work with governments and everybody can benefit, we can get rid of toxic waste, we can recycle and we can put people to work in the process as well.

MEG WHITMAN: Exactly. I mean, we knew we could not do this alone so we needed to try to be a catalyst for an industry coalition and we're very grateful for Intel's support. But by bringing together industry and government as well as eBay's community of users, we thought we

might be able to create something that over time could build momentum and really solve a problem for this industry.

So we're really excited about it and we're looking forward to our press conference a little later on this morning.

CRAIG BARRETT: All right, well, I'll join you for that. Great, thanks, Meg.

You know, when I was in Lima, Peru a couple months ago I was looking at an interesting application for computers. Sofia Milanovich, who's a young Peruvian girl, is the world champion surfer and Sofia has this great surfboard. It has a Tablet PC built into it, wireless connection, so she can go out there and while she's waiting for the big wave she can sit on her surfboard and do e-mail, "surf" the next, excuse the pun and so forth.

And I was thinking about getting Sofia to come out and do that demo here but we're quite a ways away from the ocean. But there is a lot of flatland around Las Vegas in the desert. So I thought what I would do is I would ask a friend to kind of do a similar thing but on a bicycle, so I asked him to go out for a ride and then to come back to report to us here and see what the future holds in terms of what on-the-go communication, on-the-go PCs look like in the future and what happens. And he ought to be here any moment, he should have dropped in by now. Ah.

DEMO PERSON: Sorry, Craig.

CRAIG BARRETT: Where have you been, man?

DEMO PERSON: I was out there catching some air across the way.

CRAIG BARRETT: And what is this on the front of your bike?

DEMO PERSON: This is my graphical electronic entertainment console. I like to call it "GEEC".

CRAIG BARRETT: GEEC? You know, I don't know if you could ride that bike in California. I don't know if Schwarzenegger allows that sort of stuff. I mean, could you really ride your bike and work your PC at the same time?

DEMO PERSON: Well, it's kind of hard when you're watching movies but for the most part it helps tell me where I'm going because I never get lost at least. In fact, I know you actually like entertainment devices and computing devices so much, so I thought I'd bring you one of your very own that you could play with and maybe when you're out fishing and not catching anything you can kick back.

CRAIG BARRETT: It's a fully functional PC running Windows XP Media Center Edition, touch screen, wireless LAN, Bluetooth, GPS, videocam. I can watch DVDs, synch to my entertainment PC at home, content, Wi-Fi hotspots, download capability, download content, surf the Web, video chat, ride the bike. Can it catch the fish yet?

DEMO PERSON: I couldn't have said it better myself.

CRAIG BARRETT: I am a fly fisherman. Excuse me, I just want to watch this movie for a few minutes, A River Runs Through It. It's on the Blackfoot River just north of Missoula, my ranch is just south of Missoula. It's great fishing there.

That's cool. What else have you got in that pack?

DEMO PERSON: Well, I figured if you wanted to play some Prince of Persia while you're out and about, maybe you might want a unit that's a little bit more geared towards gaming.

CRAIG BARRETT: Same capability but gamer built in, right, buttons, mini joysticks, all that good stuff? How much does it cost?

MR.: I don't know; this is a concept prototype platform at this point.

CRAIG BARRETT: It's probably on eBay by now. (Laughter.) All right, back to the desert.

MR.: All right, I'm on the go again. Thanks, Craig. (Applause.)

CRAIG BARRETT: You know, I want to finish up with one other guest. The movie we were watching, A River Runs Through It was directed by Robert Redford and Robert Redford also runs the Sundance Institute, which is an institute for independent filmmakers. And it seems to me that there's a lot of similarity, a lot of commonality between what we're talking about here today and what Sundance does. The digital home, all this new electronic gadgetry really allows the individual to contribute, the individual with an idea to do something and that's really the concept behind Sundance.

And so I thought perhaps a fitting way to end up today's discussion on consumer electronics, computers, convergence of computing and communication would be to have Robert Redford come out and join us. Bob? (Applause.)

ROBERT REDFORD: Hi, Craig. Hello. What a thing to compete with.

CRAIG BARRETT: Did you like that show we had up front?

ROBERT REDFORD: Yeah, I did. Do these people know that I'm brought out here to be the Luddite in this convention?

CRAIG BARRETT: No, I don't think that's the case.

ROBERT REDFORD: No, it's not.

CRAIG BARRETT: We want you to come out and tell us what technology means to people like you, to organizations like Sundance, the independent filmmaker, what's it allow them to do, what sort of creativity does it give them?

ROBERT REDFORD: Well, it's a lot and it's pretty timely because right now, as everybody knows, we're in a real sea shift of change and it's essentially being driven by the new technologies. So there's my interest in it, which is basically reflected in Sundance, but Sundance is -- I mean, first of all, we're all in the communications business, which is after all storytelling,

which is my business, but we're in it together and I'm content and you're delivery, and so what you have there is the possibility for collaboration.

