UNITED STATES DEPARTMENT OF COMMERCE

DIGITAL ECONOMY BOARD OF ADVISORS (DEBA)

PUBLIC MEETING

MONDAY, MAY 16, 2016

8:34 a.m.

The United States Department of Commerce Digital Economy Board of Advisors met at 8:34 a.m., at the Commerce Research Library, 1401 Constitution Avenue Northwest, Washington, D.C. 20230, when were present:

A P P E A R A N C E S

COMMERCE DEPARTMENT:

PENNY PRITZKER, United States Secretary of Commerce

BRUCE ANDREWS, Deputy Secretary of Commerce

LAWRENCE E. STRICKLING, Assistant Secretary for Communications and Information

ALAN DAVIDSON, Director of Digital Economy

EVELYN REMALEY, Designated Federal Officer

DIGITAL ECONOMY BOARD OF ADVISORS:

ZOBAIRD, DEBA Co-chair; Markle Foundation

MITCHELL BAKER, DEBA Co-chair; Mozilla

KAREN BARTLESON, Institute of Electrical and Electronics Engineers

GREG BECKER, Silicon Valley Bank, SVB Financial Group

JAMES CICCONI, AT&T

AUSTAN GOOLSBEE, University of Chicago

MINDY GROSSMAN, HSN, Inc.

OISIN HANRAHAN, Handy

SONIA KATYAL, University of California at Berkeley School of Law

JAMES MANYIKA, McKinsey Global Institute

WILLIAM RUH, GE Digital

APPEARANCES CONTINUED:

BRAD SMITH, Microsoft Corporation

COREY THOMAS, Rapid7

MARTA TELLADO, Consumer Reports

ALSO PRESENT:

SENATOR MARK WARNER (D-VA)

AGENDA

PAGE

P-R-O-C-E-E-D-I-N-G-S

MS. REMALEY: Wonderful. Good morning, everyone. Secretary, thank you very much for walking us through that. Congratulations. My name is Evelyn Remaley, and I'd like to call the first Digital Economy Board of Advisors meeting to order.

I just want to introduce myself. My name is Evelyn Remaley, and I'm the designated federal officer for the board. And there are just three things to remember about that. One, you'll be hearing quite a bit from me over the next two years. So hopefully, that's a good thing and we'll try not to make that too painful.

The second thing is that I am the person responsible for making sure that the work that we do is open and transparent. So I will be keeping track of that as well. As a FACA, we need to be working very openly and with public participation.

The other thing to remember, and I think the secretary has actually characterized this very well, is that me and my time, we're actually going

to be the bridge for the group into the next administration. So I want to let you know that we'll be working with you for the full two years and helping to be the glue between those two.

In my day job, I'm actually the deputy associate administrator for policy analysis and development at NTIA, a mouthful of a title. And NTIA is responsible for really watching and stewarding the Internet, making sure that it remains open and free and secure. We really help to keep the flame for the Internet. Larry Strickling will be talking about that a bit more.

But I wanted to just say that I'm very honored to be serving with you all in this capacity. I appreciate the secretary and assistant secretary placing this responsibility with me. And thank you again. And now, let me pass the meeting over to the secretary. Thank you.

SEC. PRITZKER: Well, first of all, I just want to say thank you to all of you. You have given your most precious thing, which is your time, to help us to address a number of really

exciting but challenging issues that we face, not just at the department, but as Larry will tell you, our responsibility to really be the chief advisor to the president as it relates to digital issues. And so, I'm really excited that all of you have agreed to be a part of our Digital Economy Board of Advisors.

So thank you for that. And I particularly want to thank Zoand Mitchell for your willingness to lead this effort. It's very important that we're well-organized and well-focused and I think that the group is in great hands. So I'm very excited about that.

As you know, you met last night our assistant secretary, Larry Strickling, and also our digital director of digital economy, Alan Davidson, and of course Evelyn, who's our -- not only our chief federal officer, but plays many roles for us at the department.

Really, the focus of the Digital Economy Board of Advisors is to help us understand what is the most effective way that we can be engaging as

it relates from a policy standpoint with the changes that have come about because of the digitization of everything. And fundamentally, there is this notion of there's the digital economy and the non-digital economy.

I don't buy that distinction. I think everything has become -- runs on a digital platform. I don't care -- and certainly GE would be the primary example of that -- acknowledging that. And so, the challenge that we face is that the pace of change going on in industry is so fast and government is really tending proactive in this instance. And we find ourselves dealing with some very complex policy questions without the kind of guidance -- bring to us. And I think as you think about your work -- dimension.

We're, of course, as political appointees, time-dated. But the work is not time-dated. And so, part of what we're hoping for you to do is to develop an agenda that bridges not our -- not just our work but the work into a future secretary. And we feel part of what we're doing

is laying out with our professional staff, who will survive us as politicals, and for the next secretary and political leadership, an agenda that is really robust and is well-informed by all of your experiences and your personal leadership in the economy. So that's a very important role.

The second is to help us think about what are the dimensions or different topics that we should be focused on as a department and help us think even about organizational questions. Do we have the right structures in place to be able to do our job effectively, which is, among other things, to be a policy creator and a policy advisor as it relates to things that are issues that are raised by virtue of the fact that our economy rides on a digital infrastructure.

And you can help us to identify what are the emerging challenges, what are the trends. But you can also help us identify what are our opportunities to help shape the policy construct that will help address issues that are being raised daily at this point.

Many of those issues, whether it's privacy, cybersecurity, et cetera, are well-known topics. But the implications for technology, for innovation, for intellectual property protection, for our entire -- you know, I could go on and on -- our economy, of the fact that we live on a digital backbone that was never designed to become the digital backbone of the economy. It was designed for a different purpose. And now, we're retrofitting it constantly to fit its really ubiquitous role.

So I think that this is -- you all have a big task. So what I would then say is what is most useful is not to boil the ocean, but to pick three to five, three to six things to focus on and really see where you can move the needle. And it doesn't mean that other issues aren't important. It's a question of focus and prioritization because, while you are mighty, there is a finite number of you. And your staffs have finite amounts of time.

And we have found that our most

effective advisory groups have some focus and tend to try and have things that they get done, so then there's a sense of accomplishment and confidence in the process and purpose of the group. And then, you can move to different issues, as opposed to trying to tackle everything at once.

So I just want to close by saying thank you, thank you to the leadership on our team who I have enormous confidence team, and thank you to all of you for your commitment to this group.

MS. REMALEY: Thank you.

MS. BAIRD: Thank you -- oops, sorry -- to be able to work in this capacity and I thank the secretary very much for creating this board, for seeing the centrality of the issue to the future success of the country and to all of you for being willing to collaborate. And Mitchell and I very much look forward to working with you on trying to make this digital economy work for all Americans, which is really what I think we should have as our touchstone.

It's the largest transformation in the

economy in probably a hundred years, since we moved from an agricultural economy to an industrial economy. There's tremendous anxiety, fear, even anger in the country because people don't feel that they are participating, that this digital economy is something where they can see themselves succeeding. We've had stagnant wages. Wages have been flat for many people for a long, long time. And the digital economy is even more disruptive.

So I think we should start this work with a very strong sense of purpose and sense of urgency because so many people in our country feel that het digital economy is undermining their success, when I think we all feel that there's tremendous potential for people to succeed through the digital economy.

There's the opportunity for small businesses to use data to find markets all around the world and to grow and hire more people. There's the opportunity for people to get retrained in order to participate in and succeed

in the jobs of the future, to find new career paths, maybe to get stackable credentials that, over the course of a lifetime, enable more people to get a college diploma.

So I think we all feel that there's tremendous potential in the digital economy. But it's up to us to help the Commerce Department really drive this so that everyone in our country and around the world can participate and succeed and this can be a benefit to everyone.

And so, I hope that we'll use the talents and knowledge of everyone here, who understand that you can use 3D printing to make any place an advanced manufacturing facility, you can use Internet tools to enable people to target the skills that jobs -- that employers want and to find the training.

And we need to find ways to really provide energy behind that, to enable the Commerce Department to fulfill its capacity to focus on the right things and enable people throughout the business sector and education and training sectors

to play the role that they can play.

So I wanted to start off just having us appreciate this is no ordinary board. And the secretary's created this for no ordinary task. This is a tremendous transformation and I think she has very high expectations of us. So I really look forward to working with everyone to see if we can step up to that. Mitchell?

MS. BAKER: I'd like to start by saying thank you to the secretary for creating this board and including me on it. I'll agree with everything that Zosaid and add that I think the Department of Commerce is a realty exceptional place to tackle these issues and to take advantage of the opportunity side of the equation.

You know, here in the United States, the power of commerce, and private commerce in particular, guided by an appropriate social framework is part of the magic sauce of the United States.

And so, that question of the appropriate social framework, what priorities and policies are

important from commerce, how to engage productively with private activities and how to build a new society based on a digital backbone that carries the magic that we've known of private economic opportunity unleashed, innovation available, citizens educated and able to participate with growing opportunity, that is a key to our future.

And commerce has a particular role to play. It's always been exceptionally important in the United States. And to my surprise, as a lawyer in training, you know, fundamental constitutional questions about the nature of the United States have come out of commerce and the nature of commerce.

And so, it's an enormous opportunity. And I think we have the background and the scope and I think that this board of advisors in this location and time can do something that's rare internationally. And we can focus on opportunities and challenges, plus private initiative and innovation and hopefully, and

importantly, if we do well, bring in opportunity to more citizens so that the opportunities are visible and the change is less scary because there's hope.

So I echo the excitement of working with you. I echo the belief that good policies and priorities are important. And I think we're in an unusual and unique position, both in the United States, but also globally, to be able to tackle these issues. So thank you all for joining and I'm really thrilled.

MS. BAIRD: Larry, I think we're looking to you.

MR. DAVIDSON: Oh, I was going to say I think when we had -- not to -- I think when we had contemplated this section of the agenda, I think we also -- not to step on the prerogatives of the chairs, but I think we had contemplated at least opening it up for any conversation or questions for the secretary --

MS. BAIRD: Great.

MR. DAVIDSON: -- or for the co-chairs

about what you've said and about the kind of goals for the board, because I think you've laid out kind of an ambitious set of ideas about what we could do. And I think we just wanted to make sure that others had a chance to chime in before we jumped into our presentations, but there may be no comments, unless -- okay.

MS. BAIRD: Thanks, Alan. Larry?

MR. STRICKLING: Good morning, and thank you. And thanks to all of you for your willingness to participate in this committee. We're at an important point, as the secretary mentioned, here at the Department of Commerce as we expand our horizons to pull in a variety of issues that we're now putting under the rubric of digital economy.

But it's based on a foundation that I wanted to spend a little time just introducing you too in terms of what we've been working on the last several years here at the department, which has been perhaps a little more focused on pure Internet policy.

