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P R O C E E D I N G S

MR. ANTHOLIS: Good morning. Welcome to everyone. I'm Bill Antholis. I'm the managing director here at Brookings and I'm delighted to welcome you to the first inaugural Taubman Forum thanks to Al Taubman and his wife Judy, daughter Gail, who are here today. This is a terrific new series that we're launching here at Brookings. And as the name Brookings itself suggests, this institution couldn't be possible without the support of farsighted philanthropic leaders who understand the importance of solid public policy research and the ability to have impact. And, in fact, also here today is Ezra Zilkha, one of our trustees who has endowed a chair in governance studies, the Ezra Zilkha chair, which is one of our most recent and most important chairs held by Bill Galston.

For those of you that know Brookings and have spent any time on our website, we are quite proud of our core values of quality, independence, and impact. And today's session I think really speaks to all three of those. Certainly, the quality and independence of the research that Darrell and his team in governance studies have done across a range of issues, particularly on technology policy, which has become a real centerpiece of their work on understanding where this revolution in our economy is taking our governance. And I think those of you that know Darrell and his colleagues' research would speak to the quality and independence of what they do, but also to the impact. Since the inception of the institution, but particularly in recent years, we have put greater emphasis on a number of elements of impact. Technology is certainly a part of that, but convening and doing things in person is also pretty important. And the fact that all of you would come out today for this I think speaks to that as well. And not just coming together, but talking to real important policymakers, both in government, in Congress, and in industry, which we've also done today.

And then just also a plug on the impact side. Darrell has a new book coming out on immigration policy which has connections to this set of issues called *Brain Gain: Rethinking U.S. Immigration Policy.* It's the second in our new Focus Series which are shorter, more accessible books on big issues of the day. And we're thrilled at Darrell's new offering which will be on the bookstore shelves in the coming weeks.

The subject of today's forum, technology policy, is a key element of one of our priorities at Brookings. We have just finished a new strategic plan and the first of our four all Brookings priorities we call them because they draw from all of the research programs across the institution, is called Growth Through Innovation. And it's clear that technology innovation infuses American efforts to try to recover from the current economic downturn and to grow out of it and past it. But tech innovation isn't just limited to economic growth. It actually cuts through all of the other priorities that we have here at Brookings.

Energy and climate policy, we were just talking earlier before coming out here today about the advancements in the smart grid and how that will lead to greater efficiency in our way towards a more energy independent and low carbon economy. Opportunity and well-being, issues of access and attention to technology issues for people all across the socioeconomic spectrum is a critical part of advancement. And then also global change, both the opportunities and downsides of technological innovation around the world from the opportunities of distance learning to the security advances that lead intelligence gathering and drones, but also to terrorist groups that use the Internet and other technologies to advance their causes and how that's a security concern that all of us need to pay attention to.

So the issues that we're looking at today are really at the cutting edge of the full range of public policy issues facing the nation and the world. We're thrilled to have the members of the administration and Congress and industry that are here and are going to be

speaking with you today, but also to have all of you here, an audience that comes from the nongovernmental community, industry, embassies, and congressional staff.

So with that, I'd like to turn it over to Darrell West, who will be leading our efforts today. (Applause)

MR. WEST: Thank you, Bill. I, too, would like to welcome you to our inaugural A. Alfred Taubman Forum here at Brookings. And this series has been established through the generosity of A. Alfred Taubman. And Al and his wife Judy are here today with us this morning in the first row, along with Al's daughter Gail, their son-in-law Michael, and Judy's daughter Tiffany. So please join me in expressing our appreciation to Al and his entire family. (Applause)

Now, our goal in this annual forum is to bring together leading experts to discuss difficult public policy challenges. The United States faces major challenges in education, health care, the economy, energy, and foreign policy. We have high unemployment, huge budget deficits, and major problems in terms of a variety of different areas. In our first forum we decided to focus on a topic with the potential to make a huge difference across a wide variety of policy areas and that is science and technology. Brookings has just established a new center for technology innovation, which I will be directing, and it will look at ways to boost innovation and to use technology to improve health care, education, energy efficiency, public safety, and public sector performance. We plan to undertake research in these areas, convene public and private sector leaders, and make recommendations on what we think we can do to improve the climate for science and technology in the United States.

And we're launching this center because we think it is a crucial time in terms of our country's economic development. For a long period of time America has led the world in science and technology innovation. Technology has created jobs, improved

prosperity, and led to new solutions to pressing problems. It helped our nation after World War II become the dominant economic power. It made the United States the great nation that we became. But yet now there are troubling signs of a downward trend in American innovation. Last year, for example, was the first time that non-U.S. innovators filed more patents than did Americans. That had never happened before. The United States, also, some people fear, is falling behind other countries in the percentage of gross domestic product spent on national research and development. There are some who are concerned that we are losing our edge and that therefore future generations will not experience the same level of prosperity and opportunity that many of us have had.

There are some promising signs. The House, for example, just passed the America Competes Act designed to increase money for research and innovation. And we will keep our fingers crossed that the Senate will follow up on that, although we all know it's always a tricky relationship over there in Congress. The administration also has ambitious plans that several of its advisors will talk about today in terms of what it wants to do to boost technology innovation.

So to discuss the future of science and technology today we are bringing together a number of different experts who will offer their thoughts on our current situation and what needs to get done. Our first panel is going to outline the administration's new vision for technology innovation. And we're delighted to have three of President Obama's top advisors with us. They're going to give us a state of the union on technology policy.

The first person I'd like to introduce, and he can come up and join me on the stage, is Aneesh Chopra. Aneesh is the U.S. chief technology officer. He also serves as assistant to the President and associate director for technology within the Office of Science and Technology Policy at the White House. He works to advance the President's technology agenda by developing new ideas and encouraging government-wide

coordination. And prior to this position he served as the secretary of technology for the Commonwealth of Virginia.

Our next speaker who can also come up is Vivek Kundra. Vivek is the U.S. chief information officer in the Office of Management and Budget at the White House. And in that position he has worked on a variety of issues, including strategic planning for IT investments, the oversight of federal technology spending, data transparency, the IT Dashboard for Federal Agencies, and cloud computing, among other things. Prior to joining the White House, Vivek was the chief technology officer for the City of Washington, D.C., and assistant secretary of commerce and technology for the Commonwealth of Virginia.

Our third panelist is Phil Weiser. Phil is senior advisor at the National Economic Council in the White House and director for technology and innovation. Previously, he was professor of law and telecommunications at the University of Colorado. He is a co-author of *Digital Crossroads: American Telecommunications Policy in the Internet Age,* and then also telecommunications law and policy. He's also the author of a Brookings monograph, so it's nice to see a Brookings connection here, entitled "The Untapped Promise of Wireless Spectrum," which was published a couple of years ago.

So what we've done is to ask each of them to offer their thoughts and then we will have time for a short question-and-answer period. So with that, I will turn it over to Aneesh. Thank you very much for joining us.

MR. CHOPRA: Thank you, Darrell. It's a real pleasure to be here at Brookings. And on behalf of the three of us I want to extend my heartiest thanks to you, Mr. Taubman, for the lecture series that allows us to be here and provide for you a little bit of a window on the administration's commitment to technology, data, and innovation, both in terms of its prospects for economic growth and in terms of its ability to empower everyday Americans.

