CENTER FOR GLOBAL DEVELOPMENT

Presents

Open Source, Open Education and Eco-friendly: Can Sharing Improve Policy?

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[TRANSCRIPT PREPARED FROM AUDIO RECORDING]

Lawrence MacDonald: Good morning. We've just received word that Scott McNealy's running a little bit late, so you can continue to chat among yourselves, and we will start just as soon as he arrives. I expect he'll be here in about five minutes. Thank you.

Lawrence MacDonald: Good morning. I'm tempted to say good afternoon, but it is indeed still morning. Thank you for your patience. I'm Lawrence MacDonald, Director of Communications and Policy at the Center for Global Development. I'd like to thank you for choosing to be indoors on such a beautiful day.

This is a rather unusual event for us, as those of you who know the Center from other events, are well aware we normally focus on development policy issues. One of the key ideas, and we have many ideas and sometimes they're contradictory, but one of the key ideas that I think all of our fellows at the Center would agree on is that the ways that the rich world influences the opportunities that poor people have in the developing world is about a lot more than foreign assistance. And those of you who know our commitment to development index will be familiar with some of the components, which include investment, trade and technology, and of course those are all private sector activities, and we have an intense interest in the way that the private sector companies in the rich world interact with the developing world.

We also have a keen interest in technology, and while we're very far from bleeding edge, we like to think of ourselves among the think tanks as being more pro-innovation than some. So there is a number of overlaps between the talk we're going to hear today and the interests of the Center.

One of those overlaps has to do with the role of the private sector. We often have firms come to us and say, "We want to do more than corporate social responsibility," or "We're doing a lot more than corporate social responsibility, how can be bring some coherence to our work?" So we did this report recently, *A Menu for Corporate Engagement: Joining the Fight Against Global Poverty*. We interviewed about 20 leading firms as to how they go about this, and prepared a list of activities. One of those firms was not Sun, but I suspect when we hear from Scott McNealy today, that we'll find that there are a number of ways that the activities that he's involved in overlap with this.

It's now my pleasure to introduce our chairman and cofounder, Ed Scott. Ed epitomizes many of the themes that I have been talking about. The founder of BEA, the assistant secretary of transportation in the Carter Administration, he combines both private sector experience and government, and brings to the Center one of the most valuable attributes is his huge impatience for change. It's my pleasure to introduce to you, Ed Scott.

Ed Scott: Well if you think I'm impatient for change, you should have worked at Sun in the eighties and nineties. That's a place where impatience was the watch word. But it's a great pleasure for me to be here today, and it's an incredible pleasure for me to have the opportunity to introduce Scott, a person who I don't have to look at any notes because I worked for Scott for three years, and worked in the Valley where he worked for seventeen years.

Sun Microsystems really is all about openness, which is the subject of today's seminar. Sun was founded on the idea of taking parts and technologies that were generally available in the marketplace, and creating a computing platform which later became a network computing platform, but the original Sun product had the Berkeley open distribution UNIX operating system. It had a processor board that was a derivation of an open system processor board that was developed at Stanford, and it had monitors and disk drives, and other power supplies that were available on the open market. So there was very little proprietary technology. The whole idea was if you produce an open system, it'll be a big winner. Subsequently, Sun competed with a number of different companies, including one that was quite a successful company briefly, called Apollo Computer, and we used to use the slogan, "We're open, they're closed." It was a very effective and appealing slogan in the marketplace. Scott and Andy Bechtolsheim and Bill Joy founded Sun and Vinod Khosla in 1982. And in 1984, he became the CEO, and on two different stints, spent over twenty-two years in that job.

Those of you who know Scott will probably appreciate that one of his most extraordinary qualities is his nose for what the future is going to hold and what are the things that people really ought to concentrate on in a business setting. I have never seen a person who has such an apt sense of what the next right move should be, and he demonstrated that time after time at Sun Microsystems.

I don't know if he'll remember this small story I'll tell about him, but when I was very early in my tenure at Sun, I went to one of the senior staff meetings, because my boss was elsewhere. Joe Roebuck announced quite proudly at that meeting that Sun had exceeded the revenues of Apollo, and everybody in the room—for the quarter—and everybody in the room clapped. And when they got finished clapping, Scott said, "Look, that's not what it's about at all. What it's about is digital. It's [Deck]. Deck's the enemy—that's the company that we need to be." And people like me looked at this young man and said, "This guy's out of his gourd." Taking on digital equipment—well he wasn't out of his gourd. He was 100% correct, and Sun still exists and thrives, and digital equipment is a faint memory. And digital equipment, for many of you who don't know all the ins and outs of the tech industry, failed mostly because it was a closed system. So the whole issue of open and closed is a very important issue in our society, and I think you'll all very much enjoy the opportunity to listen to Scott and then the various discussants consider these issues about how openness can affect the economic development in the developing world and elsewhere. So with great pleasure I give you Scott McNealy.

Scott McNealy: Thanks, Ed. Well done, and he did okay after he left Sun, didn't he? There is life after Sun I guess, so—I haven't figured what that is yet, though. I'm a little tired today. I'm a fairly avid former hockey player. I broke my leg about a year ago, so I'm now just the coach, and I got my four boys playing, but we're all pretty strong Shark fans. My boys all play in the Junior Sharks program, and so on the way out to D.C. last night, I decided to touch down in Dallas to witness a four overtime loss and elimination, so I'm kind of—please don't hand me any razorblades or anything at this moment in time, but I'll get over it. I know you all miss Ovechkin out here, but anyhow, so that's why I'm a little bit tired and a little bit of a frog voice, but I'm always excited to talk about what Sun's about and that's this whole concept of open.

And I know open is a screwy word, so I'm going to try and get you to replace it with a different when you hear the word open, and let me get to that first. But to set the stage a little bit, the Internet's growing like crazy. I don't think I need to share that. My favorite statistic, and there's a million of them—you know, 400 gigabytes of data created every second or whatever. My favorite statistic is China Mobile. China Mobile added—went from 300 million subscribers last year—the beginning of last year—to 450 million subscribers. That's 50% growth. They now have more subscribers than we have citizens, and that's just one of the wireless companies in China. All of those are basically accessing the Internet from a browser on their phone. In fact, that's how people are getting onto the Internet now. It isn't a PC or a Mac. There aren't a lot of people that can afford a Mac Air, but they all are getting phones and accessing the Internet. In fact, what I did this morning when we landed here, because we left after three overtime periods, is I checked the Internet and found out the Sharks had lost. That is how people are accessing the Internet. What's critical to that is standards. You want interoperability. You want people driving on the same side of the road. We need to have a common way to go make that happen.

