

Web 2.0 Summit TV: Paul Otellini, Intel president and CEO

[Start of recorded material]

Paul: Good morning.

Interviewer: Good morning. It's been a better year, I think. Is that fair to say? I mean, it wasn't an easy year. We were here a year ago, and I felt like everybody was sort of in Chicken Little mode, running around going, "The world is falling apart." You were a bit concerned yourself. How do things feel now?

Paul: Well, we found bottom. Actually I think we found bottom much earlier than anyone thought we would. For our company, the bottom was in the February timeframe, so it wasn't much long after we were here a year ago. And we tend to be about three months ahead of sales out of machines when you look at the cycle.

If you look now at historically the PC run rate sales, they've come up since that point in time. We're likely to see PC unit volume this year above 2008, which you wouldn't have thought even three months ago.

Interviewer: Really? Uh-huh.

Paul: It's been a very strong second half. Good back-to-school. And it's not corporate spending; it's consumer, and it's China.

Interviewer: China. Can we focus on the U.S. and then maybe look at China?

Paul: Sure.

Interviewer: I was looking at some data, and maybe it was data that didn't include the last quarter, the back-to-school quarter. It said that both server and PC shipments were dipping in 2009 compared to 2008. Is that turning around?

Paul: Yeah. I don't know when that data was from, but clearly PCs will be flat to up a bit at this point in time, unless there's a collapse in the next 90 days, which I don't see.

Interviewer: Let's hope that doesn't happen.

Paul: Yeah. And server units are probably down a little bit. But I think a lot of what's happening is that the machines that are deploying this year are so much better than the machines they're replacing that there's a ratio that's kicking in of four or five to one, in some cases eight to one on the replacement. So people pulled the old ones off-line, put a new one in. It consumes less energy, smaller footprint, and the capacity and the performance is better. I think that is driving much of the server market.

But in general, corporate budgets are still clamped down. CFOs kept the lid on corporate America purchases for IT this year. I expect that to change in 2010.

Interviewer: You do? That was what I was going to ask next. If you expect that to change -- you would know better than almost anybody -- what gets a CFO to take the lid off spending? Because that is sort of at its core a huge driver of the economy that everyone in this room participates in.

Paul: Well, it's going to be business by business. But generally, I think that a trend toward a neutral deposit of GDP, which I see us doing, in general, the businesses will recover and be more productive than when they went into the cycle because of the downsizing that's going on. So we get some of that, so you get a rush of profitability. That tends to give confidence to CFOs to invest in things.

At the end of the day, IT is high on people's lists, because it's a tool of productivity. You look on the server side, we just talked about. On the PC side, the fleets are very old in corporations right now.

Interviewer: Do you measure how old they are?

Paul: Yeah. The average desktop is five years old.

Interviewer: Five years old?

Paul: And the average notebook is four years old today. Those have to be refreshed. They will not run Windows 7. They don't run modern security software in terms of the capability of the machines. They

can't do down-the-wire manageability and upgrading. I think we're set up for a scenario that says they have to be replaced, they're out of warranty, they cost more to keep per year than buying a new one. And CFOs buy that argument.

Interviewer: Let's pull back, because I'm curious. Back in the depths of things when folks like you were asked to make speeches to buck up your employees and everyone else who was feeling someone dismal, in Washington D.C. in February you gave a speech in which you said, "We have a once-in-a-lifetime opportunity to reshape how things will look and behave when growth resumes," which it seems like it is.

Do you think we took that opportunity? Have we done, to your mind, the things as a nation that we might have done to put us on a healthy road to recovery?

Paul: Well, I was talking about the stimulus package at the time, because it was just going through Congress. What I said at the time -- and I still believe -- is elements of that I think are quite good in terms of investing in our future. The health/IT initiatives, the broadband initiatives, the initiatives around doubling the funding in the National Institute of Health, the National Science Foundation -- those kinds of things are great.

I'm not terribly fond of some of the other things that the package went to in terms of swimming pools in Biloxi, Mississippi and all

the stuff we all read about. You compare that to, say, I think a very disciplined approach in China, where they spent about the same amount of money as we did in their package. It spends sooner, and they're focusing principally on infrastructure and on real-time stimulus associated with tax credits to encourage purchasing of appliances. And they included PCs in that.

So PCs, televisions, washing machines, et cetera, et cetera, changed their savings rate into a spending rate in China, which helped. And the infrastructure projects, like 25,000 kilometers of high-speed rail, are being built at a rapid rate. They're going to look back in five years and say they really did something with the money. I don't know that we're going to have the same feeling.