What we'd like to do today in the spirit of the President's call for more collaboration is provide for you a holistic approach to these issues from the perspectives that we all bring: I, as serving as the nation's chief technology officer; Vivek as our chief information officer; and Phil bringing the technology and innovation policy perspectives within the National Economic Council. This morning we'll each be providing for you the foundation of our technology policy and look forward to engaging with you on questions as the time arises.

So let's begin with a bit of the background. We have a colleague in the administration. Her name is Katie Stanton. She now works in the State Department and she joined the administration from Silicon Valley where she had worked at Google. And she remarked to us early in her tenure that there seems to be a big culture gap which we acknowledge and wish to share with you today in graphical form. The culture gap that we experience as individuals -- you saw earlier, I believe, the use of the iPad for the communications notes. As consumers we have embraced all of these emerging technologies in record numbers. And in a sense our society has emerged to a culture where we are celebrating the fact that there's an app for that. In light of yesterday's announcement of the new iPhone, we celebrate that culture. But in Washington, we still reside in an environment where we believe that there should be a form for that. And as you can see graphically depicted, if you can attempt to see at least, you'll see what's an operational file cave that's in the mountains of Pennsylvania. This file cave contains the records for all federal personnel and it's run by the Office of Personnel Management. What's not so exciting about this graphic is that there are countless other examples of rooms throughout the country that are actually in some cases fire marshals have been brought in because the weight of the rooms are so great given all the paper that's stored.

This culture gap is an issue that the President tackled literally on day one,

his first full day in office, when he issued a memorandum on openness and transparency in government where he called for a set of recommendations that embodied three principles that are near and dear to his heart. That is a government that's more transparent; a government that's more participatory; and a government that's more collaborative in the execution of public policy. These are the principles that we used as we came into the administration to think about the role that technology, data, and innovation might play to close this gap and to ensure that we're delivering a government that works.

MR. KUNDRA: And to feed into the cynicism that the American people have about their government, think about what we do as consumers, whether it's booking a flight online or making a reservation at our favorite restaurant or sharing pictures around the world. Yet, when we deal with the public sector we have to stand in line, wait on the phone, or show up with a form filled out made out of multiple pages. Now, part of what we're trying to do in the administration is look at how we're spending information technology dollars. And it's not due to a lack of investments in public sector IT. Over the last decade we spent over $500 billion in information technology.

Yet, as Aneesh pointed out, there's a huge gap between the experiences society has in the consumer life versus interaction of the public sector. That is why one of the first things we did, consistent with the President's vision, was to actually launch a dashboard that would shine light into every single investment in the federal government. And not only that, but we decided to put up the picture of every CIO right next to the IT project that they're responsible for and where it is in terms of cost, where it is in terms of schedule. Then what we did is we stood up a model where we were actually creating an office of analytics where we would analyze these investments across the board because it wasn't sufficient just to shine light on billions of dollars of federal IT spending.

Analyzing these investments, what we began to do was conduct these

TextStat accountability sessions. And these sessions are rooted in what has worked in the laboratories of democracy which is at the state and local level, whether it was the CompStat model in New York City or the CitiStat model in Baltimore or the CapStat model in Washington, D.C. Literally, within 60 minutes what we do is we bring in the responsible officials within agencies and all the parties within the White House to focus on these IT investments to make sure that we're relentless in terms of making sure that we're advancing the interests of the American people. Already what we've been able to do at the Veterans Administration, we hope that 45 IT projects out of which we terminated 12 of those projects, and redeploy that capital towards the most efficient.

In a TextStat session we did with the SBA, we found out that the Small Business Administration was paying $1,614 per Smart Card. And this is an identity card that's used within the federal government. Yet, the same exact card cost $240 at GSA. And we immediately halted that investment and said, look, we need to redeploy this capital where it's most effective and make sure that we're spending taxpayer dollars more effectively.

Across the board what we're trying to do is make sure that we close this gap between how the American people interact with technology in their personal lives compared to how they interact with the public sector.

MR. WEISER: So there's a great Yiddish tradition of let me say a few words before I speak. (Laughter) And there are a couple of words I do want to say here.

First, again, thanks to Brookings. Darrell's understanding the importance of that Hamilton Project paper I worked on. It's the first time I met Aneesh, by the way. And that's been a great partnership and a good friend. I do owe that to this institution.

Secondly, Jason Furman, who helped bring over the NEC. So Brookings' role in helping to convene and bring people together is something that I personally am grateful for. I also think forums like this and the support that the Taubmans are giving for

technology innovation policy really matters because a lot of people don't take as much time to step, look at the big picture, to think about ideas, and that's where a lot of great ideas come from. And one thing that this slide underscores is the Bill Joy aphorism, which is the smartest person about your organization is probably not working for you. And often we get stuck in different silos. And what both Aneesh and Vivek are doing at different fundamental and profound ways is trying to take a new look, bring innovative thinking into how government does its important work. And with respect to public policies, like the Healthier Choice eating -- and in terms of health and wellness, my wife is a health care researcher. She's underscored this point. If we can eat healthier as a country, the impact on our national well-being is enormous.

I don't know if people saw the New York Times' article about women who are obese and the impact that's having on pregnancy. So eating healthier is something that's critical to our country's future. And using technology and the sort of apps for healthy kids here is a pretty powerful tool to engage children and to think about their choices for eating healthier in a, you know, fun way that may work a little bitter than the nudging that parents often do in this regard. And as a parent of young kids I think all three of us have this experience. My six-year-old has yet to start getting into the apps for the healthy kids, but I look forward to that. And just to get a sense, I don't know if people here appreciate that the judges who came to this competition -- does anyone here -- I'm not sure people will admit it -- play Farmville? (Laughter) I didn't think anyone would admit it. Has anyone here heard of Zynga? (Laughter)

So people here aren't admitting it, but there are actually millions of people who are playing Farmville and other Zynga games online. This is an incredibly powerful medium. Getting people who are using this medium to think about, you know, core public policy concerns is a critical challenge. Getting outside ideas in is a critical part of the

administration's effort.

MR. CHOPRA: So what we've just done in the beginning here is provide for you the context for how we are trying to instill greater trust through technology, data, and innovation in the workings of government.

What we'd like to do at this point is transition into a conversation about the long-term economic prospects for the country. As Darrell had mentioned, we believe that technology can be an important infrastructure component in our goal towards long-term sustainable economic growth and quality jobs.

What we'd like to do in this slide is to provide for you the President's overall framework for economic growth with particular emphasis on the role that technology is playing in that regard. This is going to be another Q&A session if I may.

How many of you by a show of hands had seen the President's strategy for American innovation that was released in September? Excellent. Good for all of you.

MR. WEISER: By the way, this is a great audience. More people have seen this slide than play Zynga games.

MR. CHOPRA: Yeah. There you go. (Laughter) Hey, that's terrific. Great insight.

What I'd like to do is put the strategy in the context of how -- the role that technology would play in this regard. And we're going to spend a few minutes on each of these pillars in this next round of conversation.