It's not exactly helpful that we have competition on which side of the street to drive on. This is where actually governments can get involved. Imagine if we said, "We just don't know whether right or left is best. Let's just everybody go out and drive hard tomorrow and we'll see which side wins." You know, so there actually is some role for government and maybe even NGO—I don't know, I don't want to get into all the religious battles on NGO versus national sovereignty, and all the rest of it. But it is kind of nice when some of these things are actually decided and we can just move on, because it isn't really necessary to have competition.

But that's not to say that IP doesn't matter. IP does matter. I'm a true believer in intellectual property. I'm a true believer in patents and copyright done properly, and I won't go into that rat hole, but that could be a four-year conversation we could have—a four-year study. But without intellectual property and the right—the opportunity to make a return on R&D, you're not going to get big R&D. I

mean imagine if you couldn't patent drugs. Nobody would do the big R&D required, and we'd all die sooner, and live a lower quality of life.

But we also have to be very careful to make sure that patent and trademark office is actually operating under the right guidelines, and there's a lot of people who are very worried about software patents and all the rest of it, but we're a big believer. Heck, we spent a couple billion dollars a year on R&D. I think we're number forty-three worldwide in R&D spending at Sun Microsystems. So remember that, this is aerospace, pharmaceuticals, technology—number forty-three worldwide. So it's not like we don't believe in R&D, but what you're going to hear is kind of strange, and that is we don't think that—there are some parts of the Internet, the IT world, that we think needs to be a little more open and free than it is. Isn't it—I'd love to own English. I'd even take French, as unhelpful as that training in my previous education—as unhelpful as that has been in my career. I wish I'd learned Mandarin or Spanish, living in northern California, but no one owns the written and spoken languages, and the written and spoken language of the Internet should also be equally open. I mean can you imagine if I just owned a vowel? I'd even take Y. Just a nickel every time you used a word or spoke or taught or wrote Y—just a nickel every time. I wouldn't have to work. I could own the Sharks, and away we go.

But that is not the way the computer industry has been or is, and when Ed talked about Deck, they in fact had several microprocessor and operating system and networking and user interface architectures that were owned and patented and controlled, and very proprietary to them and you learned to write in Deck. Kind of like you'd learn to write in Russian. Only the only way you could read and modify and use your Deck applications was to buy Deck hardware. Kind of a strange system.

So Sun, a long time ago, decided to go change all of that. Let me start by really talking about what our cause was very shortly after we got started, but it wasn't really explicit and we didn't make a lot of noise about it, because I, as a CEO, thought it was a little, I don't know, over the top to have a particular cause. I thought that was a little, I don't know, arrogant or I don't know what the right word is, but we've always wanted to eliminate the digital divide and get people connected. I mean the sad fact is 80% of the world is not connected to the Internet. Think about that. No IP connection whatsoever. No phone. No Internet. No browser. No Google. No chat. No IM. No email. Sounds good for about twenty minutes, but then you'll start to shake. You will, trust me.

We want to do that without harming the planet. Because some of the compute strategies that we have, you think we've got a global warming problem now. So we need to find some very energy eco effective ways and I'll touch on that a little bit more later. The first thing is to get people connected, and standing on the shoulders and learning.

There are 800,000 villages, 30% of the villages worldwide, that don't even have access to basic telephone service. So there is a huge divide. Now why do we have a cause? Well, you know what, everybody at Sun is well paid, aren't missing any meals, has a roof over their head, all the rest of it. We don't really understand what—people in the United States don't understand poverty until you get on an airplane and go fly around and understand where the world is. There's a big, big issue here, and granted we're not going to solve the water and the basic Maslow needs, but at some point, when people get to that level, we need to get them connected and part of the digital divide. Now that's our cause and I think every company and organization ought to have a higher order cause other than make money, be number one or number two in market share, grow, and all those other things. Those are kind of basic operating tenants of a capitalist organization, but I think you ought to have a cause.

Our mission is to outfit those data centers that will allow people to connect. Because it gets a little expensive to give everybody a Mac Air, or a new Windows Vista desktop. By the way, it's pretty complicated; you become your own systems administrator. We're certainly not going to do it with mainframes or whatever, we think there's got to be a new way, and we're doing it by outfitting these network data centers. And chances are, if you send email out on the Internet, or if you go do an eBay-like auction or whatever, or go do a financial transaction, you're touching a Sun computer, you just don't know it. I think it's almost impossible to do much on the Internet without touching Sun technology anywhere and everywhere, and that's what we're focused on.

So that gets to—there's our cause and our mission, what's our strategy, how are we going to do this? Our word is share. When you think open, think share. I'm going to sound a little Al Gore-ish here, and Ed kind of set me up. We invented open source. He did the Internet. We did open source. Literally, it started even before Sun got started in 1982, when Bill Joy was doing the Berkeley software distribution of UNIX. It was the first and major open source project, and his Berkeley software distribution license, we open sourced to NFS. We did open source TCPIP, which is kind of the Internet standard now. There was [Token Ring] from IBM. There was LAN Manager from Microsoft. There was Deck Net from—what was the name of the company—Deck. And Apollo actually had the best networking scheme with Domain, and they were all proprietary. We won with TCPIP.

We open sourced all of our technologies throughout, and we've even open sourced our hardware technology today. The Ministry of Education for China was just on stage with me earlier this year announcing that our UltraSPARC microprocessor is now the curriculum reference implementation for all their computer science department of all the major universities across China. Think about that—China has adopted our free and open source. And with support license an indemnified architecture from a WTO perspective. That's important, so

you don't feel like you're stealing somebody's IP. You got somebody standing up for it. Pretty interesting strategy.

We're open sourcing all of our software. We've been doing this forever, since 1982 and before, and we're in nineteen straight years cash flow positive from operations. We generated over $300 million dollars in cash despite the gap accounting that we announced earlier this month. We keep spewing cash. We got several billion dollars of cash in the bank, and are growing this company very nicely. So this concept of sharing will never win the America's Cup. I won't personally be able to inoculate every child on the planet, but we're actually doing quite well. I haven't missed many meals and don't worry about me. That sharing works, even though we're open sourcing and there are free downloads—to give you an idea the numbers are pretty spectacular. We have a database called MySQL that gets downloaded 70,000 times a day. Those of you who are spending money for Office, we're doing a million downloads of free Open Office. In fact, the Google download pack has the Enterprise version called Star Office. If you go to Google, do a free download of their toolbar download pack, and you get Star Office with it for free. Did I mention free? And it works great on no matter what computer you have. We've had twelve million downloads of our operating system. That's like a telephone switch operating system. We've downloaded twelve million times. That's kind of the equivalent of that—I can't imagine any of you downloading a telephone operating system, but why do you download a computer operating systems? Anyhow, you do it.