Interviewer: But China had a much higher savings rate to begin with, right?

Paul: They had a savings rate.

Interviewer: Right. [Laughs] All right, that's a fair response. We sort of swung as a country from having a negative savings rate to having a positive savings rate.

Paul: Right. But it's dropping real fast.

Interviewer: Yeah. So that's why I asked: Do you think we're set up for a healthy recovery, as opposed to one where we see profits. Let's take the financial services business as an example. Here's a business that

was on the brink of collapse, at least the major companies; has part of its stimulus or bailout package rather propped up. And then we see these extraordinary profits almost within three quarters. I know it's a bit out of your field, but do you think that was a good use of the money?

Paul: Well, it's way out of my field. But if you wind the clock back to late October, early November last year -- Lehman and Bear Stearns and stuff -- no one knew where the bottom was. And I think the global financial system was at high risk of a collapse, of a meltdown. And most people that were involved in that will tell you that.

You can argue whether we bailed out one company too many or spent one dollar too much. And it's easy to do Monday morning quarterbacking on this stuff. The net result is that our system did not melt down. We stabilized ours. We stabilized the world as a result of that, as everybody else came into it. And you look back and you say, "We dodged I think a very big bullet."

I would have liked to have seen some of the TARP money and the stimulus money that went to those companies structured in a way such that the taxpayer got paid back before anything else happened. That's probably something that should have been rectified, in my opinion, at the time.

Interviewer: Well, Austan Goolsbee is in charge of the recovery. He's Chief Economist for the recovery. He's going to be here, and we'll make

sure to press him on that. Let's go a little bit into your own business. You have invested \$7 billion in the United States infrastructure in manufacturing plants. We talked about this a bit last year, but these are decisions that you make over the course of many, many years, right? Can you tell us what it was that you've done recently here in the United States in terms of investing in manufacturing?

Paul: Where the money went? The \$7 billion went into four facilities, semiconductor factories in Oregon, Arizona and New Mexico. It's all focused on building 32-nanometer technology. Our most advanced silicon technology that'll last us the next couple of years is being deployed, and it's all here. That made sense.

To some extent, the lowering of demand allowed us to convert some factories, which is a cheaper way to get new capacity versus a greenfield expansion. To your other question, we'll make the decision on 22-nanometer probably six months from now, in terms of where we deploy those facilities and how many.

Interviewer: Is it just a hard-headed business decision? Do you look at rows and numbers in a spreadsheet when you make a decision about where you're going to put that kind of a plant? Because a plant like that creates a village. You can create that village in India, or in China, in the United States.

Paul: Singapore.

Interviewer: Singapore.

Paul: Yeah. Yes, we look at rows and numbers. In this round of the technology deployment, it made the most sense economically and time-to-market to do those in the United States. We could reuse facilities. We had a workforce in place. We didn't have to retrain people. They could just be spun up on the new technology. Didn't have to move people. So preserving jobs and getting to market fast was job one there.

If we're looking at a greenfield factory starting from scratch on a bare piece of earth somewhere in the world, the United States is the least attractive place to do it from an economic standpoint. There's other reasons because of infrastructure and people and so forth. But it's about a billion dollars' difference for us on a \$4.5 billion factory.

The difference is not labor rates. It's not really construction costs. It has to do with government incentives, tax credits, equipment incentives that you get almost anywhere else on Earth, because they want that village built in their backyard. A semiconductor factory attracts a lot of other industry around it.

The U.S. does not have an industrial policy that follows those guidelines. I'm not sure that it should, but it's just a difference. So when you make these decisions as a CEO, you're looking at numbers, but you're also looking at safety, availability of a workforce, and other things that are softer dollars involved in this.

Interviewer: At Intel, R&D is your lifeblood. You're pushed by Moore's Law, and you're pushed by needing to imagine what is going to fuel the products 10 years from now, what that technology looks like. The U.S. government has an R&D budget that's been estimated at about \$150 billion, which is significant. What's your view of how that's being spent?

Paul: I don't know. I don't have that much insight into it. The things we look at are what the NSF is doing in particular in the areas of advanced research around materials. I mean, we're a materials science-based organization. We don't see the end of scaling of silicon for quite some time, but it's going to end. At that point in time, we have to shift to other kinds of materials. We're working on things, but I think also the government has investments in that area.

By the way, the government doesn't do the research. They pay for it. It goes into universities. What Intel does is we tend to co-invest with those kinds of research grants to double-up the capability of the time-to-market that some of these things can be achieved.