For those of you that are following the President's strategy, it begins with the acknowledgement that our nation is at its best when we invest in the building blocks of innovation. And the building blocks of innovation include a commitment to research and development investments, a commitment to ensuring we have an advanced information technology ecosystem, and a commitment to ensure that we have a workforce

commensurate with the 21st century's needs -- one that is much more focused on science, technology, engineering, and mathematics. So what I'd like to do is provide for you a little bit of context around the building blocks. We'll do that in a moment.

Second, we have a similar commitment to ensuring that we have a functioning, open and competitive marketplace, one that's focused on productive entrepreneurship. Here, we'll be very focused on the role of open government, in particular as a catalyst for spurring -- empowerment, if you will, of everyday Americans. The comment that Phil had just referenced, the notion of our prizes policy to bring outside ideas in -- in that case, to help develop applications to inform folks about the nutritional values -- is just the beginning of a larger conversation. You'll hear more about our brooder set of policies in this domain in the slides that follow.

And then last but not least, we'll come together as the President has called for on a few issues that really require an all hands on deck approach. That all hands on deck approach today has been really focused on ensuring we've got a commitment to a sustained clean energy technology economy. And you'll see a lot of work that we're doing in that regard. A focus on bending the health care cost curve using information technology, and on addressing the grand scientific and technological challenges of our day.

So with this framework, let's now dive into each of these building blocks, beginning with how we're using emerging information technology infrastructure in the government itself.

MR. KUNDRA: There's one area that I spoke about last time I was here at Brookings, was cloud computing. If you look at the cost of compute power, coupled with the ability to access bandwidth across the country, what's emerging here is a very interesting one-way street in terms of how we're going to be leveraging technology in the coming years and the coming decades.

Across the federal government, unfortunately, what we've done is we've made investments in technologies of yesterday. For example, since 1998, what we've seen is a number of data centers grow from 498 to over 1,100. We keep laying infrastructure, building buildings, buying computers that are used, at best 7 to 10 percent in terms of processing power. Yet, what we're seeing in some of the most advanced countries across the country, is leveraging the power of cloud computing. A company called Animoto, for example, which stood up a solution that would actually allow you to create literally your own MTV channel, sharing video and data and content, essentially allowed thousands of consumers to be able to share real-time video and animation. And they didn't go out there and spend millions of dollars building infrastructure. What they did is they leveraged the Amazon cloud platform. And what that allowed them to do was scale very, very fast.

In the same way in the public sector, one of the interesting areas that we're pushing very had on is actually a shift towards cloud computing without compromising national security or the privacy of the American people. In the same way that every house used to have a well or you used to have an engineer dedicated in every company to maintain electricity, now what we're looking at is the ability to actually leverage whether it's electricity or water through utilities. We see a world where the cloud is going to serve as a utility for compute power. Couple that with mobile computing now, all of a sudden you have a very interesting world. You have more power in your hands, whether you're using an iPhone or Android or an iPad that it has more computational power than the earlier missions we sent to the moon in terms of the technology that was baked in across the board.

So what we're seeing is the ability to have massive innovation. Somebody with a great idea doesn't have to invest heavily in infrastructure, but the power and the force of their idea can transform the world. In the same way in the public sector we're making investments across the board, whether it's at Health and Human Services in electronic

health records or its NASA looking at scientific computation, or Department of Interior. Simple things like e-mail and literally figuring out ways in which we can shift power to the end-user.

MR. WEISER: So the cloud computing infrastructure that Vivek has just talked about rests on broadband connections. And broadband is one of the great infrastructure challenges of our time. It's one of the great enabling technologies with enormous opportunity. For people that have broadband technology, lots of opportunities are at their fingertips, whether it's education, health, entrepreneurship, commerce, culture. And so enabling lots of people in all parts of the U.S., getting as many broadband connections deployed and adopted as we can, is a crucial challenge for the administration. This is something that there is a lot of focus on, and we are looking to celebrate, encourage, and look for all sorts of solutions to this challenge. It's not like there will be a one size fits all. One that merits note here is a project that Case Western is working on as part of a partnership with different stakeholders and universities to get one gigabyte connections. Now, this is a lot of bandwidth. Different people have different sorts of questions. How much actual use of this. And the good news is we'll find out. Google has got a project now also to deploy enormous amounts of bandwidth. There's lots of discussions to how much is enough, and this is going to be something over the next years that we're going to find out. The past, if it's prologue here, I think there was a famous quote about Bill Gates saying we've got more memory in this computer than anyone will ever be able to use. There was constant people being surprised. And that's something that may happen in broadband, too. We'll see.

There's a huge opportunity to look for strategies to get broadband deployed and adopted, and we don't know what's going to happen with it. I think we do know from what we've seen already that broadband is a transformative technology. The cloud

architecture is one exciting application that we're seeing, and we're likely to see others. And this is something that we're going to continue to be focused on. Obviously, the Recovery Act put down a real down payment in this regard, and the FCC is looking at a longer term strategy for university service reform. And it's an issue that we will continue to be addressing going forward.

MR. CHOPRA: Which leads us to the third pillar of our infrastructure challenges, the building blocks of innovation. And that is our commitment to research and development. Now, as Darrell actually mentioned in his opening remarks that there has been an ongoing debate about the health of a nation's competitiveness in part driven by its share of gross domestic product contributing towards research and development. I believe you made reference to that statistic. President Obama, in his speech to the National Academies of Science a little over a year ago challenged this nation, public and private sector, to achieve a three percent investment ratio of our nation's GDP into research and development. The public sector commitment to this regard has been an America Competes Act commitment that have called for the doubling of basic science research and development within three key agencies -- the National Science Foundation, the Department of Energy's Office of Basic Science, and the National Institutes for Standards and Technology, as you can barely see.

By the way, all these slides that are really hard to see we're going to make available online. I suppose Darrell will have it posted. So we can get you copies. Forgive the fine print. But we'll be describing for you the slides as we're doing our remarks this morning.

The commitment here, as you can see from the graphic, has been in the President's fiscal 2011 budget. Building on the dramatic investments in research and development that came out of the Recovery Act, which put us back on track towards that

doubling trajectory, followed by the commitment in the Fiscal 2011 budget to continue that great work. By the way, in that budget, which now is an aggregate that is not just these three agencies, but an aggregate, about $150 billion for research and development spending, but half of that is in the Defense Department and the other half across the rest of the agencies. The United States government is equally committed to a focus on translational capacity. How might we increase the rate at which those ideas born out of our universities and federal labs translate into the commercial marketplace?

And to that end we were pleased to announce just about a month ago under Secretary Gary Locke's leadership of the Department of Commerce, a new innovation competition. We call it the I6 Challenge. Opportunities are still available for anyone to participate. The I6 challenge in short asks communities around the country for the best ideas on how they would build capacity to listen to the ideas for universities and federal labs and to translate them in a more effective manner into the private sector. Those resources that the Economic Development Administration has made available in our spirit of collaboration are going to be matched by commitments at the National Institutes of Health and the National Science Foundation to provide supplemental resources in those communities that have research centers of excellence in that regard.

The I6 challenge is just yet another modest step forward as we commit to this effort of translation capacity. We are taking a listening tour around the country. It began in February, where Secretary Locke and I had participated in a commercialization forum hearing from university presidents and stakeholders. We'll be visiting across this summer a number of key sections in the country, from Michigan to California and elsewhere, to hear directly from the American people on what we can do to better connect our research assets and our economic prospects for growth.