There's a, why would we do open? Why would you care about open? I'm going to go through this very quickly, because I got too much stuff to cover. Maybe in the panel we can dive in deeper. First of all, the barrier to entry is zero. Just click. Go to our website and download all of our software for free. Did I mention free? The only cost is the opportunity cost of the download. Go have a cup of java. Come back and you'll have the software for free.

Secondly, it interoperates with everything because the on/off ramps, the protocols—it's not the theory of operations; it's the actual implementation of interoperability is there on the Internet so everybody can access. You know the number one platform for our operating system, Open Solaris, is Hewlett Packard. I can't stop that. I don't want to, but I can't. We can't prevent them from porting to it. Dell's an OEM. Intel OEMs our operating system. They don't OEM Windows, but they do OEM Solaris. Interesting huh?

It lowers our R&D cost, because we've got the community helping us. Java on the phone was—this is kind of a dirty little secret about our sharing thing. This is a Java phone, a BlackBerry—in fact, 80-90% of the phones out in the world today now have Java on them. We went to them and we said to Nokia and Motorola and Samsung, we said, "Would you like to see Java on your phone?" They said, "Yeah." We said, "All right do the work," so we sent them away. They did all the work; they gave us the implementations, the reference implementations, the

source code, the test fixtures, the compatibility suites, all the rest of it. Then we licensed the work that they did back to them at about a twenty-five, thirty cents a phone. But we did it fairly and equally, because we didn't let anybody get a head start. And then they get to put our brand on, and then we indemnified. Isn't that cool? They did all the work. Think about the ROI on when I is zero, and revenue is every time they ship a phone, they send us a check. Now understand we don't make money on Java. I don't want anybody to think we made money on Java. I don't want—to understand that sharing can be quite profitable.

If you notice, Google is free. They seem to make money. Free is an okay mall. And what we're doing here is leveraging our—think about all the people making Open Office. It's the largest open source development community in the world, all competing against Office. How'd you like to be the Office product manager when there's a million downloads a week? What does Office sell for, $400? That's $400 million dollars of opportunity lost every week, because it was free. Did I mention free?

Next, it's more secure. If there are no secrets in your code, then you won't have a breach. If you have a secret in code you will have a breach. If it's open and everybody looks at it, if there is a hole, it'll get discovered, it'll get fixed, and you'll feel safe. All of you have Java devices. If you have a Blu-ray DVD, if you have one of the new set top boxes, if you have a new cell phone, except for the iPhone, if you have a PC—we do fifty-five million downloads a month to PCs of the Java runtime environment. If you have a common access card here in the U.S. Government, whatever, you run Java. Can any of you name a Java virus or a Java breach or a Java disaster, a Java CNN moment? All the codes have been looked at. There are no secrets. It's safe. There's no Trojan horses. There's no secrets to be discovered and breached.

Finally, your barrier to exit is zero. How hard is it to switch from a Ford to a Chevy? There's no barrier to exit there. Try switching from English to Mandarin, especially if the theory of operations is all hidden and proprietary in source code. That's the beauty of having an open source environment is that you can switch. Think about trying to get your data out of a proprietary database, or try switching from a Windows machine to a Mac and move all your data over. Try switching from Windows to Vista. I mean it gets all very, very complicated and difficult, and I go back to, what is the barrier to exit to switch from a Ford to a Chevy, and open source is trying to do that.

Now this all comes with some really big ideas. One, is we have a complete open source stack on which the U.S. Government could build their entire web services stack—the microprocessor, the operating system, the mail, the calendar, and the directory, the identity management—I'm using technical terms, but it is—think of it as Google for any particular government could all be built on open source. You could provide all of the services—voting, polling, entitlements, registrations, licensing, census, anything that the government wanted delivered and any of the

services—mapping, communications, whatever. We have a complete open source stack that you could build open gov on that would require you to buy absolutely nothing from Sun Microsystems. Absolutely nothing. You don't have to buy a server or a storage device. You don't have to buy any support. You don't have to buy anything from Sun. How much more open can you get? Well, China is very excited about this and they've adopted OpenSPARC, and guess what operating system they're going to run on OpenSPARC? Probably open Solaris, and guess what web services stack? You think they'll do dot.net or open Java? Do you think they'll use our developer tools or you think they'll use open MySQL or Oracle?

So there are governments around the world, and I've been running around talking to all of the industrialized nations that want to get into building infrastructure to go deliver these web services and talk to them. It doesn't help to go to some of the developing nations, because they're not in the business of building web infrastructure, but Germany's kind of interested in this. I was at Merkel's office with her staff and they were very excited and they're coming over to California to say, "Are you guys really serious about this?" This is a $26 billion dollar contribution to Germany—nonexclusive contribution, because we've done that much R&D. We're at a $2 billion dollar annuity of Sun R&D that we're contributing to this open source community, to go effectively make available the written and spoken language of the infrastructure environment. This gives an enormous amount of access. I've talked to France. I've talked to Korea. I've talked to China. And I'm trying to talk to the—I was just in with some generals from the air force and I said, "It really pisses me off that China is all excited about this and the U.S. is kind of standing around having a committee conversation." Kind of interesting.

It increases access for citizens in a big time way. If you think about the numbers that are out there, it's every citizen plus some in the U.S. here, that the U.S. government, or any particular government, needs to get access to. It provides a safe and secure way to go do that. It's actually quite interesting to think about how much Internet usage there is out there today. What was the number of—$10 billion videos per month are viewed. Ten billion videos per month are viewed out on the Internet today, so it is still a huge story when there's a security breach on the Internet. I mean it makes the news. But you think about the bazillions of transactions that are going on, you're dealing with, from a sigma perspective, a very safe and secure environment. I always chuckle when people are saying, "I don't know if I can go on the Internet, it's not very safe." And then I think, "What do you with mail?" You take an 8 1/2 x 11 sheet of paper and you write in English unencrypted, you fold it up, put it in a paper-thin envelope, seal it with spit, you put the ship to and ship from right on the front, then you give it to the government, who then delivers it to my mailbox, which is a tin box with a tin door, no lock, on a publicly available street, and it sits there until I get to it. And you're worried about doing email. So I find it fascinating that even today people are worried about getting online.

There's a big deal with government organizations around the world about – in fact, most organizations have a requirement to keep – the library of congress is supposed to keep everything forever, basically. I mean that's their charter. We were at the library of congress recently and they were showing us book rot. You know where the pages were actually falling apart and all of the rest of it. And then they have bit rot because they put it on tape and then the tape deteriorates or the CD deteriorates. Well they have another thing called format rot and format rot is where you put it in a WANG processor and then 20 years later you try and bring the WANG file up and there's – WANG's gone.