And so, we welcome the broadening of this inquiry to include these larger issues of the digital economy writ large. And I think that's an important evolution for us here at the department and a point at which you all can make a very key contribution to us as we start laying out an agenda for dealing with these broader issues.

But for the last several years, as we've focused on Internet policy -- and I'm speaking primarily for NTIA. But this has been an effort for the last several years that has engaged many of the bureaus here at the department, including the Patent and Trademark Office, the National Institute of Standards and technology, our International Trade Administration have all participated in the work we've done.

But it's all come out of some very basic principles that we have followed. One is we want to maintain the Internet as a free and open space that continues to allow economic growth, to thrive, spurs job creation and encourages and supports free expression.

And underneath that, there are two key principles that we have really organized our work around the last several years. The first is the building of trust and the maintenance of trust by the users of the Internet. And this brings within it a wide variety of issues. Obviously, privacy has been an important one that we've spent some time on, as well as the protection of intellectual property, dealing with the issues of cybersecurity.

But all of this is based on the idea that this tool will work best as long as people trust it. And unfortunately, we are starting to see a decline in public confidence in the Internet.

Through some work that we've sponsored with another of our sister bureaus, the Census Bureau, we released some information last week that indicates that people who are heavy users of the Internet are starting to stop using it for particular tasks because of the fear they have that their private information might be

compromised through a data breach or through the use of the information in a way that they're not used to.

So we see trust is an area where we have to continue to put a lot of emphasis. Here at NTIA, we have convened stakeholders to develop codes of conduct to improve consumer privacy. We worked with the Patent and Trademark Office in a stakeholder process to deal with the issue of notice-and- takedown for illegal content that may be out on the Web. NIST has utilized a lot of these tools in terms of developing its cybersecurity framework. So all of these come under this notion of building trust.

Now, the other key element for us has been inclusion. How do we get people connected to this and how do we make sure that not just domestically, but internationally we are doing what it takes to get as many citizens of the U.S. and citizens of the world connected to this technology?

And so, in the United States, we've done

a lot of work on infrastructure in terms of things direct as finding more spectrum to be made available for broadband services. We also had the opportunity to invest $4 billion in projects under the Recovery Act to expand the amount of Internet access or broadband access that would be available in more underserved parts of the country.

And as part of that, we've also focused on how to get people the tools they need to have to utilize this infrastructure. So we have spent a lot of effort on things like digital literacy training and sustainable adoption programs to get people to actually subscribe to these services and use them and benefit from them because it's becoming increasingly difficult for anybody to operate in today's economy without these basic tools of digital literacy.

Internationally, we have been involved with primarily ICANN as it continues to evolve as an organization trying to engage the world in terms of having more countries, more companies, more individuals connected to the Internet. And

throughout all of this, we've been experimenting with the tools of governance and the tools of policymaking.

We have certainly found, and it's no surprise to anyone, that the traditional forms of regulation and legislation really aren't serving this economy. And we have to find alternatives. We just can't wait for the regulators to catch up on last year's issues or wait for the legislators to deal with these very complex problems.

And so, we have spent a lot of time focusing on how to get -- make progress in this space without utilizing the traditional tools. And so, we have focused on what is now we've been calling the multi-stakeholder process. And when we started with this back in 2009 and 2010, you know, the smart people said, oh, that'll never work. You'll never get a newspaper to publish the word multi-stakeholder because it's too complicated. No one will understand it.

But it absolutely has become part of our lexicon today for people who work in this space.

And what it does is it involves any stakeholder who wants to participate. There are no credentials required. If you want to participate, you show up and participate. And we also provide -- it's not a consultation. We provide to these stakeholders the opportunity to actually reach a consensus decision on a topic.

That's how we've done our privacy codes of conduct. That was the way the notice-and-takedown work was done with the Patent and Trademark Office. And it's a tool that we continue to explore and continue to look for opportunities to utilize as a way to have people make progress on these issues without having to wait for their local commission or their local legislature to catch up with the problem.

And so, it's something that's of continuing interest to us as we focus on how to make policy in this space and how to make progress in this space, in addition to dealing with the actual substantive issues we have to deal with.

And now, for I think more discussion of

that, I'll turn it over to Alan take you through the digital economy agenda as it's been developed here at the department.

MR. DAVIDSON: Let's see how this works. Good morning. I'm Alan Davidson, director of digital economy at the department. Great to see so many of you here.

I do have a first set of slides we'll be using. They've been -- they're actually in your packets. For those of us who are up at the table, they look like this. And we're projecting, and for folks watching at home, hopefully the projection has got it on the Web and we'll be posting these also because of our -- yes -- interest in transparency and openness. And my slides are not as awesome as James Manyika's slides coming up.

But I will -- I'm excited to be talking to you today a little about our agenda here. And I'll say I've been at this job for almost a year now. I think I was brought on in part with the theory that this is a far-flung department, one of

the things that really struck me when I joined, 47,000 employees, 12 different bureaus -- you've heard a little bit about it -- all of which are now finding themselves doing pieces of work that we would think of as being digital or related to the digital economy or Internet policy.

And so, I came in, in part, to help create an integrated approach, a broad, cross-departmental approach to thinking about the digital economy and of course this very advisory board as part of that effort.

I think our goal for the next couple of minutes was just to make sure that we were giving you a flavor for the agenda that we've created over the last year and that we've been honing and we would, of course, love your feedback. A lot of the topics we're going to touch on, very quickly, are things that we could talk about for hours and hopefully will in some ways in our work over the -- in the coming months do that.

So just a -- so just in terms of a quick level set, and of course some of these things are

things we've been talking about for a while. Let's see. If I point this -- that totally works. So just a quick sense of our theory of the case, our starting point, as you've heard, there's a strong belief here that the digital economy is a key part of the future success of the broader American economy. And it's a source of growth. It's an enabler of trade.

We see data that shows us things like the fact that ICT is already over 5 percent of GDP. But that's only a little part of the story. The coming digitization, the importance of the digital economy and digital trade is something that we know is going to be an ever bigger part, feature of our economy.

At the same time, we know that the success that we feel we've had so far is something we can't take for granted, that technology is changing rapidly. It's an incredibly competitive business environment.

But also, that there is a -- if anything - - maybe a pendulum swing, in some ways, about

regulation of the digital economy, particularly globally, and that the openness that we've taken for granted and the idea of permissionless innovation that has been so critical, we think to the success of the Internet is not something that we could take for granted, especially in the international environment.

So that is something that has motivated our thinking about our agenda. We saw -- we set out a set of grand, both -- I call them sometimes grand challenges. The secretary is very keen to call them opportunities as well. And we see these opportunities - and they really reflect a lot of the dynamics that Larry just outlined.

And we've created an agenda that focuses on four main pillars: promoting a free and open Internet around the world, where data can cross barriers and borders without a lot of barriers to that flow of data. A second is the pillar of trust, promoting security and privacy online because we know that the digital economy will only thrive and only succeed if people can trust that

their privacy and security is protected. A third is this area of access and skill building, very much the digital inclusion issues that Larry was talking about. And a fourth is how we can play a role in supporting innovation and emerging technologies.

And so, this fourth slide is really sort of the business end of this, which is how we map a lot of the activities that are happening within the department against these priorities. And I'll just tick through some of them really quickly. And I'd really like -- we'd welcome your comments or questions.

We've got -- in the area of promoting a free and open Internet, I say open Internet not in the net neutrality sense of openness but in the cross-border flow of data view of openness. We're doing a huge amount of work. This comes up, for example, in areas like we've just recently launched a project on digital attachto put people in the foreign commercial service at post in embassies who can help us tackle some of these

challenges.

Larry talked about IANA and ICANN, the work around the digital single market in Europe, making sure that it continues, even as we find many positive things about it, we are also working with our European colleagues to make sure that it doesn't unfairly impact U.S. firms.

We're doing a big project on the G20 meetings this year, which will be held in China, where there's a digital economy work stream and making sure that that is something that still promoted openness and freedom on the Internet. We're doing a tremendous amount of work in the trust agenda. The privacy shield and the negotiations we've had with the Europeans around cross-border data flows between Europe and the U.S. has gotten a lot of attention.

We're doing a huge amount of work on cybersecurity. We're supporting the president's Cybersecurity Commission. We have the NIS cybersecurity framework, which is a huge public-private partnership. We do a lot of work on

government access to data. We've got some privacy multi-stakeholder processes underway.

We also think about intellectual property in this category of trust too. So we recently published a paper on copyright in the digital age, for example. Access and skill building, you heard Larry talk about our work on broadband access, on spectrum.

We also care a lot about thinking about how we build skills. The secretary was just out in Silicon Valley, in fact, in the Bay Area last week talking to ed tech companies and career accelerators and thinking about how we can play a role in helping to make sure that people have the skills they need to succeed. So it's more about just getting online. It's making sure that people can succeed when they're online.

And lastly, I think one of the things that's really exciting to us is this area about emerging technologies. Part of it is, of course, the work of PTO in supporting good, smart patent reform. But also, thinking about how we can

engage in emerging areas.

So we have a new project we've been working on, for example. There's a lot of work in the department in particular on new technologies like autonomous and connected vehicles. We released an RFC around the Internet of things. We find people doing work on things like drones.

And we're trying to bring those -- collect those different groups of people who are working on these things into working groups so that we can offer support for emerging technologies that we think are really important and also we can do some issue spotting early in the development cycle to think about how we deal with the potential -- both the opportunities and the disruptions that come from new technology.

So that's sort of a whirlwind tour of the things that we're working on. We have some structural initiatives that we're also doing. This board of advisors is one of those. I mentioned the attachproject, our support for emerging technologies to build capacity.

But I'll leave you with this slide four, which is really, like I say, our broad map of the big themes we're working on and the big policy challenges and opportunities we see. And as you see, just not -- just a -- these are the big picture issues. There are tons of smaller projects happening in the department on these areas and we welcome the chance to engage with you on them. So, thank you. We welcome your questions.

MS. BAIRD: Does anybody want to make a comment or ask any questions of the leadership of the department before we move to focusing on the substance of our work and trends? Any comments on what's been said so far or questions?

MR. DAVIDSON: And I would just ask, either now or later, we welcome -- are we missing anything? Does this make sense? Does it resonate with you folks? You've heard Larry talk about the - - you know, the big challenges we see.

This is kind of one map -- one way to write it up. There are lots of different ways to

cut this -- slice this. But we'd be really interested in your thoughts on whether we're missing anything or --

DR. MANYIKA: Thank you, Alan. I was just going to ask one questions. One of the things that's extraordinary about the place where commerce sits is all the different agencies and entities underneath it.

I'd be curious what other things, with regard to measurement, to what the -- you know, the bureaus, I think like the Bureau of Economic Analysis, do with respect to support you in what you're doing with the digital agenda. It's a very impressive agenda, by the way.