Interviewer: Is there a consistency in terms of the investment in that? Or is it an inconsistent sort of political

Paul: Well, it was on a declining slope as a percent of anything for a long, long time. And then two and a half years ago, Congress passed the America Competes Act, which included a number of things to sort

of resurrect American manufacturing and research. They didn't fund it. It didn't get funded until the stimulus package, which means that it gets funded for at least a year, but then you're back into this scenario next year of is it funded again?

When you're doing long-term research, particularly in university levels, you can't have waves. You have to be able to hold that funding long enough to be able to get the result.

Interviewer: Right.

Paul: So I think we're setting ourselves up for an issue here.

Interviewer: Got it. Given the length of time it takes -- remind me again how long it is from the point at which you make a decision to turn the first spade of earth on a manufacturing plant to when a product comes out of the manufacturing plant -- how long is that?

Paul: If it's greenfield, start from scratch, about three years.

Interviewer: About three years.

Paul: Yeah.

Interviewer: What we've been talking about here in this conference for the past two days really are a lot of products that feel very new, particularly in the mobile devices space. What is being built now that's going to

fuel products three years from now? What are the things that you're building that haven't yet made it into our jacket pockets as complete products?

Paul: Let's go back to Moore's Law. What Moore's Law does is it gives you a template to build things either at much higher performance, or much lower power, or much lower cost, or much higher integration. Those are the vectors that you get to play with when you expand technology along Moore's Law.

So for mobile devices, what we're aiming at essentially is a whole family of products that are system-on-chip, aimed at different market segments. We've been able to shrink the microprocessor

Interviewer: When you say "system-on-chip," what does that mean?

Paul: We've been able to shrink the microprocessor down to a very tiny part of the chip. So we can use the other transistors available on that chip for all the other functions in a system. So we can put graphics, memory control, things for communication subsystems, video, compress/decompress algorithms and so forth.

You mix and match all those features around the microprocessor on the chip tailored to the device at hand. So the system-on-chips we'll do for a set-top box are video-centric, but have the Internet capabilities to be able to bring the Internet into a television space.

The stuff we'll do for a navigation system in a Mercedes Benz is different, but still has a microprocessor at the heart of it.

Things that we do that go in your pocket -- a handheld device, smart phones -- are focused on the lowest power, all-day kind of battery life, which is what minimum you need on these things. Very high performance, because I think social networking and the things that people use smart phones for will be increasingly rich in terms of the experience, not just textual.

So we want to be able to have very high-performance graphics and video, and high-definition video on these smart phones with the minimal cost, and keep the form factor very, very thin.

Interviewer: I think I ask you or someone this every year. You mentioned it. There's a point where you can no longer [unintelligible] any thinner on a wafer of silicon. What happens after that?

Paul: You get a new CEO.

[Laughter]

Paul: Actually that was a joke.

[Laughter]

Interviewer: For any of you stock analysts out there.

Paul: We have built transistor structures three generations out. [That's] shares. So we know how to do this at least three more generations. And if you talk to Gordon, Gordon Moore, he'll tell you that he never saw how he could do things more than five years out.

Interviewer: Right.

Paul: Moore's Law is not a law of nature; it's a law that reflects human inventiveness. What this is about is a challenge to our designers and to the industry to continue to shrink things. As I said, we can see silicon scaling at least three more generations, maybe four.

Interviewer: How long is a generation?

Paul: Two years.

Interviewer: Two years.

Paul: Right. Maybe four. And we have prototype devices beyond that that are non-silicon-based.

Interviewer: Can you tell me with what they are based?

Paul: Nope.

[Laughter]

Paul: You know, this is way out [unintelligible].

Interviewer: [Even if I'm really] nice?

Paul: It's cool.

[Laughter]

Paul: Trust me.

Interviewer: It's cool. That sounds like what my son says, "It's cool, dad. You don't really need to know." Let's talk a little bit more about mobile. Reviewing all the things that you've been talking about over the last year, you talk a lot about extending the Intel architecture beyond the traditional PC business. Atom is a big part of that. Talk to me about how important that is to your business.

IDF, your conference, for example, I noticed if you looked at the registration roll of 10 years ago, it was almost all PC OEMs. Now they're a small group in thousands of different industries which come to your developers' conference to learn how to integrate your products into cars, integrate your products into appliances, and so on.

Paul: Yeah.

Interviewer: Talk about the Intel architecture as it extends beyond the traditional PC world.

Paul: Sure. I view this as building a continuum, a continuum of devices that all compute, that all talk to the Internet, that all have common capabilities across a spectrum of devices from a PC, to netbooks, to handhelds, to consumer electronics devices, and to embedded control.