MR. KUNDRA: So one area I'd like to talk about is an initiative that we

launched called data.gov. And it's grounded in a very simple philosophy. And the philosophy is based on the President's Open Government Directive that information that the American people have already paid for should be available for free. It should be available online. And we also recognize that the federal government does not have a monopoly on the best ideas. And that the best thinking isn't necessarily within the four walls of Washington.

To that end, last May, in 2009, we launched data.gov with 47 datasets. Today we have over 270 datasets on data.gov.

SPEAKER: Thousand.

MR. KUNDRA: Sorry, 270,000 datasets on every aspect of government operations, from health care to environment to education. And part of what we've been able to do with this platform is we've been able to spur innovation in ways we couldn't have even imagined. Since launching this platform, what we've seen is third parties create more value than we could have imagined. They are finding value at the intersection of multiple datasets. A team of eight students led by a professor at RPI, without the government engaging in any formal partnership, went out on their own and built over 40 applications on every aspect of government operations from looking at U.S.'s spending, to who was actually visiting the White House, to figuring out, you know, what innovative application would serve the American people. A developer who built a simple application called flyontime.us that actually allows you to see what the wait times are at every airport in the country by using Twitter feeds, to data that they used from the FAA on average delay times across airports.

We've also seen this model being scaled at the city-level from San Francisco to Boston; internationally from the U.K. to Australia to the World Bank. There's a global movement now to democratize data, and it's grounded in something else that's happening in the private sector. Think for a second the power of platforms. Apple didn't go

out there and build hundreds of applications. Today, the iPhone has over 200,000 applications. It wasn't Apple that actually built those apps, and some of the favorite apps I have were built by developers all over the world.

Think about YouTube. There are over 24 hours of video uploaded on YouTube every minute. And that content isn't created by Google. That content is created by people like you and myself. In the same way, the data.gov platform has the potential to fundamentally transform our economy in the same way that GPS did when the Department of Defense decided to democratize data on satellites. We couldn't have imagined the day when we could use our PDAs to navigate a whole new city or go to a rental car store and rent a GPS device for under $10. We hope, and we're already seeing, massive innovation happening outside the four walls of Washington as a result of this administration launching the data.gov platform.

MR. WEISER: So as you've seen, there's a very fine balance and complementary relationship with the role of government leadership and public policy and private sector innovation in what is undoubtedly the worst slide of the deck. This one right here. (Laughter)

I take responsibility, although part of it is the domain of standards. You can see Pat Gallagher, who -- for people who don't know Pat, he is an amazing public servant who has worked his way up from NIST. Jonathan Sal, who is in the back of the room, worked on the transition, helping to work with NIST and identify Pat as someone who is an extraordinary leader of an agency that is one of the sort of underappreciated parts of government. The role of standards is also underappreciated because often it's something that's ethereal and hard to sort of get excited about.

To give you a little bit of my basis for excitement, TCP/IP, the standards that created the Internet, was in part because there were some very thoughtful people about

how to approach standards at the Pentagon. And Vince Cerf and Bob Kahn were two of those involved in that enterprise. We don't always have the luxury of having extremely thoughtful people about standards at all the agencies. And one thing that having a niche in the role of chief technology officer is already delivering great benefits is to empower, build up leaders at agencies.

So for those who haven't heard about Todd Park at HHS and what he's doing -- I don't mean to steal your thunder, you'll get to it -- it's nothing sort of extraordinary. And so a challenge that we all have is the investment of human capital, the investment of ways of approaching the work of government so that we are institutionalizing levels of awareness that may not exist.

Now, there is a very important protocol in a different use of the context. Not necessarily technology, but how government operates, in an OMB Circular A-119 which commits to the approach of voluntary consensus-based standards. And that's something that the U.S. Government has really been a beacon around the world because many governments for a long time had the view that government should be setting standards. And this you could say issues a prime directive, which says, no, governments should not be issuing standards; governments should go to the private sector, should maybe play some role convening, but certainly should play a role of establishing a public policy priority and allow private sector innovation in an open fashion to help develop the technology. And that is indeed the approach set down to 119-A.

However, the infrastructure throughout government doesn't necessarily exist at the highest levels so that sometimes people may not realize what is the standard setting problem and how to go about doing it? And so to address that, Aneesh helps spearhead and I'm working with him along with Kasson Steve from OIRA, an approach to an interagency standards process being led by Pat Gallagher. And this is to in a sense create a

playbook so that we invest in the government awareness and approach on standards so that we're able to replicate the best approaches of the past and avoid of what has been some of the more ignominious failures in standards policy.

MR. CHOPRA: To round out our conversation about openness and competitive markets, I wanted to share with you our attempt to convene and spurn entrepreneurial activity without taxpayer dollars at the center. In fact, without taxpayer dollars at all. And this is the story of our most recent endeavor in the Department of Health Services announced by Secretary Sebelius on June 2nd. And that was the launch of our community health data initiative and, more specifically, the Health 2.0 Developer Challenge.

A word about this in context. As part of the President's first full day in office, Memorandum on Openness and Transparency, which led to the development of data.gov and some of the conversations we've had about transparency. The President called on each cabinet secretary to publish in his or her own words how they would embody the principles of transparency, participatory democracy, and collaboration. Everybody took their own approach in the spirit of instilling the culture change we need to see in Washington, we designed it in that spirit.

And Health and Human Services under Secretary Sebelius -- and by the way, you can look at any one of their open government commitments by going to the agency website /open. So in this case hhs.gov/open. Secretary Sebelius said, folks, the mission of the Department of Health and Human Services is to improve the health of the nation. It is not necessarily just about the provisioning of insurance or various investments in biomedical research. Those are all strategies and tactics against the broader goal, which is to improve our nation's health. And it turns out that we have literally thousands of datasets focused on the health performance of our country at the community level.

How many of you know the smoking rate in your community against the

smoking rate in a neighboring community? Or the infant mortality rate? When we have a debate in our communities at the local town hall, how informed are we about the actual performance of our community on a whole range of these indicators? Well, the reality is that information exists in file cabinets or in reports, but they're not accessible in a way that actually informs a lot of the public debate.

So Secretary Sebelius said what I'm going to do is three things. Part A, I'm going to organize all of this information. Part B, I'm going to convene or in our technical speak, a mash-up of public health professionals and techies to see what happens if we bring the two of them together. And C, unlock this potential, tapping into the creativity and the entrepreneurial energy of the country by building a national grassroots movement to improve health performance powered by information.

How have we done this? On March 11th -- literally, March 11th, at the Institute of Medicine we had 25 public health professionals. People like Don Berwick, who the President has now nominated to run CMS and 25 web 2.0 experts, people like Tim O'Reilly, who many of you know as the father of the term "web 2.0." And literally brought these folks together who had never met before and asked them over the course of one day to outline a set of challenges that we could see some application development around to close that gap. They identified a dozen, maybe two dozen ideas and we issued a very simple challenge. In three months, Secretary Sebelius is going to want to see what you all have done. Not a meeting to have a meeting about a meeting to have a meeting, but to prototype applications that are developed across the next 90 days, born out of the information that we made available that day.