MR. DAVIDSON: And I'd just say I think it's a terrific question. We've actually engaged in -- it's actually like a sub-bullet and I should probably pull it out because it's becoming a bigger part of work. Under our free and open Internet, for example, we've just started a project in coordination with ESA, the Economic Statistics Administration, here to do more work on

measuring the digital economy, something that I know we'll be talking about more.

And we in fact -- was it just last week -- just last week, we had a roundtable of economists -- one of your colleagues was there, actually -- talking about how we measure cross-border data flows. So we actually have a work stream in process right now where we're beginning to think about this issue of measuring -- well, measuring the digital economy writ large, which is a huge area.

And even -- but the most actionable thing we're doing right now is specifically trying to think about cross -- we're slicing off this piece of, okay, let's just focus on cross-border data flows as a starting point. How do we measure that? And I think that's just the tip of the iceberg.

I would also say there are other huge areas around data that aren't even mentioned here. We've looked at our -- you're looking at our digital economy policy agenda. We also are doing

a huge amount of work with data. We have a chief data officer, I think many of you have heard about this, we've launched something called the Commerce Data Service. And you know, arguably, you would say data could be part of this larger umbrella.

Structurally, we have a -- we've got a little bit of a structural separation in the sense that we've got a group that's working on these data projects and you're looking at the policy agenda. But we are -- we work very well very closely together.

DR. MANYIKA: Thank you.

MR. SMITH: I think it's a really useful framework and I like the four categories you have. When I look at access and skills, I think one aspect that is perhaps missing is a focus on the needs of people with disabilities.

You know, one in eight Americans has a disability. And just as the Americans with Disabilities Act really opened access to public buildings and infrastructure a generation ago, you know, it's just readily apparent that that group

of people is only going to be able to achieve their potential if all of these digital resources are open to them as well. And there's perhaps an opportunity to explore that a bit more.

MR. CICCONI: Just one other thought. I'm not sure how to capture this, Alan. But these are all very positive, forward-leaning things. But I think one of the things that we're seeing this year is a lot of concerns about the digital economy growing in our political system too and the levels of disruption. And in fact, skills training and things like that aren't necessarily keeping up.

I know that one of the things we're going to be doing over the next four years is as we virtualize our network and go to software-defined networking, we're going to buy roughly half the level of equipment on an annual basis that we buy today. You know, that roils through a lot of companies there. We're probably going to need half the number of people actually tending -- and I imagine this is true across a range of

things. And I do think a lot of the things we're talking about here depend heavily on political consensus.

And I do fear that that's starting to break down, just because there's a lot of -- a growing segment of people in this country that feel left behind as this economy charges forward into the digital age. And so, again, I don't know how to capture it. But I do believe it's a factor that affects all of these things.

MS. GROSSMAN: I would say the one other thing, and we're certainly talking about training, but how does it go all the way back to education and early education and are we building the skills at the beginning that we're going to need for, you know, many years to come, because we can train and we can take people out of school, but how are we changing the education process?

DR. TELLADO: Thank you. I wholeheartedly appreciated the framework you provided, because it is daunting. And so many of us come from slightly different places. And as a

consumer voice, I look at these and it raises a lot of questions. I wanted to build on something James put on the table having to do with other agencies.

And having spent enough of my career here, you raised an interesting thought in one of your blogs that you asked us to read around the Internet of things and how lines are being blurred. And give us some insight. Because the lines are also being blurred in the digital economy, how that translates within a governmental context where you have health, telecommunications, commerce are all in this pot, rulemaking.

But it's not consolidated. It's not holistic. So how do we get some connectivity to other agencies which are in this space but commerce is not empowered to oversee or to -- just wanted a little bit from you there.

MR. DAVIDSON: Yeah, and others can chime in too. We have a -- on the Internet of things particularly, we have a request for comment that we've put out. And I think you've raised

this really good question, which is -- and part of the motivation behind this RFC and one of the things we specifically asked for is how do we need to be better integrated as a whole-of-government approach, because one of the things that we're worried about is the Internet of things is so broad, you're starting to see rules -- we do this -- we are very good at doing sort of very kind of stovepipe, sectoral rules.

So we're seeing rules around connected vehicles, rules around, you know -- potential rules, anyway -- ideas around drones, for example. Instances of the broader Internet of things. And we want to make sure there's consistency, right?

So just even take something like spectrum or cybersecurity. We want to make sure that, yes, we can tailor make these kind of approaches for those particular areas, but that they're not in conflict with each other. So you find that, you know, nothing can -- there's not interoperability or we've got very conflicting standards among different areas.

So that is an active area of investigation. It's a terrific point. You know, and at some level, we're the Commerce Department. We can really only control what the Commerce Department does. But on the other level, our hope is that if we offer some intellectual leadership here and try and create frameworks, I know that we do work very closely with a lot of these other agencies and particularly on issues like cybersecurity, where we have a huge amount -- or privacy, where we have a lot of expertise in the department and we're working hand in hand.

SEC. PRITZKER: My observation, having come from the private sector into government and not coming out of government, so there are a lot of pockets of both void and overlap, if you thought about charts or Venn diagrams. And our approach has been one of trying to build -- I like the words that Larry and Alan used about intellectual leadership. And I would applaud Larry, who frankly has been here the longest of us, who really began tackling this and defining

the footprint without necessarily other -- guidance from others, if you will.

I think that an administration and this administration, you know, my observation is there's lots of pockets. But what we've tried to do is create a more wholesome or holistic -- not wholesome, holistic -- approach, taking into account that -- kind of empowering ourselves because the private sector is such an extraordinarily large footprint when it comes to the digital world.

And so, one of the things that you can do as a group is to step back, look at our framework, maybe give us -- you know, how we should adjust and advise, but then also put that in the bigger context. An administration ought to think about a policy expertise that exists in the department that -- and we're trying to institutionalize what we've created because it shouldn't just go poof, and then some poor new secretary has to reconceive of what is the construct that you ought to have.

We're in the process of creating another deputy assistance secretary under Larry that might take on the roles that Alan is doing, because right now, we've kind of just created all this. But for it to survive -- and frankly, it needs ultimately to have more professional and career support under it than we have today.

So one thing you might look at is what's our literally organizational structure and what -- how ought it to be staffed appropriately so it can play the role that we've sort of -- we woke up and defined this ourselves. Nobody said here's what you ought to do.

And so, it's a little bit of being entrepreneurial in a government sense. But it's also recognizing an enormous void. When Larry and I got dragged into the privacy process that was run by John Podesta at the White House, you really realized that there was no center of expertise.

And that really led us to evolve from that to these two gentlemen, with Evelyn really saying, okay, we've got to grab this and begin to

define what are the capabilities, what is it that ought to be going on. So you have a big role in helping shape this or, as I said, bridging into future administrations.

MS. BAKER: And I want to thank James for leading us off here with an overview of the sets of issues relating to the digital economy. And I think with that, I'll just turn it over to you, James.

DR. MANYIKA: Thank you, Mitchell. Madame Secretary, thank you very much for the privilege and opportunity to be able to serve in this capacity. And I'm actually quite delighted to be able to do this with an extraordinary group of colleagues, many of whom I've kind of watched and been amazed at what they've been able to do in the world. So this is a real privilege.

I'm going to try and give a short overview of some of the trends and opportunities in the digital economy. This is by no means intended to be exhaustive, because it can't be. This is a vast topic, as we I think can all agree.

But I thought we would highlight some key aspects of this, of what's going on.

The one thing you notice, and I think the secretary said this, which is we do seem to be digitizing just about everything, whether we think about where we live and the way we live in our homes, how we as individuals move about the world and conduct commerce, track information, find things, track our own health of our bodies and also when we go to work, how we actually get to work in terms of how our transportation systems and mobilities have evolved, as well as what we actually do at work, whether it's in an office or actually in the factory.

So we do see -- digitization does seem to be touching most aspects of just about everything. This obviously raises a question as to exactly how big is a digital economy. And I think Alan alluded to this, which is if we think about just the sectors that actually make up what you might call the information communication technology, it's about 5 percent of the -- as a

share of GDP. However, that underestimates lots of things.

So if we think about, for example, how this plays into other sectors in terms of the pricing effects of these actual products and services being consumed by other sectors, you can get to a number about as big as 10 percent. But if you really truly think about what does this actually touch in terms of products and services and what actually happens in the economy, you start to get to where you are talking about pretty much every aspect of the economy in almost every way.

And there's just some small examples to think about in terms of what different parts of this it touches, particularly for individuals. So this has become a very pervasive aspect of how our economy works. And we've seen all the examples of everything from big data and analytics, how we use the Internet, how we do commerce, how we buy and sell products, how we find products and services. This has become quite, quite pervasive.

But we're not done yet. One of the things that's quite extraordinary is that there are even more technologies that are still playing out that are going to continue to transform the economy over the next decade or so. The list I'm about to go through here was selected for some of the ones that we see that are likely to have the biggest impact in terms of scope -- by that, I mean touching just about every aspect of the economy -- as well as in terms of the scale of the impact over the next decade.

The first set is what you might call technologies that are related to how we use what we've traditionally thought about as information technologies. These range from -- you know, the mobile Internet is not done yet. And we still have, you know, the growth of cloud computing. But we're also starting to see, for example, some of the things that are happening with the Internet of things and some of the things that, you know, people on this board are doing and companies in the economy are doing.

And then, of course, we've got some of the new trends that we're starting to see around machine learning, artificial intelligence and also the beginning of the automation of knowledge work. We are also starting to see machines affecting other parts of the economy, whether it's in terms of advanced robotics or autonomous and near-autonomous vehicles and drones and other things that move about in the economy, as well as what's starting to happen in arenas like manufacturing.

There are also other things that are happening alongside this that are actually quite important. While they may not be purely digital in their initial instance, I think we're going to find that digitization will touch these. So think about what's happening with synthetic biology and next- generation genomics, when that's coupled with big data and analytics. We're also starting to see things happening in terms of how we think about and use energy.

So we think that these are some of the technologies that are going to have a profound

impact and digital is going to touch these. But even this is not done. We're starting to see other things too, whether, you know, it's block chain and encrypted currencies, what we're starting to see with, you know, virtual reality and augmented reality. And you could go on and on, sort of defined networks and there's a whole set of things that are going to continue to happen to transform the economy. So there's a lot more that's going to happen.

So what we thought -- what I thought I might do is to then at least focus on three areas of opportunity and challenge that are worth thinking about. One is this question about just how much -- how can the economy as a whole take advantage of digitization because the promise here, the expectation is that this is going to drive growth and productivity, as well as more pervasive innovation in the economy.

And then, second, we're going to touch on this question of what you might call the digitization of globalization. Alan alluded to

some of this around data flows. And then, of course, one of the big questions is how digitization's affecting work. Then we'll conclude with some of the -- some initial observations or some of the foundations that we could focus on that are important to get right.