So, the concept of having Open Office or MySQL is if you have a document or a database, you can actually bundle the open source implementation with the archive for free, no extra charge. So that 30, 50 years when you bring that up, you actually have the open source rendering and management environment for that document along with the actual archive, no extra charge. There's, there are some really interesting, unintended consequences of open source technologies. It drives an enormous amount of efficiency. Did I mention free? And the concepts of spending money on the written and spoken language, as opposed to just using it, like I said. Just think how rich I could be if I just owned a couple of the letters or maybe, maybe a couple of the numbers. You know, I'll take –I'll take the even numbers, just the even ones and charge a tax for that. Now, there's somebody here in the audience, Dr. Bobbi Kursham. She and I got together on an idea and said, lets take sharing beyond – why are we open sourcing spreadsheets and browsers and operating systems and other arcane, weird stuff. How about k-12 educational materials? How about the textbooks, the self-paced online, on demand curriculum, Java browser base? How about the testing and the assessment tools? Do you realize the number we spend in the United States alone is 4.3 billion dollars on textbooks alone, every year, every year.

Now there are some folks who are almost my age in this – I guarantee if we took whatever 3rd grade math textbook you all learned from and gave it to all of the kids today, there would be no drop in 3rd grade math test scores, none. In other words there has been absolutely zero evolution in 3rd grade math textbooks. You could take the one I learned on and you could still teach kids 3rd grade math. Because you know what 10+10 was, is and will be 20 for a long, long time.

Now why does it cost $130 here in the U.S. for a 3rd grade math textbook and why do they gratuitously revise it every 4 years? And do we know if it's any better or not? So imagine we had a free and open source version and by the way, there are 10,000 learning assets already available on this site, for free in source. And we have a Facebook like capability; so a teacher can create a folder, download any of those 10,000 assets. We have developer tools so you can create new assets; we can upload video and upload work sheets and anything else, and create a little curriculum for the incoming 3rd grade math class as a teacher and password

protect it and publish it to the parents and students of the incoming class. Did I mention free?

How cool is that? And then you know what, if you come to me and say I've got a better chapter 4, we can give this half of the class chapter 4, this half of the class chapter 4 prime and we'll have statistically significant evidence very shortly to which is testing better and then we have the new reference implementation. So, now we're getting science and we get a huge community and we setup a kind of a community section, where we're getting self developing groups out there who are creating little birds of a feather kind of community out there on all kinds of different topics. Different geographies, different whatever.

Now, you can go self-paced, because kids don't all learn each topic at the same rate, at the same time. This is unleashing education in an enormous way. Very, very interesting; we just won the UNESCO prize as one of the great e-learning sites. All we did was steal all of the sharing ideas of the Java community process, of open source, of sharing and providing zero cost of goods sold, zero distribution and plummeting engineering costs. Because we've got the whole world helping to go make it happen. I would encourage all of you to go to the site and just test it and play with it and try it.

It all got started because my 3rd grader at the time wanted to learn about electricity and I went all over the web and I finally found a welding site that had a nice little self-paced – and it was a great father/son moment until we hit the welding section. I thought, why isn't there a place? So, Wikipedia took out Worldbook. Google took out the CardCatalogue. This has an opportunity to really change things in a positive way. And it drives an enormous amount of innovation, this whole sharing thing. It's a big deal. It's a big opportunity and you know, the stunning thing about openness is – isn't if fascinating that we have an H1B Visa cap here in the United States.

Let's not let the smart people in. We certainly didn't want Vinod Khosla and Andreas Van Bechtolsheim to come in here and James Gosling – invent things like SPARC and Solaris and Java. All 3 of those immigrants that you know, we don't want them to take jobs away. Do you realize how many jobs and how many taxes and how much training Sun Microsystems has done, just one little company and kind of founded by a bunch of immigrants and one local Yankee?

It's pretty stunning when you think about it and yet we're kind of capping. We don't want that brain influx but, whatever, I digress. It's wacko. How do you all get there? I think – the most important thing is, you know it ain't going to happen over night but you've got to start standardizing on standards. Standards mean something that's high-volume, but it's got to be open. You know, somebody says Windows is a standard, yeah, it's a standard, its high-volume but it ain't open. So you've got to get open and standard, you've got to get a standard that's shared.

I wish I owned brake pedal placement. I wish every company had to pay me $5 every time they put the brake pedal to the left of the accelerator, but no that's something that probably ought to be shared. It's probably a good idea that when you rent a car that one of the things you don't have to think about in a moment of panic is where's that darn brake pedal right now? And you know that's a big win. So, develop an open source policy. Procurement and standard setting has to take into consideration is it an OSI standard? Is it truly shared? Does it have intellectual property protection? Is it free and clear? Is it – is there a reference implementation that's available for free and is it supported and backed by a real large – a real live vibrant community.

There's a lot of – lot of people say I'm open source, but they really aren't. A couple pieces are but enabling technology isn't and you have to be very, very careful. So anyhow, enough on open. I want to finish with one other topic, if you remember, eliminating the digital divide without harming the planet. We've taken the concept of eco responsibility and really worked it very, very hard. 40% of the cost of running a data center is power. Somewhere between 7 and 50% of power is lost in transmission.

There's a huge disparity between different microprocessors in terms of how much power per transaction they drive. We're at about 1.5 watts per hardware thread. When many of our competing technologies are at 50-130 watts per thread. You know, like a Google search requires a thread, YouTube download requires a thread or an eBay trade requires a thread. A Merrill Lynch transaction requires a thread. You start adding these up and it is no surprise that Google is building their next data center up in the Pacific Northwest to get at cheaper power. Because that's their number one discretionary item is running the power.

Now, we have thin clients, they're at 4 watts on the desktop. I guarantee you your laptop or desktop runs at more than 4 watts. We're talking like a night light, 0 administration centralized. We're using the virtual technologies to drive efficiencies. There are lots that we're doing. We moved things to tape and we actually have a Chief Eco Officer. We have another CEO. It's a little different than 100 years ago, there were CEOs in companies, and they were the Chief Electricity Officers now, that doesn't make any sense anymore. Now we have Chief Eco Officers, ours is named Dave Douglas and he spends his entire career basically working on how to take tons of carbon dioxide output out per year. And we have invested and integrated all of these savings and I won't go into the great details, but we take this very, very serious – we've been doing this way before eco was cool. Because we saw economic as well as ecological in the eco responsibility phrase. So, it's a nice corporate – social responsibility thing, but it's quite profitable too.