Oh, there's no procurement. There's no money. There's nothing. There's just calling on your entrepreneurial spirit and energy in advancing our nation's health performance. And folks stepped up to the plate. We showcased on June 2nd nearly 20

applications that were new or improved by our provisioning of health data. Just two simple examples and then I'll shift to our last priority.

Example number one, Microsoft Bing. Microsoft has a search engine that more people will use than would probably visit a government website. And if you type in a hospital, like New York Presbyterian Hospital in Bing's search engine, today the default results page will incorporate the quality data from hospitalcompare.gov, a website built several years ago that capture information about patient satisfaction and quality performance.

Now, I don't know how many of you -- okay, here's another test. How many of you have been to hospitalcompare.gov? More like the Zynga thing; not many. A couple. (Laughter) But how many of you have been to Bing? More, right? There you go. So the point is we don't have to have you visiting the government website. We don't need to chest thump that our websites are better than anybody else. That's the wrong approach. The right approach is we release the information and you have it in your way.

The second example of this phenomenon was an entrepreneur who lacks broadband Internet access because he lives in rural Wisconsin, who used to drive 45 minutes just to have his office set up, said one of our challenges in health is that asthma attacks come and we don't have the information about when there's an attack or when the weather changes that we put ourselves at risk; high rates of emergency room visits and the like. He built a very simple technology. A sensor that sits on top of inhalers, so people who volunteer to do this, when you subject your inhaler to your compressor it records the time and location of that compression. So you'd have real-time public health surveillance maps. So in collaboration with the Centers for Disease Control, he's supplementing public health data with almost real-time alerts so that people can be forewarned if they opt in, all with privacy protections. This solo entrepreneur, who didn't have a big, fancy RFP-generating

machine, just said, hey, I want to help and do this.

The Health 2.0 Developer Challenger is our statement for how we will convene this grassroots movement for change powered by data, informed by emerging technologies, and calling on our best angels in our country to step forward and make a difference. And some of these ideas are going to commercialize and make money; others are going to be available free of charge. That's the spirit of how our open government philosophy, we hope, will empower everyday Americans and address the economy.

Our last pillar before we close out for questions is now how we think about this construct in the notion of our national priorities and breakthroughs that we need to convene. As I transition to Vivek on this last slide, the last set of slides, I remind you in that strategy for American innovation the President had a very specific chapter dedicated to grand scientific and technological challenges that we as a nation should address, challenges like how we can produce solar cells that are as cheap as paint or if we could produce prosthetic devices that would allow a double amputee returning home from Iraq or Afghanistan to once again play the piano. These scientific and technological challenges we wanted to get public input on and here's the results.

MR. KUNDRA: So as we try to catalyze breakthroughs when it comes to our national priorities, it's not just important what those breakthroughs are and the information that we've collected, but it's also how we do that.

To give you an example, as we were looking for public input we went down the traditional approach, which was to post a notice in the *Federal Register* over a six-week period. And we didn't receive as much input as we would have liked to. In the last 48 hours of the deadline what we decided to do was to actually leverage new media, to leverage the platforms that are native to the American people, from Twitter to Facebook to a number of other platforms. And what was fascinating is that in the 48-hour period we got over 1.5

million people engaged in this process to give us feedback. We've seen this across the board. For far too long what we've relied on is platforms that we've built that are limited to a small set of people inside Washington. And part of what we're trying to do in the administration across the board, the philosophy of the Obama Administration is to shift power to the American people, whether it's with data.gov, whether it's the way we go about getting input from the American people, recognizing as I said before that we do not have a monopoly on the best ideas. We saw that with the Save Award, which was an award for the best ideas in the public sector to save money. We got thousands and thousands of ideas across the country from people all over the federal government coupled with third parties that were giving us input in terms of how the federal government could actually be more efficient and effective in terms of how it spends money by cutting waste. And we've implemented a number of those ideas in the budget itself.

So what we're seeing is a fundamental transformation of society, the use of technology. People can engage with our government in ways that were structurally impossible before. Whether you're in the suburbs of Washington or you're in Ohio or in Boston, you for the first time have access to your government in ways that were impossible structurally before. And what this administration plans to do and will continue to do is leverage the power of technology in our policymaking process and also in terms of how we try to solve some of our grant challenges, whether it's in energy, education, health care.

MR. WEISER: So, in energy, and clean energy more particularly, we have a huge national opportunity and obligation. And one of the most promising clean energy technologies is energy efficiency. And there are still vast untapped opportunities to enable all Americans to use energy more intelligently and more self-consciously. And so bringing the power of information technology to people's, in some cases fingertips -- there's an app for that -- is something that the smart grid revolution is looking at. And we as administration

are committed to using this opportunity in the most effective way possible. To that end, working with Aneesh, the folks in the Council of Environmental Quality and also at OMB, we're setting up an interagency effort around smart grid to look at what a comprehensive policy framework in that space is going to be. And at the end of September we will have completed our investment through the Recovery Act of around $4.5 billion into this technology. There's ongoing good effort by NIST, helping to develop a standard architecture for smart grid. And we have to look forward in this area, understand better how consumers interact with this technology, understand where the best opportunities are, and we were very grateful to Brookings for hosting a session here that's going to be in mid-July -- July 14th ¨ to talk about smart grid policy after the Recovery Act. And that's going to be part of our efforts to work through what is a very important challenge of our time.

MR. CHOPRA: A few more, just a couple more. Darrell, I know we're running a little behind schedule. Forgive me for that.

I want to take that same spirit, our attempt to bring innovation in the smart grid, to our health care sector with just a set of observations about the role of government in spurring change. As you may recall, in the Economic Recovery Act, the President did commit some $20-plus billion to support providers, that is hospitals and doctors, who can achieve the notion of being a meaningful user of health information technology, to lower costs, improve quality, and increase patient satisfaction. There has been a public policy debate about what it is that we can do to be defined as a meaningful user of health IT. And commensurate with our policy debate about that question has been a technological evaluation about what we can do to spur those kinds of breakthroughs.

If you look at the background, the American economy has seen productivity gains in nearly every sector, but the health care sector, much like the public sector, has really lagged behind in productivity gains. So here are just two examples of policy outputs in

the technology domain that are really focusing on that productivity gap in the health care system.

First, and this was particularly obvious to us in our spirit of open government, we convened public hearings and got testimony from folks who don't normally come to Washington. A physician from Virginia said here's my problem. I've got a patient moving to Arizona. She's chosen a doctor in Arizona, who, by luck, happens to have the same software that I have. Patient asked me if I could send an electronic copy of her record to the doctor in Arizona so that the information will flow without having to be faxed or transcribed or something to that effect. Well, the doctor said I looked on the software and there was no button "Send to Colleague." So he asks us in this testimony. He says, folks, I don't know what highfalutin things you're working on, but why can't I just send a simple e-mail securely with respect to patient privacy to my colleague with my patient's information that she requested? And we said, yes, sir, that is our charge.