One way to think about the U.S. economy in terms of the extent of digitization is to at least - - we're tempted to try and measure this with metrics and indicators in three categories. One is assets. So this is thinking through the sectors and companies in terms of the digital infrastructure they have now deployed, whether it's information technology equipment, software, hardware, anything - - and even data itself. We've thought about that as an asset.

Second is usage. So think of this as usage of technology in terms of making payments, making marketplaces work, transforming business processes. So several measurements related to usage. And then, of course, labor, which has to do with how much are we empowering workers with

digital capacities and capabilities and technology, to what extent are we creating new digital jobs -- think of data scientists and so forth.

So the picture you get -- and no need to pay attention to the fine details -- but hopefully you get an impression across the sectors, visually at least, as to which ones are the most digitized sectors and which ones are not. Let me point out at least some key features of this. There's a group at the top that we numbered one here. These are, you know, sectors that are very knowledge intensive and these are very highly digitized across the kind of metrics that I just described. And it's no surprise, you know, that it's the media sector, professional services and information technology sector itself.

You've also got a set of sectors that are very capital intensive, like oil and gas, utilities and so forth, that still have an opportunity to further digitize their assets. And you're starting to see that in pockets as some of

these companies start to deploy more instrumented or more digital aspects to what they already do in what are traditionally physical technologies.

You also have a set of sectors that, even though we may see some of them as looking digital, they have a very long tail of smaller entities that are not very digital. So examples could include even retail trade. So even though we may think about e-commerce, retail trade actually includes a lot of small businesses that may not be as digitized as we imagine. And then, of course, there's another sector of B2B sectors that could improve how they use digital technologies.

But the group that's probably worth focusing on is group number five and six. So number five, these are very large, labor-intensive sectors that have the potential to give more skills to their workers because they're very labor-intensive. And then, group number six is particularly interesting because this group is actually -- consists of some of the largest

sectors in the economy in terms of employment, in terms of share of GDP. And these are also sectors that generally are not considered as high productivity sectors.

So that's where some of the big opportunities are and, no surprise, it includes the government, health care, hospitality and construction. You may want to notice that the black dots are particularly interesting. The black dots on the chart are intended to indicate some specific examples of highly digitized entities that have emerged in those spaces doing some fairly spectacular things.

So obvious examples would be if you think about hospitality, what we're seeing with companies like Airbnb, using platforms, what we're seeing in transportation, so with car ride sharing services. So some of these not so digitized sectors, you're starting to see some fairly spectacular examples, if you like, of higher digitization. So that's the one point I'd like to make on the economy.

The second point is worth noting as well, which is as you look at these measures of digitization across the economy, we're starting to see a gap widening between the most digitized entities, whether they're companies or sectors, and those that are relatively less digitized.

So the blue part on this is looking at sectors and companies you might think of as being at the frontier of being able to use these digital technologies. And the brown, at the bottom, is kind of the rest. And you're starting to see this gap, at least by these measures, starting to widen over time. And you also see the same thing when you look specifically at businesses.

And this particular chart shows a sample of some very large corporations who -- that you might think might all be digitized. But you're starting to see big differences, even amongst them. And by the way, the established leaders here at not just the Internet companies. There are also some very traditional companies in that blue group to the far right.

So you're starting to see these differences and gaps between the leaders and the rest. So that might show I think perhaps what we may have talked about in the past as the digital have and have-nots. I think what we're starting to see are what you might think of as the digital haves and the have-mores, haves because pretty much every -- most companies and most parts of the economy now have digital technology, to some extent.

But we've seen some of the ones who are making the most use of it, the have-mores seem to do better. And what you find is that the have-mores, the ones who are making big use of this, if their companies typically see faster revenue growth, faster profit growth and if their sectors are typically you see higher productivity and levels of innovations. And also, interestingly enough, the have-mores tend to have actually faster wage growth, which is already interesting.

And also, when their companies -- these tend to be some of the companies that we typically

associate with driving disruption, who are doing these extraordinary things in the economy. So this is something that's probably worth thinking about as we think about digitizing the economy, how do we expand this.

Let me shift to a second area, which is the digitization of globalization. One of the things that's interesting, if you look at the global economy, the global economy has had a phenomenal run over the last two or three decades and certainly in terms of the flow of goods, services, finance, if you like. And arguably, some would say it seems to have stalled since the recession.

But one area that has continued to expand pretty significantly is the flow of data. And this is just looking going back to just a decade ago to about 2005. This is what you might -- what it might have looked like in terms of a map of the digital flows. And you can look at this, both flows between countries, between cities, between companies.

But this is essentially measuring kind of data flows. And look how it's changed in just a decade. So in just a decade, these digital data flows have grown 45-fold and the size of the bubble here, which aren't even done to scale, because the scale would be much larger, you'll see that there's a big pool of inter-country data flows happening in Europe. There's a big set of flows that happen in North America. And there's also a big set of flows within Asia.

And the patterns are pretty interesting when you look at country by country. What you see is you have many more countries participating if you look globally. You also see that you have many more companies participating, both large and small. And you also see individuals participating. And this is particularly interesting when it comes to thinking about small businesses, for example, because we find that, for example, many small businesses are now participating globally directly.

So we know, for example, that small

businesses, when they happen to be on these global platforms, they tend to export more. They tend to engage the world a lot more and quite directly. Zoalluded to this earlier in her opening remarks. It represents remarkable, interesting opportunities for small and medium-sized businesses.

On the question of individuals, going back to something that I think Alan mentioned, it's actually quite extraordinary to see how much directly individuals are engaging globally and enabled by these technologies. That first big circle is simply a measure of individuals on social platforms who have at least one foreign connection. And that's close to a billion people. We also start to have, you know, today, something like 360 million individuals patriating in cross-border e-commerce, whether they're buying something from another country basically through e-commerce.

You're also starting to see -- and these numbers are, in fact, in our view,

underrepresented -- the number of cross-border online students, underrepresented because simply this is tracking where people are actually paying for those services. There's a lot more where these things are done freely. Think of the kid in Bangladesh who might be using the Khan Academy to learn, for example. That wouldn't be measured here because it's free. So we're starting to see individuals engage quite broadly. And this represents a pretty exciting arena, which is why I was quite pleased, Alan, to see you point to this in some of your remarks.

Let me touch on the third and final area, which is the digitization of work. I think this is one of the more profound changes and impacts that I think we're going to actually contemplate and think very hard about.

I'm just going to focus here on two aspects of it. One is what we're starting to see in terms of how labor markets work. And I think we're starting to see many, many examples of platforms that are matching individuals with jobs.

And you're starting to see there are some platforms like LinkedIn and others where these have become places that -- where employers and employees publish or make available their own skills and capabilities.

Employers and recruiters typically go to these places to find people and the matching ability of these platforms is actually quite, quite impressive. You're starting to see quite a variety, from master all the way to skillful and, a more recent issue by the New America Foundation, starting to try and match people with opportunities.

The other part we're starting to see are these platforms for what you might call on-demand work or the gig economy. This is -- many, many words have been used to described this. But these are much more time-specific, task-specific matching of supply and demand, if you like, to fulfill particular tasks.

Now, these have been very complicated and there's a lot of work to do to make these

things work effectively. But this is a phenomenon that probably isn't going to go away. And part of the question for us is how do we help the various participants in this get the right benefits and have it work the way it worked well for everybody.

But these have been quite remarkable platforms that have grown over time. And then, of course, you've also got other types of training and recruiting tools that are starting to emerge. So this whole question of how labor markets work I think is a very important area to think about.

The other area to think about is what's happening to work in automation. And what you see here is these dots represent numerous jobs in the economy. We had the good benefit of being able to draw on some of the work that the BLS and others -- and the O*NET database have been doing, looking at jobs and tasks.

What you could be taking away from this are several things, that at least based on currently demonstrated technologies, we're likely to see automation start to happen for both high

wage, high skill occupations as well as low wage, low skill occupations.

So you'll see at the high end on the vertical axis categories that are likely to be easily automatable and all the way to the bottom where you've got tasks like the landscape and grounds keeping staff that are less likely to be automated. But you also see highway jobs going over to the right that are potentially going to be automated.

A few things I might highlight and sort of some things to take away from this. One is that at least when we look across over the next 10 years at the level of activities, not whole jobs, but activities, we're likely to see as much as 44 percent of activities -- not jobs, activities -- be automated.

However, when you translate that to whole jobs, because any one job consists of lots of different activities -- when you translate that to whole jobs, at least for the next decade anyway, we don't see that affecting more than

about 5 percent of whole jobs. Having said that though, there's a very important other thing that's going on. We actually see something like close to 30 percent of activities and about 60 percent of tasks start to get automated.

What that means is that most jobs will change. So while they may not go away, most jobs will change. And how we enable workers and others to be able to work with technology becomes very, very critical. And you might think of this as technology augmenting jobs.

Now, when you look at much out beyond 10 years, there's a lot more work to be done. And some would argue all bets are off. But I think this is at least what we see over the next 10 years.

One point that's worth emphasizing though with this question of jobs and automation, there's one area where this is going to matter a lot. And that's in the middle skill occupations. And there's been some extraordinary work that David Autor and others -- and many others have

actually done related to this. But one aspect of it is if you look historically, we've always had a pretty -- somewhat steady is not the right word, but at least a fairly low level of automation for middle-skilled jobs over different decades over time.

But if you look at what we're starting to see with these new technologies, it's quite possible that in a middle-skilled category, that rate of automation could double. Now, that could be mitigated in fact if you think about it, if the demand for the jobs goes up. Then, maybe we don't have as big an adverse effect and there's some real debate in the economics profession about the volume of work, if you like, as these automation rates proceed. And that's to an ongoing debate and discussion.

Let me conclude with some thoughts and observations of some of the foundations that may be important to get right. If we are going to fully capitalize and get the benefits of this digitization, whether in terms of what it might do

for the economy, in terms of growth and competitiveness globally, what it might do for business and entrepreneurs, but even for individuals -- we think of the individuals as workers or consumers or citizens in society as a whole.

Several areas to highlight. One is clearly cybersecurity, which has been on everybody's mind, I think, and there's a lot of work that's going against this. The other is obviously, you know, data and privacy, which has already been highlighted. There's also questions about just Internet access and governance. And the governance part in particular becomes very important when we think about this in a global context, particularly as we think about data flows globally.

An important area that perhaps hasn't had as much attention is the implications around work and wage effects. Again, people like David Autor and others have talked to this idea of skill-biased technical change and how that is

starting to affect how we think about the wage question when we have massive amounts of digitization.

That's a very important arena to think about and it affects -- it may be related to some of the discomfort, I think, that we're all feeling and noticing in our political season, as we think about what's happening to work.

A related concept, an idea to think about is this question of skill, capability and also the infrastructure gaps that we have. It's quite remarkable, and I think many of us who live in the private sector see this all the time, where the skill gaps are quite massive.