And it's quite interesting now that most of the CIOs in the world didn't used to have to pay energy bills, so they didn't care how much they – now most of them are getting charged for their electrical bills, that's part of their budget and they're

taking this much more seriously. In fact, there's a very large three letter agency not too far from here, that basically stopped buying computers a little while back because they couldn't power and cool them. So, this is a – it's not just an economic issue, it's actually a physics issue of trying to figure out how to you know, make this happen.

So, we have even gone to building a community, we're all about community. And it's interesting, I'm going to use – before I finish this, while I'm on the community where a lot of – one government agency was actually being told by the administration that open source was a little bit – what was the phrase they used? Communist. Now, I am probably – you have not met a more raging capitalist than yours truly, right up here. I am a stunning, raging capitalist and I've got an honors degree in economics from Harvard and wrote a thesis on antitrust and all of that.

I mean, I understand the market economy a little bit. But, let me tell you, open source is not – just because it has community aspects - doesn't mean communist. In fact, proprietary code is much more arguably a central planned economy. Because there is one provider of technology, there is one central planner and one person who decides what happens with it. Open source and communities are all about competition, competition of ideas on market economy and the invisible hand working to go evolve the technology forward.

So we put together openeco.org. I encourage you to go check it out. Log onto the website and you can track your carbon accounting, the best practices, all of the rest of it. And we encourage governments and NGOs around the world to start leading the way on this and help out so we'll help. Like I said, we've invested pretty aggressively. We've got lots of – it's interesting, it's a little tougher to get the U.S. government to get focused and organized on this but that doesn't stop us and we're going to continue to bang the drum. I'm here about every 30 days talking to the civilian agencies, the administration.

I should probably spend more time on the hill but I get headaches easily. So, anyhow, we have our 6 billion dollar contribution that we're making to eliminating the digital divide and providing eco responsible technologies and we'll continue to go do that, going forward. So anyhow, I think at this point we're going to do a panel and Q&A section, thank you.

Lawrence MacDonald: Ellen and Dave if you could please come up and join us, please. I'm really looking forward to this discussion because I had a lot of questions. Most particularly, what the heck does this have to do with development? And we have two excellent discussants with us; I'd like to introduce them. First, Ellen Miller is the cofounder and executive director of the Sunlight foundation and Ellen, in reading through your bio; I realized that you've been associated with most of the online responsible government things that I admire most. So, we're

very pleased to have you with us today. Including, Center for Responsive Politics, Public Campaign, tompain.com and currently at the Sunlight foundation.

Dave Witzel is somebody that I've known for a long time, when he was a consultant at the World Bank. He is the cofounder of Forum One, a firm that helps us at the Center for Global Development. And as you've seen in his bio, his list of clients, while he's at Forum One, have included many of the policy organizations that are standard fixtures here in Washington D.C. related to development. And Dave is currently associated with us here at the Center. He is taking a year off for a sabbatical to focus on the policy aspect of his work, rather than the IT portion that he normally does when he is at Forum One.

Ellen, I want to start with you because the work of the Sunlight Foundation is very much a matter of openness, in terms of making data open and accessible and using that to try and improve and transform U.S. government. And I'm wondering, how important is it to have an open platform? A lot of what Scott was talking about had to do with sort of what I think of as the nuts and bolts of openness and you're sort of more on what I think of as the contents side. Does it matter? I don't know what Sunlight runs. Is there a connection or could you run Sunlight on a proprietary system?

Ellen Miller: Well, it would certainly be counterintuitive and philosophically inconsistent to do so. I'm still, I must say, sort of laughing over Scott's comment about how he gets headaches when he goes to the hill. One of our office supplies are large bottles of Tylenol for the staff. I mean, and I think – I think where we really have to start is sort of – I don't know, further back or closer in. There is a fundamental, cultural change that has to happen; not only with government to embrace the notion of openness, but even in the NGO sector to understand that of, by and for the people, now has become of, by, for and open for the people. And so I think if that is our end goal, which it is for the Sunlight Foundation, then the challenge for us is, how do you bring these parties together?

How do you bring the philosophy of the open source movement to the open government advocates and to congress and the institution of governments itself? That is sort of – a more fundamental challenge that we have.

I'm going to give you an opportunity to ask Scott a question as well. Dave, you've been talking to me and I know others at the Center about the idea of a policy commons and I had a hard to bridging from what Scott was saying to your interest in policy and the creation of shared assets online and what that has to do with development. And I wondered if you can help me to connect the dots between your interests and the policy comments and what we heard today.

Dave Witzel: Well, I guess what – what's exciting me about the stuff that Scott and Sun are doing is that they're taking the concepts that are being developed in the technology community around hardware and software and the value of openness

there and now they're moving them into education and they're moving them into environment. And I think the same concept is just as Ellen was saying, apply to governments as well. But we're going to see a huge impact on openness transparency; the ability for people to organize to communicate, impacting the way we govern ourselves and so it will be transformative of democracy.

And the question is, kind of, how are going to do that and how quickly and what form will it take?

Lawrence MacDonald: Scott, listening to you talk, I was thinking, well there are you know, 2 billion people in the world who live on less than $1 a day and you said yourself that you know, you're not talking about selling this stack for open government to developing countries because, although, in some cases, China, they're certainly building infrastructure – information infrastructure and in other cases they're just really not ready and able to do that. And I'm wondering if you can help me to connect your company's mission and your ideas about sharing, with what seems to me, to be one of the great challenges of our time, which is, how do we make the – make it possible for this huge number of people to have a minimally decent life and at the same time, as you mentioned, do it in a way that is sustainable for the planet? And how does that connect to the information piece? I'm having a hard time putting all of this together.

Scott McNealy: Yeah, well, by definition if you own and control something completely and you're the only supplier, your pricing model is very different than if everybody has access to the core technology. And certainly if you're a writer you've got to compete with all of the other writers who understand that language. So, if you're a writer in Mandarin or a writer in English you got to compete but if you're the only one and everybody speaks Mandarin but you own Mandarin then I mean, whatever book you write, you're going to charge – somebody who wants to read something. So the pricing model of competition, of choice, all of the rest of it, drives a cost of effectiveness that is much, much more affordable to the developing world. It – it also brings these technologies by open sourcing Java, we have Java on the phone, we have Java on the Blue Ray DVD. We have Java on the set top box. We have Java on a whole bunch of devices that are a lot less expensive than a PC.