So literally weeks after the testimony, we embarked upon the National Health Information Network Direct Project to complement what had been a five-year technological effort, the Nationwide Health Information Network to spur information exchange. While we continue to do the larger visionary work, we said to solve this doctor's problem we want a very simple set of technical specs that would allow the Internet to be used for the transmission of health information. But because of the concerns about security and privacy we want to ensure with great confidence that it will deliver results. We launched the NHIN direct initiative in March. In three months we've developed four technical spec options. We will select those technical specs this month, and this fall we will have implementations in hundreds, if not thousands of physician offices. Literally within the year the doctor asked us to see this change, we will be delivering the technical framework that would enable all of this simple, cheap, and secure exchange of health information.

By the way, it also happens to be the simple, effective means to achieving meaningful use because one of the key provisions of it doesn't exist today, and that is we called for a patient is entitled to an electronic copy of his or her medical record. Hello. Pretty obvious. The tech community went up in arms and said that's never been in the requirements document before. We don't have that in our nation's hospitals or physician offices. It's just not something that we do. Well, now it will be a key factor in defining meaningful use and now that this platform will be available you will have access to it. So knock on your physicians' doors and demand access to this in the very near future.

Secondly, we acknowledge that there is this challenge in the information technology world that is shifting more and more power to the end-user, whether it be a doctor or a patient. I don't necessary want what you're going to share with me in terms of how I should know what medications to use or no. I might want to choose from hundreds of options. The notion here is how do we allow for the substitutability of applications based on the end-users' interests and needs? We invested a very modest amount of money, about $15 million, in a R&D center at Harvard run by Professors Mandel and Isaac Kohane to look at the substitutability of applications and the need for an open platform called the iPhone app store, although that's not really the right analogy by close, for the health care sector. And again, in the spirit of open collaboration, all of this is publicly available. You can all participate and collaborate. They'll be convening summits over the summer and have implementations literally within the year to demonstrate the power of substitutability of applications focusing on the nation's health care system. That's part of our commitment to drive change, not measured in budget cycles or legislative cycles, but literally in tech cycles, in 90-day turnarounds, 6-month turnarounds, one-year turnarounds.

Which leads to the final slide of putting this altogether to give you the context for how this technology policy ecosystem we believe will both transform the nation's

economy and help empower all Americans. And that's the final story about the 40th anniversary of the Internet. As Phil mentioned a few moments ago, it was DARPA that birthed the key infrastructure that we now know to be the Internet. And in celebration of last year's 40th anniversary, DARPA issued the network challenge. They didn't really know what was going to happen. They had a simple proposition. We're going to float 10 red balloons anywhere in the country. They're going to go up on one day and down at the end of the day. The first team that registers the latitude and longitude for each of the 10 balloons wins a whopping $40,000 prize. First, they had no idea if anyone was going to participate. Then they had no idea how they would actually organize themselves. And third, they had no idea if this could actually work.

Well, two days before the deadline when the balloons went up, an MIT team said I think we should do this. Just a small group of people. Overnight they built a 5,000 person network, and within 9 hours on the day of the launch they found every balloon. Two days. They thought of the idea to participate and they did it. How? They innovated on the design of the program. They created a tiered incentive model. If Vivek found a balloon, he'd get 2,000 bucks, which is half the fair value of the balloon finding. But if Phil invited Vivek to the network, then Phil got paid 1,000 bucks. And if I invited Phil who invited Vivek, I'd get 500 bucks.

SPEAKER: This is an Amway model. (Laughter)

MR. CHOPRA: Exactly. Well, over a million people tapped into their Twitter networks and Facebook networks to turn on this system. The person who organized this was a postdoctoral fellow, who, by the way, Darrell, I would argue that postdocs tend to be our most underleveraged asset in the innovation economy parenthetically.

This postdoc said, I will take what I've learned in this funny little competition and apply it to what I care about, and that is to build a global movement to address the billion

people today in chronic hunger. So in partnership with the U.N., he launched a petition drive with the same principle. But he didn't have 40,000 bucks, so he said you get special points if you actually recruit a lot of folks that sign the petition. And using that same tiered structure he's now built a global grassroots movement to focus attention petitioning governments on this issue of hunger.

This is the ecosystem that's converged. It was a research endeavor that led to DARPA to do the work on the Internet. It was a research pilot project, a prize or a competition in the spirit of open government that got this postdoc in turn engaged. And it got that postdoc's entrepreneurial spirits to then take it in an area that he cares about, and others on his team are now starting economic ventures built on mobile platforms.

MR. WEISER: If I can just jump in. One thing here, this is a key theme, is that often technology policy is about creating conditions for things that we don't know what's going to happen with, whether it's open data, whether it's a competition, whether it's smart grid. We don't know how these platforms get used, these opportunities get developed, but one of the exciting things about technology policy is all three things can happen.

MR. CHOPRA: And so we end with this observation: We are hungry for work. We are hungry for your ideas. We're passionate about using these tools to establish platforms for innovation. And you're going to see this as we see agency after agency with the 21st century technology and innovation focus that the President has called for, and we look forward to your active participation.

Thank you. And forgive me for going beyond our time, Darrell.

MR. WEST: No. Thank you very much. (Applause)

I actually like that tag team approach. I think you guys are ready to go on the road with this. It sounds like that's exactly what you've been doing.

We have a few minutes for questions, so if you can raise your hand, give us

your name and your organization. I think what I'd like to do is take maybe three or four questions and then each of you can pick out and answer particular ones. Right there is a question.

MR. FRASER: Mark Fraser with EADS North America.

MR. WEST: There's a microphone being passed over to you.

MR. FRASER: Mark Fraser. I'm the CTO for EADS North America. I'd like to applaud all the presentations.

It's very, I think, relevant to this discussion that you brought up DARPA, one of the leading innovative institutions in our R&D infrastructure. They've just initiated an industry summit outreach because they recognize even as being the most innovative organization in perhaps the federal government, they still need a lot of input from out of the box thinkers and from industry. And so my question to you is how are you doing that kind of outreach to industry to get more, better ideas and how to solve this problem cradle to grave?

MR. WEST: Okay. Let's take a couple more questions. Right there.

MS. WALKER: Hi, Molly Walker from Fierce Government IT.

I understand you don't want to massage the data too much; you want the raw data out there. But has there been any emphasis to agencies about responsible data release? Like, a lot of government documents are over 65,000 data cells and that can't be read very easily. Or let's say the data was collected one way in 2007 and differently in 2008. How do you provide context or make these more readable so that they can actually be used by developers? And has that been emphasized to agencies?

MR. WEST: Okay. We'll take one more question. Right here on the aisle and then we'll give each of you a chance to answer.

SPEAKER: Thank you.

MR. ABRAHAMS: Ed Abrahams, Personalized Medicine Coalition.

I understand that generally you want us to collect information and make it more available to, actually, if I understood you correctly and I confess having been trained in humanities I may not have understood you correctly, that you want us to be a better nation of consumers. My question is -- using better data. My question is what are we going to do to create a better future? I understand the electronic medical records, the doctor in Virginia wants to communicate with a doctor in Arizona, but how are we going to get to a better medicine of the future? How are we going to harness the power of research to create something that doesn't now exist so that we might also work on the supply side?

MR. WEST: One, two, three.

MR. CHOPRA: Yeah, absolutely.