At times, when in fact employment, you know, is not where we'd like it to be, we sort of have many corporations and companies finding it difficult to find the right skills and capabilities. And then, also this question of other capabilities in the economy, how do we help some of het companies and small businesses which might not be as digitized as they could be, how do

we help them, how do we help entrepreneurs who don't always get the attention that they should.

Then, I think there's an interesting question, which I think is quite important, given where we are and the context in which we are going to operate I think as a council and as a board, which is how does policymaking adapt to a digital era, when in fact things are moving much faster. And quite often, the technology capabilities far outstrip the ability of policymaking to actually keep up.

Should we be thinking about adaptive policymaking in a different way? Should we be thinking about experimentation in a different way? Should we be thinking about evolving policy in a different way? I think there's new questions about how to do policymaking in a digital era. Then, of course, there are all the measurement and classification challenges. I think many economists have already pointed to the fact that the way we measure the economy today doesn't fully capture the benefits, the impact of digital

technologies.

And there's also all kinds of classification questions as we start to blur the boundaries, as I think was pointed out, and we start to think about sectors blurring, about jobs blurring, about worker classifications changing. How do we think about some of these measurements and classification challenges? Let me leave it at that. Thank you.

MS. BAKER: Thank you, James. I'm going to make a few comments and then we've had a few conversations with Brad and asked him to make a few remarks. And then, moderate a discussion relating to the digital trends that we might want to think about as part of our work.

And for myself, I was going to take the opportunity to do as the secretary suggested and just set this in context a little bit. Now, I know, James, you said that wasn't comprehensive. But it certainly was close, if not. And I imagine we may discuss and find a few things to add to it. But thank you for such a broad and brief, but

close to comprehensive set of topics.

To set it in context, I thought I'd add a few different things in it, one of which, to come back to Larry's comments about explorations and governance, which I think is something that's often underlooked as part of the work, but very interesting. We see this, of course, in Internet governance in general, but also in the work being done here.

Larry talked about multi-stakeholderism. And that's I think a long word with sometimes a very technical meaning, but good as a placeholder for how might we explore this area. Policymaking is a form of governance. We have the issues raised that not only the Department of Commerce but perhaps our overall governmental structure doesn't have a center of gravity for addressing something as fundamental as digital economy.

And so, as we work those things out, those are long processes. And in the meantime, either as immediate activities or potentially as experiments for the future are some

experimentations in governance and policymaking. And so, multi- stakeholderism could be a good sample or example to look at. How would one gather people who are affected? Try to look at issues -- maybe in the sense of design thinking, as it were, try to iterate, prototype a potential solution, try it out.

You know, certainly the other stakeholders in the process have more freedom to try than government, more freedom to try, more freedom to fail, more freedom to iterate and try version 2.0, 3.0 or 4.0. And so, I think this question of explorations in governance and how we interact and how we might test out policies could be a fruitful area. Certainly from the Internet area, which I have some experience with, it tends to be fruitful in two particular circumstances. One is where the problem is generally shared and it is something that everybody wants to solve.

The other is a little trickier. It's when you have business interests that may be competitive, but for some reason or other have

potential solutions to this problem needs to happen now. So we have immense experience with that in the standards bodies, for the World Wide Web, for example.

Sometimes it was obvious there was a problem we all needed to solve. Other times, like Brad and I could probably tell stories that Netscape and then Mozilla and Microsoft would have really quite different interests. But a number of really important solutions emerged out of those kind of conflicts and trying different implementations. So that's one area.

A second area of context is -- that I would like to explore a little bit is the individual experience. James has described -- and your comments are really about the changes in jobs and the change in the economy that automation might bring. It is an immense period of change. And human beings typically are nervous about change, whether or not it's positive or negative.

So huge amounts of concern, plus change in jobs and that means loss of jobs for some and

change for as many, you know, as can be managed. So in the context of individual experience, so there is such a need for opportunity and hopefulness and whether our, you know, educational institutions can adapt fast enough is a big question.

And so, once again, I think there's a real question about what sort of explorations and change could be managed. There are certainly priorities and policies for the department and there may be a great deal to do there. And perhaps the work of this board might include are there explorations in whether it's skills or capacity or wages or work that might be possible to run.

And I think the final piece of context I'd like to add is the global aspect, in which, you know, the United States has clearly been the leader in the digitization and technology.

It's also clear today that there's at least one other market that is large enough to develop and sustain massive economic growth and

change without the United States. That's China. It is doing so. I think it's -- I personally don't -- am not as -- I think it will take longer for Chinese innovations to fundamentally affect the rest of the world because that economy has such characteristics, both in language and the use of the Internet, that the language actually drives different forms of input, different visuals. But it is an economy with a power of its own.

Probably, you know -- so open question, whether we integrate with it, whether we fragment with it. And that I think has a very large business effect on our policy and our policy will need to consider that as well. And certainly, you know, the Arab-speaking world is large enough to maintain its own really active and dynamic digital or Internet economy. That hasn't -- clearly hasn't -- it's not as integrated as China as one nation-state. But it's also something to actually consider.

So the final piece of context that I'd like to leave us with is that the open borders of

the Internet will bring a different degree of global interaction into the priorities and policies. And our ability, I think -- and the ability of any nation-state to isolate itself and still remain part of the world economy is really complex.

So that's a big challenge. I think it's also an area where the United States can -- you know, has in the past and can here provide really exciting leadership. And so, we have the opportunity to do that, provided, of course, we can solve the security and trust issues, which our leadership in that area has suffered in the last few years.

And so, one other topic is the degree to which we have the interest, will and ability to continue to lead in that area. And so, with that, I think because we've had some conversations with Brad, I'm going to ask him to comment. And then, we'll have the kind of general discussion phase of digital trends and topics.

MR. SMITH: Sure. Well, thank you.

Well, first of all, James, I thought it was a terrific summary and the report itself was invaluable I think as a foundation for everything that we need to think about here. I'd say certainly for me it highlights two of what I think are the fundamental questions that we'll all have to grapple with, namely where are the jobs of the future going to come from and who is going to fill them.

When we think about what's going to happen to jobs, it's readily apparent that some jobs are going to go away and some new jobs are going to be created. You know, I think it offers some solace to recognize that this has been going on for about 150 years. It's not new and we can learn some things from the past.

Personally, I'm struck by two photographs I've seen recently of the same intersection in New York, on Broadway. One was taken in 1905 and one sees street cars and horses and there's not a single automobile. Twenty years later, at the same intersection, one sees street

cars and automobiles and there's not a single horse.

In 1905, a quarter of the country's agricultural production was used to feed horses. There were tens of thousands of people in New York who had jobs simply to feed and clean up after horses. All of those jobs were gone 20 years later. But there were lots of people who were building, maintaining and even driving cars, all of which required new skills.

So I think that we face a lot of daunting challenges. But it's helpful to just have the perspective that we've been through this before. Certainly when you ask where the new jobs are going to come from, it's on one level impossibly I think to know in advance, but on the other hand easy to predict certain things. If it's all about digitization, then the jobs of the future are likely to involve work with data and digital technology, regardless of what part of the economy one is in.

And as your report, the written version

pointed out, we even have small businesses basically functioning as micro-multinationals using platforms like eBay to sell their products around the world. So I think the big question in a way is how will we help the American people fill these jobs of the future.

And I was very struck by one experience I had last year, last June. I was in a town in Kenya called Nanyuki that's about a hundred kilometers north of Nairobi. It's right on the Equator. Only 12 percent of the people in this area even have electricity. But I was visiting an Internet cafthat was connected through a super-Wi-Fi or white spaces technology and that had a solar panel for electricity.

And I met a very sharp fellow in his early 20s who had a laptop computer. And he was sitting here at this hotspot. And I asked him what he was doing. And he showed me that he was basically using this place as his office and he was providing technical support for a U.S. startup and he was providing technical support to

Americans. So there he was in Kenya, in a place that had no broad electricity, working for a U.S. startup, supporting customers in the United States.

What it shows is that the jobs will frankly go to wherever there are people who can do them. And if we want our own people to fill these jobs, we're going to have to equip them with the skills that are needed.

And just as there was a time when first there was no universal education in the United States, and then there was, but it was only until people were, say, 12 years old, and then over time it expanded to today where we expect people to go to school until they're 18, you know, we may really need to focus on a future where people go to school until they're 20 and then stay connected to learning throughout their lives. And as much as anything else, I think what we need to grapple with is how to ensure that the jobs are created here and filled here. Otherwise, the future is going to be far more daunting.

MS. BAKER: Would anyone else, you know, like to comment on the digital trends and the scope of things we are looking at, might look at, that go into our work?

MR. THOMAS: I too think it was incredibly insightful. You know, one of the things that strikes me as we look at the many, many issues -- and I'm reminded what the secretary said about sort of focusing on a few -- is that how do we actually go about thinking how do we enable these things, how do we actually enable the job creation, address some of the trends, but at the same time, minimize the unintended consequences.

You know, one of the things that always stands out to me is that I think that how difficult it is to participate and the barriers that you have -- and when I look across our current government right now, I see lots of people attempting to address lots of different aspects. And when you actually have focus and energy and attention and lots of people trying to solve it,

sometimes you end up with complexity.

And so, one of the things that I think we should just be mindful of as we go through this is how do we, as much as possible, come up with solutions in the broader context that simplify because I do think complexity is the enemy of participation and the enemy of accessibility.

MS. BAKER: Well, that's a fascinating phrase, since participation is such a big aspect of the digital economy, whether it's from user communities to -- at least from open source, which big parts of the Internet technology came out of. And so, that's a really interesting piece. Complexity is the enemy of participation. Fascinating.

MS. KATYAL: Corey's comments made me think about something similar, but from a different angle, which is just about the design of law. And when you were doing your wonderful presentation, I kept thinking about how law impacts digitization and how digitization impacts law. I mean, as an academic, one of the things

that I often try and look at is to find data about how the design of legal entitlements affects things like innovation.

So if you have very high trade secret protection, that impacts the mobility of labor markets. If you have significant uncertainty in the copyright world, that affects lending and, you know, how people want to invest in disruptive technologies.

And so, one thing that I wish we had a little bit more data on actually was the question of kind of how the design of legal entitlements impacts innovation, but also this question of the interactivity between different agencies that are doing rulemaking and common law. I mean, the ES -- the whole privacy shield issues came up out of a litigation case and so how those things interact, I think is, such an important thing for us to study and to think about.

MS. BAKER: You know, you mentioned briefly the question of intellectual property protection and labor, which I also think is an

area that is underserved. It's, you know, my personal theory that Silicon Valley is hard to replicate because of California's labor law, which allows employees to leave a company and maintain in their head the knowledge we've learned and go work for a competitor the next day. It's very, very hard on management and I've experienced this as well. It's very, very hard.