And as a result, you can now deliver this common platform on – all of the way down to Java cards, but the number one device, as I mentioned, is the Java phone. That is how people are – of these people, these 3 million new Internet accessors, every week I think was the statistic, the bulk of them are not getting on with a PC, they're getting on with a Java phone and that is a much more low cost, affordable and useful. In fact, even here in the U.S. go to your typical 16-year-old and say I'm going to take away either you PC or your phone. Which one do you think they'll give up first?

Lawrence MacDonald: Well, I've got two, one 17 and one is 15 and it would be hard but I'd think they'd keep the phone.

Scott McNealy: I think so; you'd have to pry it off their cold dead hands. I mean, it's just – it's – and by the way that's where the world is moving. And you know, we all kind of grew up in the PC era where you know, it's kind of like, did you really have a computer in your house dad? What were you thinking? So, I think that's the way we're going to eliminate this digital divide and again it's the open source technologies. Now Apple's going to try and get into the phone business and Microsoft's been trying to get into the phone business but bottom line is Java is already there and Java is the programming environment. And it's on 2 billion phones around the world. It's an enormous amount of press, but there are not a lot of kids in sub-Saharan Africa who are getting iPhones right now. That isn't the way we're going to bridge the digital divide and it may not be as elegant or pretty but it certainly is very effective to be able to give people Java phones.

So that – that's why we share. Now we don't do as well as a company but like I said, don't worry about me, we're doing just fine. We have billions of dollars of cash in the bank. You see my new house; you will not worry about me. We just moved in a week and a half ago, I'm doing okay. It's not Larry Ellison's boat but we're doing okay, trust me.

Lawrence MacDonald: I mean, our bread and butter at Center for Global Development really is policy and we you know. Do research and advocate from policies related to trade, migration, investment, foreign aid, to a whole variety of things. I don't think we've begun thinking about technology policy maybe David Roodman if he's here will correct me on that. You know, we have some work, in terms of in our commitment to development index favoring countries that don't push for what we regard as excessive intellectual property protection, for example, on pharmaceuticals. But I'm wondering you know, what would a pro-development technology policy for the United States look like? If you were to design a technology policy that was going to be good for people in the developing world, what would it be?

Scott McNealy: This one really – I've said IP matters. And I am scared to death that we are not going to allow drug companies to get a return on their R&D. Either through eliminating intellectual property protection on R&D or forcing price controls, because every time you force price controls on drugs then they make less revenue, they make less revenue, they do less R&D, if they do less R&D, there will be fewer drugs, if there are fewer drugs, we're all going to die sooner. And so I get – as a raging capitalist, I think, you know, it – it's absolutely critical that we protect the intellectual property. At the same time I will share with you a conversation I have with the CEO of Pfizer former CEO of Pfizer. I said, we're open sourcing all of our IP at Sun, why don't you open source and contribute to the open source community under an open sourcing licensing model all of your drug development so that everybody can get open access to it?

And this guy thought I'd been doing drugs. And he looked at me and within five minutes he got up and said I've got to go and he ran and he's never spoken to me since. But he didn't understand that contributing to a community doesn't mean you abdicate your intellectual property right, nor do you abdicate the opportunity to exact some return on your R&D should your technology be incorporated for resale by somebody else. So, people don't understand the open source licensing model and the fact that it can be highly profitable, be in a post office box for royalty checks has a huge ROI.

A post office box has very little investment required and the royalty checks are – can be very, very important but there's – there's a huge issue and difference and I want to – all of you policy makers out there understand, IP matters. It's critical to get corporations to make the investments in software, in hardware, in drugs, in communications technology but that sharing can – can explode the opportunities here without destroying the – the ROI models, if people really understand what the licensing models are all about.

So, I appreciate the question. It is actually absolutely critical because a lot of people don't understand the difference between IP and contributing to a community, an open source community. They aren't mutually exclusive and in fact they're highly linked and – and very – I think we're proving that Sun is a – is a very useful model that – that can win very nicely in the market place.

Lawrence MacDonald: Dave or Ellen, do you have additional comments or questions you want to ask before we open to the audience?

Ellen Miller: I think we should turn to the audience.

Lawrence MacDonald: Questions, comments? We have a diverse group of people here, a number of bloggers, electronic media, some people from environmental organizations, people from developmental organizations; are there any questions? Bill Savedoff. Yeah if you could please identify yourself because we're having a transcript made.

Bill Savedoff: Okay, my name is Bill Savedoff, I'm an economic consultant, I've been working with Center for Global Development for some years on impact evaluations and other kinds of initiatives. And the one question I had is about how – I mean, when you talk about community – government or standards, you're talking about collective decisions about what those standards are going to be and what I – what I'd like you to explain is, how do we collectively decide what is going to be the open source part of this and how do we describe the part that's going to be proprietary?

Because if it's a case where a corporation develops a - Pfizer or a drug company - develops a particular drug and then says we'll license anybody to produce it; they still own the copyright and then over time, if people become dependent on that, they can always pull it back in or I would imagine for – for some of the open source software. So, the question is, you know, the Java's free, okay. The – the keyboard design has to be free on the telephone or not? Where – you know, where does the propriety – proprietary begin?

Sorry, just to – to go back to that example about drugs. I mean, the polio vaccine was developed without a copyright so that's sort of like the example of the R&D and the pharmaceutical world that was open source.

Scott McNealy: Right, so it really gets back to purchasing and the purchasing policies on almost all products and technologies don't contemplate cost C. They – they do barrier to entry, list price, minus discount. They do cost B which is the 5 year net present value of the discounted cash flows of ongoing costs of operation and they ignore cost C, which is the barrier to exit. Now, when you buy a Ford, the barrier to exit cost C is basically 0. You don't have to – if you switch to a Chevy, you don't need a new driver's license, and you don't need to be retrained. You don't need a new garage and you don't need to pick a new workplace, because you can drive it on any street, anywhere.

So, implicitly the cost C, but in technology or in drugs and other things, the barrier to exit may not be 0. In fact, it may dwarf a + b. So all I would suggest is that we at least start putting requests for proposals and, and make purchasing decisions with an understanding of what our a +b + c, not just a + b. And once you do that then you can make an intelligent – I'm not saying there's any specific guideline or rule, but just make sure you're contemplating and with open source, you can be guaranteed that your c cost will plummet to asymptotically to 0 because the on-off ramps are all there, the choice. And the second point I would make is it's really hard to open source something and then pull it back. Once that thing's out – out of the barn and – and somebody's downloaded it under an OSI approved license, it can be awfully hard to get – to – to pull that back and get a court to say, hey this person downloaded it under the presumption that it was open source and now you've changed your mind and you want to sue them for – I – I think you're going to – that – once that rocket leaves the pad, it's kind of hard to get the words back in your mouth. So, I'm – I'm not too worried about that.