So that same architecture instantiated on the chip at different price points and different costs and power points gives a very consistent horizontal model for developers to be able to write [ones too], and be able to have the applications [work], and allow the developers to be able to put their applications on a whole spectrum of devices, you've now simplified the [task] for everybody and you've made the user experience much more consistent.

What I hate doing personally is learning a different U/I for everything I touch. It's a pain. Let's just have it be consistent, have all those applets on all those devices, if I choose, and rock and roll.

Interviewer: Do me a favor and tell everyone you know in auto manufacturing to figure that out, because I still can't make my nav work. That's my own problem. You showed a very interesting graph in one of your speeches. I think this was kind of instructive. The adoption of the netbook is actually pacing faster over time than both the Wii and the iPhone.

Paul: Yeah.

Interviewer: Why do you think that is? Who has a netbook out there, by the way? Raise your hand. Raise your hand if you have an iPhone. So it's not happening in this room.

Paul: Right, right.

Interviewer: But it's happening larger out there --

Paul: Yeah. The first round of netbooks appealed to people as machines for their kids. The price point is very low, right? That is very appealing. Kids, secondary machines into households, and so forth. Now it's starting to sell into first-time users in emerging markets like India. It is the first Internet experience that people are getting.

I think that the screen size and having a decent keyboard is a different use model than the best of the smart phones. It's just different. Not any better, not any worse. In places like San Francisco, you have both. Everybody's got a laptop and an iPhone. It's going to happen. In other places, people have to make a choice, at least initially on.

Sometimes they'll choose a phone, but very often a smart phone doesn't give them the full utility that they want. If you want your kid to be able to do homework research, the iPhone is not the best

device, right? A PC is a much better device with the I/O and the screen.

I think that things are just going to get better. We're going to put more capabilities into the netbooks and make them look more like smart phones. They're going to get smaller. They'll have GPS. They'll have cameras. It's just a different form factor.

Interviewer: We have some time for questions, so if you have questions for Paul please come up to either of the microphones here. You may recall a couple, three years ago, Bill Gates and Steve Ballmer were sort of aggressively defending the PC as a use case against this onslaught idea of the cloud.

Now I think it's fair to say that Microsoft has embraced the cloud, and that debate maybe isn't a debate anymore. And the PCs are still around. What do you make of the shift to computing and services in the cloud, and how has that changed the strategy at Intel?

Paul: Well, from a hardware perspective, it doesn't change things much, except we'll sell a lot more servers and server chips. I like Ellison's definition of the cloud. He recently said, "There's nothing new here. In the cloud, you still have servers, you have networks, and you have clients. What's different except the name?"

The difference is some of the use model. I think pushing some of the applications into the cloud makes a lot of sense for many of the

things that you guys are talking about here. I don't think I'm going to put my payroll system in the cloud anytime soon, at least not in someone else's cloud, or my accounts receivables. Then you're down to, "Well, is it a corporate cloud? What's the difference between a corporate cloud and your data center that you already have?" Not much.

Interviewer: Right.

Paul: At the end of the day, this is just a different kind of usage model. It'll still sell the same kinds of chips and principally drive a lot of server sales.

Interviewer: If I could take you back to policy for one second and ask more broadly: First of all, I imagine Intel does spend a fair amount of time lobbying in Washington. And we have a lot of folks from Washington here this year in particular. What are the top issues that you spend time paying attention to and trying to influence --

Paul: For us right now, the top issues are taxation. The proposals around eliminating deferral would have been, I think, very, very bad for jobs in the United States.

Interviewer: Allow me to ask a dumb question, because it is my job. Eliminating deferral?

Paul: Deferral is the longstanding policy. If a corporation has earnings overseas, the taxes on those are not U.S. taxes until you bring the money back, right? So if you have a lower tax rate in Timbuktu, that's your effective tax rate there until you bring it back. [All there is is] worldwide taxation in the U.S.

Bringing the money back and reinvesting in the U.S. is really what it's all about, and you want to be able to allow corporations to do that, to be able to create jobs in factories here. And there was a proposal in the administration that seems to have been now put aside to do that.

The second thing is on corporate tax rates, which are on average about 10 points higher than the rest of the world. So effectively it's a tax on our productivity, which means that you can't employ as many people and can't grow as fast. The third one is R&D tax credit, which is half of what the rest of the world is; and often is turned on and off depending on [the will of] Congress. So the tax things are important for technology industries.

The second thing we're focused on in Washington is patent reform, which is just a mess right now. I think toward the end of the last session, there was a good chance that pharma and technology in the universities and small investors were all going to come together.