But the history of Silicon Valley, starting from semiconductors, is exactly that. And certainly I know when we hire people and need to wait six months or a year, it's a real drain on innovation. And so, as to are we interested in innovation, you know, or is the ability of an individual person -- i.e., labor -- to be able to move important or is the ability of management to have consistency important or just have such huge impacts.

Yes? And I might ask, you know, James' presentation, does anyone have any thoughts on anything that wasn't included in it, that we might like to think about? I'm going to go through a

series and just see if we've covered the scope of things here, a series of questions.

DR. GOOLSBEE: I guess I have one question about the distinction between what can be digitized and what will be digitized. Is the presumption that the cost of automation is becoming so cheap that you would just automatically replace people with machines?

And I give the example, there was a guy that was an economist in Chicago and his wife worked at the World Bank and was the case officer, whatever you call them. And her assignment was in Sri Lanka. And this guy was an economist, set up his teaching schedule so he could go to be wherever she was, you know, when she would do it. So he spent the month in Sri Lanka. And he said there are many things in Sri Lanka that are automated.

But they are not electric because, you know, at that time there wasn't a lot of electricity. And he said if you go to the grocery store, they have an automatic door opening. But

it's just two people who pull the door open as you walk up and then they shut it. It's just the price of labor was so low that the store owners were like you'd be an idiot to install an electric mat to open the door. I can just pay two guys to pull the door open.

You know, so that, while being a trivial example, if you looked at your list, where it said, you know, 30 percent of these job functions could be automated, are you conceiving that it's going to get considerably cheap to automate them and they would rather have machines do it than people?

DR. MANYIKA: Thanks, Austan. That's a very important question and actually I'm going to split it into two parts. So the first question is will everything that can be automated be automated. The answer is clearly no.

And in fact, one of the things that's quite interesting is that I think we always imagined that it would always be the low-skilled, menial tasks that'd be the first to get automated.

When you throw in the economics of that, it's actually not likely to be the case because what happens at the low end, where the work is mostly physical and manual, so even though automation technology has made huge progress, we've made relatively less progress on physical machines working in unstructured environments and automating that is actually much, much harder.

And by the way, even if we could, those are still physical machines that actually cost something. The surprising impact of that is that the work that is actually easy to automate is actually most of what we all do, which is all the thinking work because most of that is actually software. It involves very little physical machinery. And by the way, those are mostly algorithmic things.

And so, no surprise that most of the automation that we've seen has been happening actually in the middle-skilled category, not so much in the low-skilled category because in the low skill, you've got both complexity of the

technology and the economics of doing it, per your door example. So that's one thing. So I think that's why, you know, the deeper issue is mostly in this middle-skilled category.

And then, of course, as -- you're an economist, right -- of course the labor supply at the bottom end is going to be much larger and more malleable. So even though we may not automate those jobs in the low-skilled category, there may be different wage effects that might not be as attractive. So even though those jobs may still be available, the wages for those may not be that great because of the abundance of labor. And so, it's a much more complicated question. But hopefully, that gets to your point.

MS. BAKER: Could you say just a little bit about -- you also said -- you said middle-skilled and then high-skilled. Could you say a little bit more about that as well?

DR. MANYIKA: Yeah. So if you -- most of where the progress in machine learning and artificial intelligence and so forth has actually

been in things that are repetitive, but tasks that we've typically paid well for. So accountants and clerks and some parts of the legal profession, discovery and so forth. That's where most of these technologies have actually made the most progress. That's also where, by the way, the scarcity of the labor and the workers to do that is much higher than the low-skilled jobs.

So the tradeoff to then choose to automate is much easier to make at that level. And also, in some cases, it's not just a cost issue. It's that when you apply these algorithms, the result is actually better. So it's not just you're doing equivalent human level performance. In some cases, you're actually getting better results. So I think, you know, we're going to -- so while we've worried historically about automation at the low wage level, I think the middle-skilled category and maybe even the high-skilled categories are going to be an interesting place to watch.

MS. BAKER: Well, I remember my time

doing discovery and reading documents. So I can imagine that. You know, thinking to the experiments in governance, I'm wondering, Karen, since the IEEE is also an expert in different forms of governance, if -- not to -- well, I guess I will put you on the spot -- but to see if you have any thoughts about that or anything you might add on that topic.

MS. BARTLESON: So two years ago, IEEE started what we called the Internet Initiative because we recognized the exact same things that Larry talked about, the same focus of commerce, the need for trust in the Internet that was being eroded, the need for security and privacy and Internet governance as well was changing. So the program is designed to bring technologists to the policymakers so the policymakers can make better decisions.

For those of you who don't know IEEE, we're the world's largest professional organization of engineers. We started as electronic and electrical engineers, but we now

span pretty much every discipline of engineering. And one of our most powerful -- well, I say that from parochial interests -- but one of our most powerful activities is standards.

So we've worked closely with W3C and ISOC and IETF to develop what we call the open stand principles for market-driven standards. And some of this helps us to say that it's the market that drives the standards, not the government, which is a very interesting parallel model.

But anyway, for the last two years, we've been holding forums in various parts around the world to discuss the issues like we're talking about today and see how the technologists can bring some reality policymakers.

So in Europe, the right to be forgotten, or just erase me from the Internet. Well, technically speaking, that's not so easy to do. You can go to the Internet Wayback Machine and see what your website looked like in the '80s. It's really an interesting experiment. So anyway, we're trying to help bring the reality to the

policymakers to help us to have the right decisions all around the world. I hope that's what you were asking.

MS. BAKER: (Off mic, inaudible)

MS. BARTLESON: You know, and I was really glad to hear you talk about China. Our past president of IEEE recently went to the China Internet Forum. And the discussion there was that, you know, China has very strict policies about Google's not allowed, Facebook's not allowed and the government controls a lot of the information flow. They see that as a security issue and a privacy issue. They see that as protecting their citizens, whereas we, from the outside, see it as walling off their country and preventing commerce and preventing the flow of information.

So the philosophy is completely different thinking. And at this point, there's no right or wrong. But it's something we need to understand.

MR. RUH: So James, one question. I

think you did a great presentation. And the thing is that when you look at the ability to actually capture the opportunity, most of it is actually being captured on the consumer side, not the industrial side. And in fact, industrial productivity has gone from a traditional global 4 percent down to 1 percent in the last five years. And so, there are natural barriers that are causing this to not occur. And I think the promise has been there probably even for a decade, yet is not moving as fast.

We see two things, and I'm just curious if there are others. One is the cost of technology still has not reached a point to where the economics work. I think it works on the consumer side because people like some of the coolness and social factors, not necessarily the cost effectiveness. And so, one question is where do you see the cost effectiveness of this for widespread adoption beyond a consumer environment.

I think the second think is talent, that these technologies are more complex than

traditional manual approaches. And they require new kinds of skills. And as a result, you know, we have a large number of unfilled positions globally, especially here in the U.S. We see ourselves having to bring in H-1B employees to fulfill those, which is a limitation. And we see the growing of native talent inside the U.S. as slower than we'd like.

Do you see either of those getting solved in the near term, and what other barriers would you see that we have to be concerned about?

DR. MANYIKA: Bill, thank you. I was actually hoping you were going to solve the industrial benefits part of the question, given what you're doing. I say that in part because one of the things that's quite interesting on the productivity questions -- and there are enough economists in the room that hopefully you can all chime in on this -- it's quite remarkable, you know, how we used to have the Solow paradox in the '90s about, you know, computers were everywhere but we couldn't actually see this in the

productivity results.

And I remember doing some work with Bob Solow actually on that question in the early 2000s.

and one of the things that we concluded from that work was that we saw the big benefits in the economy broadly in terms of productivity when a few things actually happened. One was when we started to have the very large sectors in the economy actually start to make big gains and big -- you know, process changes. That's when we actually saw the big change -- the numbers were big enough to be noticed in the broader economy.

And now, arguably, if you take the heat map that I showed, we haven't seen yet digitization really impact the really, really large sectors. If you remember on that chart, if we put the numbers the size of the sectors, most of the ones that were red were actually the really large ones, by the way. So arguably you could say we've yet to see the full benefits of this round of digitization because we have not really started

to move the really, really, really large sectors in the economy. If you take that historical argument.

I think the question on the consumer question -- and I think it is the case -- I think the consumer question represents some interesting conundrums. On the one hand, you know, many economists, Hal Varian and others, have argued that we don't measure it properly. There's a measurement part of the question.

But the other part is that most of these technologies, the good thing about them is they have conferred huge consumer benefits -- in an economist's terms, a kind of consumer surplus in the sense that the products and services that either are free or very, very cheap, which is wonderful if you're a consumer, challenging if you're a company and a business wanting to make money and you want to measure things that you can actually see as GDP.

So there's that part of it too. So we love that as consumers and users of these products

and services but probably don't like that as businesses from a monetization standpoint. I think that's one of the issues.

I think on the talent question, this one's the harder one because on the one -- I think the signals have been there for a very, very long time that there are benefits to more education, better education in terms of wages. And yet, somehow, the system doesn't respond very well.

So either somehow we're not making education interesting or we're not educating enough people, creating the right incentives. So that's an ongoing problem that's been the case for a while. But it may actually be about to get worse, which is it may be that we're going to need to rethink what we actually train and educate people to be able to do.

So one of the interesting things, if you take the arguments and the evidence from machine learning and AI is that most of the things that we - - that are the center of our education policies and training are in fact the things that machines

can do very easily -- do mathematics, calculate things, memorize things, remember things. Those are the easiest things to automate, by the way, whereas things like creativity, other kinds of thinking, those are slightly harder things to do.

So there's a question here which -- how is it that our educational training systems are going to evolve, both in recognizing what the technology can do, but also what's actually needed. And it's no longer as simple as teach everybody math or teach everybody the facts or teach everybody history. Yes, those are important. But those are the things that machines can do very well as well.

MR. HANRAHAN: So I think that your point on consumers benefiting the most, I think the consumer surplus is absolutely right. I think that consumers are leaning towards these products, these technologies because it's giving them something they didn't have before. I think one of the things that's less talked about is what it's giving the supply side. So whether it's Uber,

whether it's Lyft, whether it's Handy, whether it's TaskRabbit, we're giving people incredibly flexibility to work in a way they didn't work before.

And you put that together with the fact that you're going to see such a huge change in jobs over the next decade, which whether it's 60 percent or 30 percent, it really doesn't matter. It's just such a large number anyway. I think there's probably three things that we should really press on.

The first one has been talked about. It's education. The second one I think is this idea that we need an experiment framework that allows us to go much, much further than we've gone before without feeling this risk of failure. And the third one is I think a topic that's a little more controversial. And it's this idea of how we classify work.

So all of us are employees of one organization or another. And the legislation that that, you know, pertains to goes way back to 1938.