MR. WEISER: So let me start with the first question. This idea of outreach and getting ideas out to the government is essential to all that we do. If governments sit and we talk amongst ourselves, that's not a very effective process with respect to looking for the best ideas. And particularly insofar as almost any policy domain you can think of, particularly in the technology policy, the actual implementation is not going to be within government. It's going to be within the private sector: states, communities, all sorts of different organizations. And so you need to get that engagement. Ideally, finding ways to go on the road to where people are, and also using technology to get people's ideas. So with respect to the standards effort I referred to, we start off with ANSI, you know, American National Standards Institute, talking to some of the standards professionals trying to get their ideas. We're continuing that dialogue as part of that process, and that's going to be critical to getting all the ideas that we can.

A critical reason why we're here and why we're so excited about what Brookings is doing is because it provides that form of engagement. And if you all say, hey, you're missing something. We don't see in your state of the union to use your metaphor, the

following ones, it may be because we've already gone over our time or maybe because there are some ideas we're not thinking about. So I would agree completely that we should never ever, you know, live in a cocoon and talk to ourselves. We need to be committed to outreach as a core part of what we do. And to the extent you all have those ideas, please talk to us afterwards.

MR. KUNDRA: In the context of data, one of the things we have to recognize is that there are two faces of technology. The same technologies that allow you to stand up a blog on a real-time basis, leverage GPS, socialize through Facebook, are the same technologies that can also be used when it comes to identifying people, thinking about privacy in the context of democratizing data. That is the reason when we release datasets they have to go through a very rigorous process at the agency level to make sure that the datasets are de-identified, that no two datasets could lead to an individual being identified. In the context of privacy, it used to be that we looked at privacy through the lens of personally identifiable information which was name, social security number, address, and so forth. But now with the advent of technology, that completely changes that context. And that's part of what agencies go through.

The second part of your question, which was around metadata, as data changes how are you identifying that data? Agencies actually fill out a very detailed template about the dataset itself, not just about, you know, the name of the dataset, but also get into when was it collected, how was it collected, the statistical elements around the dataset itself and the frequency of the collection itself. And so the combination of metadata and making sure that we're very rigorous about evaluating how these datasets could be combined, one, leading to privacy implications, and two, national security. So we go through a national security review also at the agency level and across government before the datasets are made public.

MR. CHOPRA: And data quality.

MR. KUNDRA: And the same thing with data quality. One of the things that we did as part of the Open Government Directive was that every agency now has a senior accountable official that's responsible for data quality. And part of what we're also seeing is as we put out these datasets, we've built into the data.gov platform feedback loops so that people are getting back to us and ranking and rating datasets so they can tell us very quickly which datasets don't have good data quality. And what we're seeing is our feedback loop is having an impact at the agency level where this greater transparency is leading to an improvement in data quality coupled with the senior accountable officials at the agency level.

MR. CHOPRA: And I want to make sure that I -- one of the challenges in a presentation like this is that we may have muted certain aspects of what we were trying to say today and emphasized others. The slide that highlighted our commitment to research and development absolutely is focused on the industries and jobs of the future. So let me just share with you a couple of examples.

Number one, that's where we had in the strategy for American innovation what should the big challenges be of our time that we could catalyze energy, an all hands on deck approach to address them. That's what we're going to be doing in developing our proposal for what those grant challenges should be born out of public input.

Two, one of the key themes every year is a letter written by Peter Orszag at OMB and Dr. Holdren, the President's science advisor, that issues a framework for where the thrusts should be for R&D investments and the go-forward budgets. And that's a terrific document to engage on the intersection of bio info and nanotechnologies as an example as we believe that would be an opportunity for growth. More on each of those domains highlighted in that annual letter that's published that will come out hopefully in the not too distant future.

But third, this is precisely why the President has renamed his innovation advisory panel. We have a program called PCAST, which is the President's Council of Advisors for Science and Technology, which has more Nobel Prize winners on it than are seated on this stage. And in that PCAST --

SPEAKER: (inaudible)

SPEAKER: Yeah, that's not saying too much, though.

MR. CHOPRA: That's true.

SPEAKER: No offense. (Laughter)

MR. CHOPRA: Well, fair enough. Numbers of people. We have more than four Nobel Prize winners on the PCAST.

Within PCAST the President established the President's Innovation and Technology Advisory Committee, which is a component of PCAST. Now, why do I say all this alphabet soup? June 22nd, PITAC will convene its first strategy session looking at the 10-year horizon and beyond for what bio, nano, and information technology-based businesses will look like. Today the price of a human genome sequencing might have dropped from 100,000 to 50. Maybe it's on its way to 1,000. What does it mean in a world where we have a $100 genome? What does it mean if you have the manufacturing capability through nano-manufacturing to actually introduce unique materials into airplanes? The gentleman here is from EADS. Right? The role of nanomaterials and nano-manufacturing into the supply chain, you have a modeling assimilation infrastructure component. You have a nano-manufacturing component. So you could take a look at each of these disciplines -- nano, bio, and info, in particular -- project out what their growth trends will be over the next decade, and to look at what the critical infrastructures will be necessary in order for us to support those industries of the future.

Just in your example of personalized medicine, if we get to a $100 genome,

what does the infrastructure of the nation's health care system have to look like? Does every physician need to have a gene sequencing device? Do we have to analyze information in the cloud in a more sophisticated manner? This is going to be the discussion. It will be publicly available on webcasts and so forth June 22nd, chaired by the two co-chairs Eric Schmidt and Shirley Ann Jackson, the president of RPI and the CEO of Google.

So, very much focused on the industries of the future. And forgive me if I had underplayed that in my commitment to R&D.

MR. WEST: So, Aneesh, if we have $100 genomes for 300 million Americans, Vivek, you really better get to work on cloud computing. (Laughter) Because the data storage implications are huge.

We have time just for one or two quick questions. One there and then Bill.

MS. STERN: Thank you. Paula Stern. I guess today I'm representing the National Center for Women and Information Technology, so I'll ask the women's question first.

And thinking about Brookings, having been a guest scholar here a gazillion years ago, the intersection of economics with the technology we're talking about today and the megatrends with regard to women in participating in information technology and science. We've seen dramatic changes in the U.S. economy as a result of more women participating and therefore the household incomes being greater as they've worked in the workforce.

I'm wondering if there's been any thinking done or considered to be done that what, if you will, megatrend implications there might be for increasing the intensity of participation of women, particularly in information technology and in engineering, and what that might mean for our future that you're spelling out today.

My second question is as a consumer. Medicare, the whole patient's transferability of information has always been the biggest issue from the consumer's point of

view for the last 15 years, 20 years, as long as we've been even thinking about information technology. And that has been -- this physician, thank God, he finally got to you all. But with regard to Medicare, I think there are a lot of consumers, many of them are going to be the poorest as well in this economy, who are still hampered because they have to rely on our services, insisting that things be sent by mail, which is ridiculous in this day and age. So I hope you've got at least an intern this summer working as -- pretending that --

SPEAKER: Got you covered.

MS. STERN: -- she is a 65-year-old woman that has just gone on Medicare and walk -- have them, as a consumer, walk through what is needed. Oh, my God. The money that could be saved.

MR. WEST: Yes. Thank you very much for that.

Hold onto that. Bill Antholis has one last question and then you can respond to it. Thank you.