And the collaboration has already brought incredible new opportunities. I mean, for example, we have a whole new industry has been created by the coordination between new technology and artists. We even have computer graphics with special effects, you have animation; I mean, those are now industries almost unto themselves that came as a result of artists having new opportunities given to them by the new technologies.

So that's where Sundance comes in. I mean, Sundance obviously, as I am, I'm about storytelling and content and technology is not to be an end unto itself, it's a means to an end. So we're together on that; we can't create products and have it stay in the closet.

So it's all about what you can do with and for us and what we can do for you.

CRAIG BARRETT: It seems that some of this broadband delivery capability, which can be very localized, has a perfect match with the independent producer, the small producer, the tailored presentation, the tailored content creation and then the tailored delivery of that.

ROBERT REDFORD: Yeah, that's right. I mean, look, it's all tied to one of the great -- for me one of the great benefits and pluses is what it's done for the democratization of films. I mean, the fact is now that we have access to more tools that you have created and therefore to each other. I mean, we now have more access to one another in the democratization of film that has been brought and has been brought by the new technology. So now the artist is going to be freer and have more protections in terms of their own individual voices, and Sundance basically is an organization, a nonprofit organization that supports the ability of new artists to have a place to work and to be free of restrictions, so risks won't be considered a failure, it will be considered a sign of growth.

So we're very excited. We have at Sundance the festival is coming up here in a couple of weeks and it's sad for me because I like to go and just see the movies but I get caught up in having to meet a lot of people and so forth. But we have a digital center there that demonstrates that Intel is very much a part of, where we demonstrate the new technologies as they come online and then we also use our products to demonstrate what that new technology can do. So we're pretty excited about the new technology.

CRAIG BARRETT: I think, in fact, you have your demonstration.

ROBERT REDFORD: We'll meet at Sundance.

CRAIG BARRETT: Good but I think you're going to have a demonstration this year of a digital movie broadcast off the server in Oregon to Park City, then sent up to a remote ski resort with no other broadband connection.

ROBERT REDFORD: This year we're going to be going into different locations over about a 50 mile track. So you're seeing incredible advances. And, of course, for the filmmaker I mean this is a joy.

But, you know, I have to say one thing. With all that, I think that any new technology has to be looked at from both sides. You have incredible pluses that are coming, you have the stuff and

say, okay, now what do we have to be cautioned about. And for me, since I'm about protecting the voice of the artist and the freedom of expression, that's very much what Sundance is about, which is very democratic in itself, so far so good, but as we move through and we have this incredible rush of information that's coming so fast and furious, that it's coming from so many sides you wonder when you're going to have time to digest and process the information you're getting and, in fact, a lot of the information that's coming and a lot of the content that's coming has really got some great stuff.

And so where Sundance comes in is in trying to almost create an oasis or a pause. As we deliver our product to the populace, we try to do it in a way that has with it the ability to process the information and the content that you're getting. And so for me, for example, on a personal living, I mean, I think a great thing about my industry is that it's so broad, it can accommodate so many things, but for me I like films that touch emotions on a human scale, that kind of storytelling has always been my favorite, and I would want to see that protected and preserved.

So Sundance is committed to that kind of storytelling and the new technology can be used so beautifully that we want to manage it. We also want to protect the artists like intellectual property rights and what you did before.

So it's an exciting new time and I think Sundance wants to be right there and ride the wave with it.

CRAIG BARRETT: One last question I need your help on.

ROBERT REDFORD: Uh-oh, don't tell me.

CRAIG BARRETT: No, it's --

ROBERT REDFORD: How old am I? (Laughter.)

CRAIG BARRETT: No. No, no, no. That big Rainbow Trout that Brad Pitt hooks in A River Runs Through It --

ROBERT REDFORD: Ferdinand.

CRAIG BARRETT: Ferdinand was his name, yeah, that was the mechanical trout, don't tell the audience it was a mechanical trout that he actually caught.

ROBERT REDFORD: New technology, there you have it.

CRAIG BARRETT: But, you know, I need a fishing lesson, I want to catch a fish that big in Montana. Can you help me out?

ROBERT REDFORD: I can and that doesn't require any new technology either; just come out to my place.

CRAIG BARRETT: All right, thanks. (Applause.)

Let me just leave you with the following message. I think that we're talking about technology that's going to help upgrade everybody's life, really bring enjoyment, bring excitement, bring us

new opportunities as Bob Redford was talking about of creating content, distributing content, doing things that we couldn't even imagine a few years ago.

We ought to be inspired by that, we ought to be inspired ourselves by that and we ought to imagine what we can collectively do in the future.

Make sure you drop by the Intel booth in the showroom this afternoon. Thank you for your time this morning. (Applause.)

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