And there's this conversation that we're having around what does it mean to be an employee versus a contractor and what that actually means as you look, you know, a decade forward where a large percentage of jobs are going to be automated. Should you really have a full-time -- a full-time job and what does it mean if you're working across three or four different platforms?

DR. TELLADO: A slightly different topic, but there was mention of consumers and I feel compelled. I do think consumers are enjoying the gadgets and the devices. But I think one of the things I don't want us to lose sight of is that there is so much burden falling to consumers about the marketplace and about these devices.

And we have to ask ourselves about the interoperability of these devices across brands. And that ties us and brings us right back to this notion of how important it is, the trust side of this. And so, I just wanted to put a marker there.

SEC. PRITZKER: Yeah, one question that

-- or issue that we've been grappling with is this notion of products today are developed and used equally by consumers and businesses. And should the rules of the road be the same, given these different users, because by virtue of having one set of rules, we're creating some real challenges. And there's not a line at all that -- and so, for example, what's the right of privacy for my personal phone versus my Commerce phone. And one could argue that maybe they should be different, right?

But right now, they just look the same. They're just different colors so I can keep track of which is which. But this is I think -- you know, these products were often developed as consumer products. But they're tools that we all use in our day-to-day business. So that's a very important thing to keep in mind, and a question I would just ask, if there's some thought the group would want to have about that division. Is that an important division or not?

MR. THOMAS: I just had one -- I just

had one thought there. You know, it's interesting. We talk a lot about how innovative companies and new companies are able to disrupt or get their position. And I think a big part of it though is that they've changed the model in some ways. For lots of I think history, you actually had to have a large salesforce that had lots of cost and lots of complexity to actually penetrate.

And I think this fact that you're actually talking about or being able to find ways to access and see and get in on the consumer side or on the individual side and then expand your footprint has been one of the drivers, that it's allowed people to innovate.

And I think that part of the complexity, I think not just from a policy perspective but from an experience perspective is how do you actually maintain the ability to actually have low friction or for the best technology or the best solution, to deliver the right experience, but then address some of these issues of trust and complexity to come so that then you actually have

these blurring of lines that happens all over the place. And I think that's something that technologists and innovators struggle with once they've got sort of like in the position to get inside.

But I think lots of the reasons that you've had some of the flexibility and the un-adoption is that you no longer necessarily have to have a highly experience salesforce to actually go penetrate institutions and organizations. And I think that's been a net-positive effect.

MS. BAKER: (Off mic, inaudible) -- sorry. I'd like to thank James for kicking off the discussion, for a broad ranging set of topics that we can keep in mind as we follow the senator's comments with a discussion about how we might focus on our own work going forward. And with that, I'm going to turn it to Zoto make an introduction.

MS. BAIRD: Thanks, Mitchell. That was a great session. One of the things that we've talked about pursuing as we do our work is to

bring in others who have been thinking about these issues for a long time or more recently with intensity to inform us.

And we have the privilege this morning of having Senator Mark Warner with us, who has been collaborating with a number of his colleagues and probably many of you around the table, including the Commerce Department, to think about what these transformations in the economy mean for the people of this country and what the role is of Washington to engage with that. So if I may, let me invite Mark to make a few comments.

SEN. WARNER: Well, thank you, Zo And Secretary Pritzker, thank you for putting together this panel. I apologize about kind of leaping in. If you were mid-conversation, I'd be actually happy to wait a couple moments and then -- and then add or let me go through three or four of my points, and then if time and interest allows, would love to be able to sit through -- I know you've got a break coming up a little bit later -- but would much rather kind of participate in the

flow of the conversation.

Three or four items that I wanted to mention, and it is true, with the help of people like ZoBaird and others around the table, this is a space that I've gotten -- I'm very interested in.

Some of you know my background. I spent 20 years in the telecom and IT business and brings a little bit of experience, at least relative to my colleagues, in this space. And I think it's an extraordinarily exciting -- but it raises a whole host of new policy questions. And let me kind of go through in no particular order.

One, I'm amazed as I travel Virginia and the country -- as we think about the digital economy and what it means -- how many Americans still don't have access to broadband. I think that we have -- those of us who live in urban and more suburban areas think this is a problem of the past. It is not.

I think about in my state, wide swathes of southwest Virginia, both topography and the

failure to have the incumbents have a focused distribution network, you know, and there is a huge understanding, I think, that -- that most communities, that broadband is not a guarantee to success, but the failure to have broadband means you're not even going to be on the map. And I know this is -- we've had lots and lots of other governmental efforts, private sector efforts.

I still think we lack a good how-to handbook for local-based communities on how you can aggregate enough demand to bring particularly last mile providers, most of which I think will be wireless, to communities in terms of access. Access is number one.

Number two is the whole question of security. As more and more of our devices have enormous security challenges and opportunities, as we think about databases being broken into -- there's not a -- again, a week that goes by, if I'm out around Virginia, that I don't hear still from OPM, both current and former federal employees, concerns about their personal data

being hacked into.

I still feel like we lack a single standard, kind of an underwriter's laboratory, Good Housekeeping seal of approval around security. I think about this from the policy standpoint, particularly as we move into the Internet of things.

I don't think most Americans have any sense of what is about to happen as we think about all of our devices, from appliances to autos to refrigerators, you name it, all having sensors connected to them raises a whole host of issues around security, around privacy, around questions about what happens in the aftermarket if you found out your device has got a bug in it and somebody's hacked into it, whose responsibility does that bear? Again, policy questions here, but ones that are not on most members' kind of front-of-mind in terms of Congress.

One of the things, because of the encryption debate, but not necessarily entirely driven by encryption, more encryption and overall

digital security. Mike McCaul, the chairman of the Homeland Security Committee in the House, he and I have put together legislation that would say let's put together a commission to try to look at these issues around digital security.

Now, I know and I would tend to agree with the premise that usually encryptions are congressional punts, where there is a willingness to kick the can.

I for one, again, who have spent 20 years in networks and six years on the Intel Committee, know though that if we rush to a top-down, legislated solution, particularly one that would legislate some form of a backdoor, that we raise a whole host of issues around security, around maintaining America's innovation lead, as it will push most of the bad guys, both criminals and terrorists, in other words, don't form based on hardware and software.

But trying to elevate up the security issues -- and I don't know whether that exactly falls within the purview of this commission. But

we need a common set of facts. If we can't get this legislative commission together, where it is broad- based and bipartisan and we've got lots of support from intel, law enforcement. I've been a little candidly surprised at tech who kind of are in one day and out the next day on this. But security is going to be a huge issue.

And then, finally, the one where many of you around the table I've engaged with, and that is the whole changing nature of work that is being driven by this digital economy. Some of you have heard the analogy I've used, and it was coined by my friend Lindsey Graham, who I'll never be as good at political phrases as he is.

I spent this -- I spent an hour in the car with Lindsey recently where he had to listen to my whole, you know, on-demand economy, sharing economy pitch. And I talked about the transformation of work and how, you know, we've moved to more and more contingent work and people are being able to monetize their time and their energy and their assets on a real-time basis and

great freedom and flexibility, but enormous challenges.

And Lindsey said, well Mark, what you -- you know, this is how I'll explain it to people in South Carolina. What you're telling me is you're saying that work is a little bit becoming like the way we used to have to buy cable TV. You used to have to buy cable TV and you had to buy the whole package with a hundred channels, even though you didn't want the hundred channels. You just wanted ESPN and HBO. But you had to buy the whole package to get the channels you wanted.

And now, more and more, people are buying a la carte. Work in a certain sense is being broken into that category. Employers used to have to buy a whole person for 40 hours a week, 50 weeks a year to get the skill sets they needed on an intermittent basis. Increasingly, we're finding ways that work can now be purchased on an as-needed, skill-driven basis. Enormous upside for consumers in that, enormous driving down of costs.

I've found a great number of people who are workers in this on-demand economy who love the freedom and flexibility. But from a policy standpoint, this raises as many fundamental questions as anything I think that those of us on the elected side will have to deal with. This really shakes up at its core the social contract that was derived in the 1930s and the 1940s.

As more and more work becomes contingent - - and Austan and I have talked about this a bet -- and while the gig and on-demand workforce is still relatively small, the contingent workforce, which now numbers somewhere in the, you know, 30 to 40 percent, depending on the way you want to cut it, is more and more corporates starting in the '90s decided to take everything that was non-core to their function and outsource it, if not literally outsource it outside the country, at least outsource it from being within inside the corporate structure.

And all of that work that's been outsourced, whether it is back office work,

whether it is your janitorial or your feed services, really operate in a totally different set of rules and regulations.

And I think our binary view of employment, 1099 versus W-2, one coming with a whole set of social contract -- unemployment, workman's comp, disability, health, retirement -- other with basically no social insurance, we're seeing kind of happen underneath the top line of the economy a massive shift to this contingent workforce, which again, at 35 percent I think is the most accurate number and growing exponentially -- from an economic free-rider standpoint, if we end up with 60, 70 percent of the workforce in some form of continent, whether we call them on-demand or not.

We have a huge challenge with our public entitlement and social safety net programs because if no one's been contributing to social insurance along the way, workers and employers, when bad things happen, those people fall upon a safety net that's already strained.

My hope would be -- and I don't think -- my hope will be that Congress will not top-down legislate and stop this innovation -- is that we can see more innovative models being tried out in local communities on a regional basis, on a state basis. I commend what Uber and the machinists did a week ago. I think that is just one model.

My hope, and I know people around the table and I have spent a lot of time talking about this -- you know, whether we can get more models to try out -- Secretary Pritzker, one of the things that, you know, we've talked a little bit here. There is great fear amongst the companies about trying anything in this space, model -- and in terms of benefits because of the fear that it will be used against them in our 1099, W-2 world.

Secretary Pritzker, if we could get some more in effect, you know, regulatory sandboxes or ability to try innovative pilots, I think we would go a long way. I'd close with this. You know, as one of the things that if we are going to move to this new model and beyond the two classifications

of work and as we think about a third or a fourth classification of work, there's two parts that at least where some of the work we're doing at the Aspen Institute under the future of work project that we're focusing on.

One is portability of benefits, making those benefits attach to the human being rather than being connected to the workplace.

But two, and this is again where a lot of the companies -- maybe not in this forum, but elsewhere could I think help us think through these items -- if we were to be able to suddenly wave the magic wand and say everybody in the contingent workforce, on-demand or not, is going to have portable set of benefits that travel with them, that is going to have some kind of joint contribution coming from the employer and the worker, before we simply port over from the 20th century unemployment, workman's comp, disability, health and retirement, those are still big buckets.

Before we simply port all of those over

to the 21st century in a portable benefit framework, what I would hope we would also think about is can we reinvent what that social contract would look like.