MR. ANTHOLIS: Quick question, which is --

MR. WEST: We have a microphone coming up.

MR. ANTHOLIS: The volunteerism or the sort of low-cost network of public interaction is very impressive. But any of us that have worked in complex organizations, particularly of the .org or .gov know that you're competing with the private sector for top-quality talent. You mentioned young postgrads as an important force, but give me a little -- give us all a little sense of sort of what the personnel -- what the IT personnel in the government looks like right now, your own efforts at recruiting, where you see the future of that in competing with the private sector salaries.

MR. WEISER: All right. I'll take the first one and a couple -- this was a softball for those who don't realize it. Lucy Sanders, who runs our organization is a friend; the chair of the organization, Brad Feld is another friend. It's a phenomenal organization,

National Center for Women and Information Technology. It's a great example of the type of social innovation that we've been talking about. People who out there are putting together coalitions to grapple with public policy challenges.

I would also add -- I know Lucy and Brad are passionate about this as well -- it's not only women. It's people of color. Because the extent of the workforce in IT, this then takes me to the final question, you know, has been predominately white male. Now, that, given the demographics of this country, you know, is not a great equation. We need to change that equation. If you look at this pyramid that we referred to earlier, at the bottom education is a critical piece of it, more particularly STEM education. For those not in the acronym world that's science, technology, engineering and math. And the Education to Innovate Challenge -- Educate to Innovate, for those who haven't heard about this, it's an unbelievable program. We'd be remiss if we didn't recognize Tom Killalea, who has really been the mastermind behind that. Tom also wrote a Hamilton Project paper here on the role of prizes in helping to spur innovation. And Educate to Innovate is basically saying it's a private sector challenge. Let's build a partnership. (inaudible) has been formed on this. Getting companies to say how do we grapple with the, you know, challenge of getting people excited about science and math in this country? We need to have a generation of, you know, people who are passionate, thoughtful, creative, well educated. To take on the jobs of the future they have to be across all demographic groups. And that has not been an area that we have thrived in.

Where the great ideas are going to come from, how to get people enthused is something that we are very much looking at. The level of innovation, by the way, in the Department of Education is off the charts. There's a lot of thought going on within that department on this and some very high quality people there. So, yes, this issue is very much on the agenda. I think it's in the category of things we didn't have enough time to do

justice to, but stay tuned on that. We're definitely focused on it.

MR. KUNDRA: So I'll respond to rapid fire. Number one, the President convened basically a workplace of the future summit maybe a month and a half, two months. My dates are off. But one of the key pillars of engaging more people under the nation's workforce is telework. We had at the job summit last December the CEO of ARISE, which has a global -- a national network of home-based workers who -- now 75 percent of them are women who choose to take hours that they are comfortable working. And what they're finding is extraordinarily talented women who have been disconnected from the workforce. Because of broadband to the home, they can connect at a pace that works for them and they're seeing tremendous results. And they've commented on that and the President acknowledged that at the job summit. Part one.

Part two; we are very focused on customer experience design. Next Monday on the 14th, I have the honor and privilege of chairing a working group the President has called for and the implementation of the Health Reform Bill. One of the principles of it is how are we going to enroll 35 million Americans into this experience? Do they want to experience DMV lines of the past or do they want to experience the iPad-like experience that they might see in today's economy? We are launching on the 14th a working group precisely to look at the electronic tools necessary to make that process a pleasant one for the American people.

And related to that, we're also empowering folks to say, in the case of Medicare, we were pleased to announce -- last week we announced Medicare and the Veterans Administration are rolling out a concept called Blue Button. That is if you visit Medicare -- mymedicare.gov or myhealthyvet.gov there will now be a blue button. Not only will you be able to see your data in the government application, which may or may not be a cool application. It may be lame. You can now push the blue button and download your

own data, or your family or loved ones with privacy protections built in, can then take it and present it to anywhere you feel more comfortable. So if you don't really want to visit mymedicare.gov because it's just not the way you want to engage, but you want to download that information and use it in another context, you will have that blue button. It'll be live this fall.

And last but not least, as I transition into the culture question, this president was very clear on having both a chief technology officer and a chief information officer to take a dual approach to the issue. One is essentially the chief technology officer HR position is really without portfolio. They're policy advisors to principles, either cabinet secretaries or to the President with a specific focus on external innovation that can be brought in and addressing our priority policy objectives. And we are recruiting people that come out of the entrepreneurial ecosystem. We have, for example, Todd Park, who had founded what is now one of the most successful health care IT companies, Athena Health. We're not competing financially, my man, with resources in the private sector. People are inspired to serve so they're coming in to new positions so that we could actually tap into their brain power. We have a growing cohort of innovation leaders throughout the administration run by presidential personnel to keep us together and to inspire and to recruit more. I'd say one of my top priorities for my job as CTO is actually to see Todd Parks in every agency. And that's something we're actively doing.

And I'll let Vivek say a few words about the rock stars he's bringing in on the CIO front.

MR. KUNDRA: Now, before I jump into that, you know, one thing we have to recognize clearly, ultimately the building blocks of innovation are people. And we face two challenges: One is a short-term challenge within the federal government, and second is a long-term challenge as a country. In the short-term, if you think about, you know, borrowing

the iPad versus the DMV analogy, working in the federal government in terms of getting the job itself was a DMV experience. That is why we've taken on hiring reform. And Director Berry is leading that at OPM.

In terms of the IT space, whether CIOs across federal agencies or more acutely this is a more serious issue in the cyber security space, we haven't been able to attract the top talent. And we're working aggressively and the President is committed to this as he talked about making public service cool again. And across the federal agencies what we're trying to do is make sure that we're bringing in the brightest people this country has to offer into public service. Whether it was making sure at the Department of Homeland Security. We streamlined the hiring process so you could make job offers on the spot. Or whether it was making sure that as far as the experience, in terms of coming into work day one, was far better than it ever has been before because that has a huge impact, long-lasting impact on moral. And then, of course, introducing game changing technologies, which is what inspires a lot of people to work on meaningful stuff that fundamentally changes the way this government operates.

The longer term issue that we're also investing in is making sure that as a nation we're focused on science, technology, engineering, and mathematics. That is why the Department of Education, Secretary Duncan, is leading the Race to the Top challenge with a focus on STEM with over $4 billion invested in that space. But we need to make sure as a country that we're investing in human capital, especially in STEM, so that we can educate the workforce of the 21st century to remain competitive in the global economy.

MR. CHOPRA: Wouldn't it be fun to work with the three of us? Now, come on. (Laughter)

MR. WEST: Well, it's been fun to be on stage with the three of you. And I like that line about making public service cool. That is a marketing campaign right there.

But we are out of time on this panel.

We're going to take a short, few-minute break to do the transition to the next panel. But I want to thank Aneesh, Vivek, and Phil for sharing your insights with us. Thank you.

SPEAKERS: Thank you. (Applause)

CERTIFICATE OF NOTARY PUBLIC

I, Carleton J. Anderson, III do hereby certify that the forgoing electronic file when originally transmitted was reduced to text at my direction; that said transcript is a true record of the proceedings therein referenced; that I am neither counsel for, related to, nor employed by any of the parties to the action in which these proceedings were taken; and, furthermore, that I am neither a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

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