Lawrence MacDonald: All right, George?

George Ingram: I'm George Ingram with the Academy for Educational Development and I have a question for Scott and Ellen. And that at a very practical level, what are the first three big steps a government agency has to do to move into open source and to be open – more open to the public?

Ellen Miller: I wish it was as easy as a one, two, three. As we would say -- Virgil and I raised our children together. First there needs to be an attitude adjustment meaning, the government needs to embrace the new technology, the internet, and the notion of open source, as well as the understanding that government data is our data, not their data. I don't know if that's one, two, and three, but those are sort of the, maybe the first steps that have to take place. I am getting increasingly fond of saying that the Freedom of Information Act, which was heralded many years ago as the way government could get our information, is actually backwards. I mean if you think about it very long, what the freedom of information act did, was to require citizens to request information from its government that it should have the right to. The burden of providing information belongs at the government level, not on behalf of citizens. So I think George, first there is that attitude adjustment. The understanding and the embracing of the new technology to display information, and then I think the rest could simply follow by executive order.

Lawrence MacDonald: Executive order to do what?

Scott McNealy: To go open source. Can I do four? One is mandate a balanced budget. When you have a treasury that can print money, you can keep buying stuff that you could get; did I mention free? So you need some real economic motivation to go do that, and right now, the government can always come up with reasons to go upgrade to a new, next generation proprietary environment. Secondly, you need the leader of the government to get on the bully pulpit and say it's okay, in fact, it's the right thing, and to drive popular understanding and sentiment towards this. Thirdly, as I mentioned, you need to advantage products based on open source in the procurement process. And I was writing down the fourth one, and it jumped out of my mind. I can't remember it. If it comes back, I'll remember it later.

Lawrence MacDonald: We're gonna come back and check on that fourth point. I'm sure it will come back. There is a gentleman in the back.

John Richards: John Richards, Center for Study of Responsible ****, question to Mr. McNealy. Do you have sense of what the savings would be to the federal government of using open source operating systems and an open office suite?

Lawrence MacDonald: The headline number, huh?

Scott McNealy: My numbers are off, I'm sure, but you know, at one point I knew that the US government spent about 20-25% of the IT budget in the United States. It's probably not anywhere near that number now, or maybe it is still similar, or maybe even bigger, but it's a stunning number, and how many government employees are there? And buying each one of them a copy of Microsoft Office alone, just think…It's more than the stimulus check that some of you got, annually, or every few years. So it is quite an interesting stimulus that we could give to the economy if you think that was useful. But the real cost, is that the

barrier to exit is, you know, an order of magnitude greater than A+B. You know, I walk in the government data centers, and because of the barrier to exit, it looks like a museum. Most of the computers I see in the US government ought to be hanging on the wall at the Royal and Ancient, along with the Mashie and the Niblick. But you know why? They're stuck. The barrier to exit from…And once you get stuck on Wang computer, or an old DG computer, an old deck computer, how do you get off the old Vac computer onto a new environment. It's very, very difficult. So I wouldn't even hazard to guess, but it's billions, and billions, and billions, and billions to quote Sagan.

Lawrence MacDonald: It sounds like that would be a useful number to get somebody to figure out.

Scott McNealy: I got better things to do than to try and figure that number out, it's just GAZILLIONS! Just quote me on the bloggers, quote me "IT'S GAZILLIONS O'DOLLARS!"

Lawrence MacDonald: I have a question that relates to this idea of an executive order or government policy in favor of open source, and I understand the point about standards. You give a very good example of you know, you can't just see who wins, drive on either the left or the right side of the road, so that point I get. But on the open source, sort of, pro open source policy, it seems to me that if the advantages are as big as you describe, then the market place will figure that out, and other than a standard setting role, that there may be isn't much more needed, or am I missing something?

Scott McNealy: Having studied economics, there is a tipping point with network technologies, that when things tip, the world goes that direction. We have kinda tipped to English, and it's kinda hard to switch. And when you tip to a proprietary environment, it gets very hard to switch. And there's another thing called monopoly power, and that monopoly power is when a certain company has so much market pricing, and market management power, that no single company, or group of companies, can overcome it, and it requires government intervention. I'm a raging capitalist; I'm a wild, crazy, libertarian around government intervention. But at some point, when a monopolist sets in, you can let it work its course out, which could put generations of folks under monopoly stifled innovation and monopoly reds, or you could step in and do that. So I think that when the market tips to a proprietary environment, you got to step in. And the government has buying power, as well as regulatory power to go do that.

Last thing, or the fourth thing I wanted to mention; it came back to me; is, I would put some restrictions on government investment. For instance, my view on H1B visas is, if you come to the United States, and get an education, a graduate education from a US university that receives one penny from the US government, the restriction is not that you get an H1B visa, but that you must stay and work in the United States for five years after you graduate, because my hope is, that you

get married, have kids, and not leave, because we helped fund your education. So the same thing on government R&D. When government does R&D, and you're a beneficiary of that, one of the things you should be expected to do, is put all the related technology into an open source license. It doesn't mean you give it away, it just means you're sharing it, because that was citizens dollars anyhow. The one exception might be some DOD or intelligence community investments, that they don't want to necessarily make open source to the rest of the world, and that ought to be their call. But I would argue that's another way, because of the enormous amount of government R&D dollars, in fact, Sun got started out of DARPA contract at Stanford, to build a Stanford University network, and then Berkley DARPA contracted to do the Berkley operating systems, so we decided to go with Stanford University network, instead of Berkley University network, for obvious logo reasons.

Lawrence MacDonald: Now we're warming up to questions, we're gonna have to wrap up soon. I see two hands, the gentleman here in front, and then Claudia, and then we'll come back to the panel if either of you have concluding comments, and Scott we'll give you the last word.

John Scott: John Scott, Mercury Systems. How do you see the coming budget squeeze by entitlements driving a lot of this in the federal government?

Lawrence MacDonald: Did people hear the question? Is the impact of the budget squeeze on the procurement choices that are gonna be made? Tossing that one to Ellen or Dave?

Dave Witzel: I have no insights on that, no.

Scott McNealy: We have been operating on a continuing resolution, which, I mean it's a little dangerous when they have the treasury in their hands also. They just, one of the interesting things, let me talk about a small subset with **** . Bobbi and I are noticing an enormous interest in India, and in South Africa, and a whole bunch of other places, because, you know what, the US can afford 4.3 billion dollars worth of text books every year. The rest of the world can't. So, some of the ideas we're talking about here around sharing and cost reduction, and security, and all the rest of it. We just handle through just shear ability to go spend our way through the problems. Other geographies are way more excited about we're talking about here, because they just flat out can't afford; and they are trying to get from foot to bicycle, not you know, BMW to Porsche.