There was a consensus around the Hatch-Leahy Bill. It seems to have gotten stalled. I would love to see that go through and simplify

the patent system, take the trolling out of it, and have patents go back to what they were before, which was people that create them use them to protect their business as they grow it, and not try to do extortion with it.

Interviewer: I think I understand who you're talking about. There have been businesses built entirely on that.

Paul: Yeah. And cities in Texas that are built entirely on that too.

Interviewer: What about health care? It's much in the news and in the debate right now. Has Intel taken a point of view on this debate? More broadly, is this market one where you see a lot of potential innovation? We had Jeff Immelt here earlier showing a handheld sort of tri-quarter-like ultrasound device. Is this something that you see as a potential market at some point as big as the smart phone market?

Paul: Yeah. Yes, I do. We're partnering with GE in this area, as you may know. The focus between Intel and GE is to do home health care. It's home health devices. The basic philosophy of let's keep people at home longer is focused on wellness. Even if you have chronic illness, stay at home is the cheapest, nicest place to be, versus hospitals or other kind of facilities. And it's the lowest cost for society.

We're developing a family of devices that allows that to accelerate, to do monitoring of elders in terms of, "Did mom get up today or not?" Blood pressure monitoring, those kinds of things. Video conferencing with your care provider. Intelligent systems that can actually watch and flag problems. Did you take your meds or not? Those kinds of things can significantly reduce the cost.

Interviewer: I think what you're arguing for -- I recall an article that you wrote about this -- we need to actually restructure our approach to health care sort of systemically, from a sort of centralized approach to health care where it's something that we'd go to, to a more distributed approach, like more sort of [in-node] driven.

Paul: Yeah. And at the end of the day, it's focused on a wellness program. It seems [unintelligible]. We at Intel started the program a few years ago around wellness in the U.S., and we've been able to attenuate the growth of our health care costs per employee over three years now. It's basically been flat. There's been no cost to pass onto the employees. We've taken our costs down by getting people to be more fit, to focus on getting tested early and so forth. We need to do that much more broadly as a society.

Interviewer: Yeah.

Paul: [Preventiveness] is a lot easier than dealing with a problem after it's happened.

Interviewer: Yeah. It sounds like a prescription for just about everything we've had here in the U.S.

Paul: Yeah.

Interviewer: Well, we just ran out of time. Is there a question here?

Male Voice: Yeah, just a quick one. Good morning, Paul.

Paul: Good morning.

Male Voice: We are well-aware that Intel [unintelligible] invested in WiMAX. Can you give us an update on how WiMAX is doing globally, and how you position your company in light of the LTE [unintelligible]?

Paul: Sure. WiMAX is alive and deployed as kind of the world's first fourth-generation network in Japan, in Korea, in the major cities in Russia. Clearwire in the United States is now deployed at I think half a dozen cities, with plans to get 120 million pops by the end of next year.

So it's off and running. It is a proven technology. It works well. I've used it in places like Tokyo. It's pretty cool. When you walk around the streets of San Francisco on a 3G network, you realize you need more bandwidth still, trying to get things on your phones.

LTE is, I think, an alternative. Technically, they're very similar. In fact, the early LTE trials are being run on WiMAX base stations. The issue there, there's some business model differences. I think ultimately the two technologies will have a means of interoperating, because that's what consumers will demand. But they're likely both to be deployed in various places around the world.

Interviewer: We've got one over here.

Male Voice: Hi. A quick question. You see more and more the devices now get smaller, the user interface is getting smarter. I always believed that you can never have enough devices connected to the Internet, to your fridge, your stove, and stuff like that. You're always looking for information.

How can processors and chips help you get away from the keyboard? Where are we with speech recognition and having access to the Internet and everything without being attached to the keyboard? That's what I'm looking forward to the future, and I find that progress has been very slow.

Paul: Cognitive speech recognition has been five years away for the last 30 years. Right? And I think it's still five years away.

[Laughter]

Paul: The stuff is getting better. Maybe Tim will talk about this later on today, but it takes a lot of intelligence to be able to make things simple. The problem with speech is that you can't be 99.99; you have to be “Star Trek” perfect. And we are so far away from being able to put that level of compute capability into something in your fridge. To me, that's the Holy Grail. I agree with you.

And to me, that is one of the reasons that allows us to have confidence to invest in these new technologies, because we know there's an insatiable demand for performance when you start breaking the barriers of things like speech.

Interviewer: Unfortunately, we are out of time. Please join me in thanking Paul for coming to Web 2.0 again. Thank you very much.

[Applause]

Paul: Thank you.

Interviewer: Appreciate it.

[End of recorded material]