Lawrence MacDonald: Claudia.

Claudia: Thanks. I just want to talk about a connection to another policy arena, which is health. I work for the Markle Foundation, and we're really trying to lay out what could be the policies and technology choices for health information sharing domestically, and are really driven by three principles, which I think you'll immediately see the connection to open source. Driving to interoperability,

seeing how policy and technology can't be divorced from each other, and looking at openness and transparency in all our policy decisions. And I think it's clear, that if our goal for instance, in healthcare, is the privacy of people's health care information, and allowing consumers access to not just the information, but the policies; you can't do that if you keep the technology choices secret. So really, if our goal is to drive towards these things in our policy making, in education or health policy, you can't separate the policy choices from the technology choices and hope to achieve these goals.

Scott McNealy: You are too stunningly logical. I couldn't agree more. And the number one component in technology that we're driving out there is identity management. Now there are two components to privacy and security that everybody looks for. One is authentication. That's knowing who is who, so I know if it really is you out over the internet, and then, you got to know what's what. And that is what data is what data, and how has it been tagged, and then you got to know who gets access to what. So identity management is all about who's who, what's what, and who gets access to what. And we have invested enormous amounts of money in building that identity management infrastructure so that you could have online remote tele-distance learning, without losing track of your privacy, and security, and safety. The problem with my medical records is; I can keep them safe at home, but then if I get hit by a truck, and I'm unconscious, that doesn't help. Or, I can put them in some unencrypted file cabinet at my health care provider, who knows who is walking into that office, and rifling the files, they are hardly secure. Putting them encrypted on a network with identity management to provide secure, conditional access seems to be the automatic way to go do that. But again, it has to be based on transparent open trusted, open source technology. We're the only company out there that I know of that is open sourcing a major enterprise scale identity management infrastructure, all the way throughout.

Lawrence MacDonald: Seems like a good closing note, but I did say that I would come back to discussants. Final notes or questions you'd like to add?

Dave Witzel: Well I had one more question for maybe both of them, which is to the extent that organizations and it's not necessarily government agencies, but non profit groups, or foundations, you know, from Washington, you know, philosophically agree with the idea of openness and sharing. How the heck do they get there? I mean, it's kind of a naturally closed environment around here, and sharing; I'd say the watch word. I mean, how do you guys both run open organizations?

Ellen Miller: It's a pretty big question. In the sense, I mean, we've found two kinds of institutions. The newer, the fresher the institution is, the more likely they are to move in the direction of openness; transparency both in terms of its operations, how they do their work, and the engagement of citizens in the making of policy. We haven't actually talked about using the internet at all as a way of engaging citizens in the practice of democracy developing communities. Scott certainly

referred to that. It has certainly been Sunlight's experience that it is a bit of a struggle for the older institutions, the NGOs that even deal with data and information. And if that's a struggle, than the institution of government, and particularly the Congress, is even more of a struggle. As I said earlier, at the beginning, it is a cultural challenge, but my sense is that if government doesn't do it, then the non profit sector will do it to them, in the sense of digitizing existing records, creating a demand for the public, who now is accustomed to going online to making their plane reservations, ordering their books, buying items on eBay; they want government information in exactly the same way. So the demand for change probably will come from those citizens in those communities that we create. Just in closing, I would say that information is the currency of democracy, and in the 21st century, it now means something radically different than it has ever meant before, and that is Sunlight's position; to try to bring these communities together to bring government into the 21st century, and make the information that it holds, that is so incredibly useful and necessary for citizens to be there, and the most open and transparent, and did I mention, free?

Lawrence MacDonald: Thank you Ellen. Scott, final word.

Scott McNealy: I think Ellen is right on, and it reminds me of the famous country and western song, sometimes you're the windshield, sometimes you're the bug. And, you just got to decide whether you're going to kind of hang out where you are and wait for a windshield to come up and hit you upside the head. And the happened to World Book, and that happened to you know, the card catalog, and you know, the publishers of eBay took on, and took out the classified ads, big time, on a whole bunch of newspapers, and bloggers are taking out the reporters. I mean there is a lot of disintermediation going on, and open source is going to disintermediate a heck of a lot of folks, and it's going to sneak up on them. So, my suggestion is, if you want to compete, you better become a windshield, and start traveling at high speed, and get out the Windex, as there is going to be a little problem here and there, but that is the right way to go.

We had…I'll leave you with one last story. We had an executive advisory counsel meeting in northern California, and we brought in a bunch of our big customers. On one side of the hotel, we had the traditional CIO types from big government, from big industry, big Telco, all the rest. On the other side, we had the Web2.O gang; the Facebooks, the MySpace's, **** the twitters, and you probably haven't even heard of a lot of these names, because you probably don't hang out, and you know, publish your entire life as a digital tattoo for the rest of the world to see. You are SO last millennium! But, we went in and asked this group, "What are your big software suppliers?" they said, you know, "Oracle, SAP, IBM, and Microsoft, every one of them, you know, we spend all our money with those folks in huge barriers." We went over here and asked the Web2.O gang, "Who do you spend your software money on?" Not one of them spent a penny. Not one of them even had a license, other than a click, open source free license for anything that they ran all of their websites on. If they did, they

certainly wouldn't admit it to the rest of the crew. But that is the generational thing that is hitting the world so hard. All of the new start ups, would never go to the venture capitalists and say hey, "I need money to go buy an Oracle license." Ain't gonna happen. They aren't gonna spend a penny. Which is why we are doing 70,000 downloads of MySQL everyday. Now that gives us a hunting license to go sell servers, and storage, and services, but, you know, my view is; the pricing model and the openness model is going to be driven by an understanding that the products tend towards the marginal cost, and certainly with software, and music, and other things. If the marginal cost of manufacture is zero, the marginal cost of distribution is effectively zero, and with community development, the marginal cost of engineering is plummeting, and by the way, look at all the movies that are being made. What's the marginal cost of doing your own home video? Basically, nothing. And everybody is watching YouTube. And the kids don't watch TV, they're watching YouTube. And the price of that tends to zero. And that's when you need, and in fact, can ride the open source models, and you better figure out how to…I mean, free, is the new number out there on the internet, it's the new black. So, you know, people better figure that one out, and I think governments and NGOs ought to ride the wave, instead of standing there in the surf, trying to take the pounding of free wave after free wave. And that's what the world is all about.

Lawrence MacDonald: Scott, thank you so much. And I think the challenge for us in the development policy community, is what does this mean for us? But it clearly means something, and thank you very much for joining us today.

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