The last point I'll make is that one of the things that we've discovered as we started with the on-demand and then spread to more contingent workforce and then really kind of dug in with some of the FinTec firms and some of the more traditional financial institutions, one of the challenges I think most Americans face right now that really is exponentially different than it was 30 or 40 years ago because if you think about work, it was 40 hours a week, 50 weeks a year.

Whether you made a little bit of money, a medium amount of money or a lot of money, you had predictability. If you have now a workplace which is much more contingent and your income volatility is exponentially higher -- and JPMorgan's done a lot of good work here -- our current benefits package is not meant for a universe of Americans who are going to work --

even if they make enough money -- in an extraordinarily income-volatile situation.

So are there tools, particularly coming out of FinTec, that can income-smooth, that can help create that emergency $400 that can only be used once a year without diverting people into payday or car title loans or into these debt spirals that people get into. All this is possible. But it is going to require -- it is going to require making sure that everybody has access. It is going to require thinking through this transformation in our economy and thinking through the security issues.

And then, finally, it is going to require, as people think about the changing nature of work, I hope we end up with a place where there is social insurance, where there is a 21st century social contract and that part of that social contract is going to entail some level -- some ability to have some form of income smoothing because I don't think we're going to go back to a predictable income stream the way we had in the

20th century.

So I know I've bounced around a little bit, but would love to sit and listen or have people respond. I guess one thing that I would love to hear from the panel, if we've got a couple of moments, is, you know, what should Congress do over the next few months, recognizing Congress is not going to do much over the next few months. But you know, what should Congress do and what should Congress not do, you know, in the short term in this space.

SEC. PRITZKER: Senator, first of all, thank you very much for attending our meeting. I think you've provided some valuable insights that frankly some of which we had not focused on as of yet.

If you look on the board, or on the screens, this is the sort of framework within which Commerce has been acting and this is sort of a framework against which the group has been reacting to say is this an inclusive enough agenda or not. And we don't pretend at Commerce to think

that we have a fulsome enough agenda. That's why we created this working group, which is very helpful.

I think that access has very much been on our mind. I think Brad suggested that our access agenda should also include folks with disability, so not just coverage, but also that we need to include folks with disability. As it relates to security, this is absolutely sort of in the area of our trust bucket.

And it's a huge issue that your point about there is not a Good Housekeeping seal or a how-to book is exactly right. We have -- the Cybersecurity commission has made one of it -- which is not this group, but another -- that we support has made that one of its to-dos is to come back with a set of suggestions about how do we measure appropriate cybersecurity and security. And this doesn't mean it's not a purview of this group. I'm just saying it's also in their bucket.

The point of the changing nature of work, we spent a lot of time talking about that.

But you brought an additional dimension. We've spent a lot of time talking about the need to change education, the realization that work is changing. But your point about the social compact and the social safety net is one that we had not focused on. And I think that really is an important dimension to be added to the work of this group.

One of the things Larry Strickling, our assistant secretary at NTIA, has really championed is the whole multi-stakeholder process of coming up with ideas and solutions in the digital world. And that might be a way to reinvent the social contract is to really engage in some form of multi- stakeholder approach. So those are just a few reactions to your approach.

SEN. WARNER: Can I --

SEC. PRITZKER: Sure.

SEN. WARNER: Just two questions -- just a couple of quick comments. On the Cybersecurity Taskforce, and I've spent some -- you know, quite a bit of time with Tom Donilon on this and I

commend the president for moving forward on this initiative. My understanding -- and I could be wrong -- of what the president's taskforce is really focused on is more kind of cyber-hygiene for USG. You know, and terribly important and obviously in a state like Virginia, exponentially important.

But questions around, you know, getting ahead of the debate on as we move to the Internet of things, at least thinking about market and aftermarket. If you've got software in your refrigerator and somebody hacks into it two years after the fact, whose responsibility is that going to be? I'm not saying this commission needs to come up with that answer. But I don't think most Americans or most policymakers that I work with even know what the Internet of things is.

And then, three, this -- the current debate about encryption is -- as someone who feels like I'm hanging on by my fingernails trying to understand all of the kind of ramifications of this, you know, God forbid another incident,

particularly if the bad guys use encrypted technology, which more than likely they will.

It gets me to the fact that there's, you know, a couple thousand new apps a day added to the iPhone store and over half of those are foreign and most all of them are encrypted. For us to presume that something won't happen and it won't be using encryption, if we don't kind of lay out proactively some of the set of options, there will be political solutions offered that I think may sound good, may not make Americans safer and could do enormous damage to our -- you know, America's long-term economic lead in the area that we are still the world leaders.

I know it's not perhaps the purview. But it's -- boy oh boy oh boy, it's coming and it's been very disheartening that, you know, because the current -- just because one set of litigation has gone down, that many people have kind of buried their head in the sands again. And I say that as a friend of the tech community. But it's really been pretty disheartening to see

people retreat from the debate.

And then, on the question around how we get it right with the social contract or about social insurance, you know, we will have -- I think the worm -- editorial comment here -- the view around the gig and on-demand economies, I think the public's mood is shifting. It was all very positive a year ago, six months ago. I'm not sure it's as positive anymore.

And notional ideas of let's say let's just put everybody back into a traditional 20th century box in terms of classification I think is a much higher -- much higher chance today than it was even three months ago. And my fear will be if we don't try some models, if we don't try some -- and again, Madame Secretary, you and I have talked about this, you know, before.

I know there are even internal discussions within the administration where we fit. If we can't try out some new models, then policymakers are going to be left with I think only two choices. We either put everybody back

into a 20th century context or we just say we're not going to have any social insurance at all. And the ladder of everyone for themselves I just don't think is going to fly.

MS. BAIRD: The issues you're raising, which, I think you know, are very important, I would mention too that Senator Warner's working on these on a bipartisan basis. He's leading his effort with Mitch Daniels, who was head of OMB in the Bush administration, and governor of Indiana and now present of Purdue.

These issues are really a piece of a broad set of policy issues for which we don't have a very good means of deciding what we even value as a country, let alone reaching conclusions on those policy issues.

The issues you raise about portable benefits and the social compact and the classifications of work, there are issues Mitchell raised earlier about positions America might take in the global discussions about data flows and the compartmentalization by country of the Internet.

And so, I think one of the challenges for us will be to see if we have a way of thinking about how Commerce can lead a development of the current values in a very divided country in order to develop consensus around positions, let alone -- or broadening of consensus around positions that we even know what direction the experiments might go or what direction we might want to seek for policy.

Brad, did you want to make a comment before we move to the next part of the agenda? Because I do think we need to move on pretty quickly. But I know you were --

MR. SMITH: Well, sure. I'll just offer two brief comments. First, I personally -- since we're all in our personal capacity here today -- think that the legislation that you've introduced with Representative McCaul is extremely important. The notion that we should take a knotty issue and develop a common understanding of the facts before we develop an opinion on the outcome is perhaps somewhat unconventional this year but is

nonetheless laudable. And it's actually important. And I think increasingly people are looking at it that way, as something we need to do.

But second, I did want to build on just your comment and then the prior comment. It's interesting to see how much the future of commerce depends on the nature of labor. One's reminded -- or at least I'm reminded by the fact that when this department was first created, it was the department of commerce and labor and then they were split. And I think we really only have three choices.

We either create a new model for the 21st century or we fall back on the model of the 20th century or we fall back on the model of the 19th century, because if there's no labor law at all and there's no Social Security at all, we're back in the 19th century. The truth is neither of those outcomes make sense.

And I think one of the disconcerting things for those of us who work in the tech sector

is the degree to which right now the debate seems to be about the application of 20th century law to 21st century practices. It's like watching people trying to pound a round beg into a square hole. And when it doesn't go in, they just pound harder.

And the truth is I don't think anybody really knows what the new model should look like. I think we can start by asking ourselves what values and principles exist that we really regard as timeless. You know, we want, I think, people to work in a safe environment, be healthy, get a decent day's pay for a decent day's work, to have the ability to retire at the end of their careers.

But we have to ask how we apply those in this new age of work. And you know, I think that is a very good question for us to think more about.

MS. BAKER: And I have one quick question, and it is on the encryption debate and your comments about the tech industry in particular. I'm from Mozilla, by the way. And it occurs to me, on a practical level, in this trust

bucket here, we might consider whether we -- whether it's possible and how one might build an at least more trustable or working relationship between the tech industry and government.

But I think there's no question that the Snowden episode really fractured that in a deep and dysfunctional way. So it might be a topic. Again, I'm not sure if it's in the purview or if it's the most effective. But within that trust bucket, the issue you raised is probably important to progress on many of them.

MS. BAIRD: We're going to need to move on -- thanks -- because we have planned to use the rest of our time before public comment period to dig into three possible areas that we may want to have on our agenda, shape our agenda around.

I think we'll revisit all of this obviously after today as we think about how do we form up the work that we take forward. But we've asked some of our members to lead off the discussion. And the three that we've highlighted because of the conversations that we've had with

people before the meeting are, first, this question of measurement.

What do we need to measure to understand what's happening in the economy, to inform policymaking? What kind of data and information does the government have that can be useful to businesses as they grow, to small businesses, to individuals to understand the economy, to policymakers? And what other information ought the government to be looking at, whether it be in the context of the Census or standard setting processes or otherwise. So the whole issue of what the measurement metrics for the economy, we're going to take up in the first session.

We're going to take up the question of the labor force and skills and how do we develop the talent for the work of the future and how do people think about their place in the work of the future.

And we're going to take up, third, the question of how do we enable -- how do we avoid a digital divide between small and large businesses

and enable small- and medium-sized businesses, which often are just individuals, to grow and participate in the benefits of data for business growth and benefit in engagement and global trade and the global economy.

So to kick us off on the measurement point, let me ask Austan to start. And we only have, unfortunately, because of where we are in the schedule, we only have about 10 minutes for each of these topics. So Austan, I'll turn it over to you to begin the discussion. Thank you.

DR. GOOLSBEE: Okay. It works out well. I was only going to talk, you know, for three to five minutes so we could have some discussion. It's either a curse or an opportunity to have gone after -- James has already, you know, presented some fairly detailed information.

So I was just going to make a few points. The first is, if you didn't know already, the Commerce Department is in the pantheon of the greatest data agencies of the world and the BEA and the National Accounts run out of Commerce.

You've got the Census run out of Commerce, both the individual Census and all of the economic censuses, ESA. There's a whole -- there are a whole bunch of functions. So I think it's totally appropriate that we would think about that topic of how could we give some contributions, some advice, as it were, to these data agencies.

I think the existing structure we have now, in a weird way, in the data world, we have the same thinking as in the labor world or as in others. Our systems are designed really with the 20th century economy in mind in what we track and what we measure. And that's becoming increasingly wrong. And in a way that makes it hard for both industry and for policy to do what they need to do.

So at a fundamental level, we basically try to measure the standard of living through the GDP and output and we kind of measure outputs and we measure inputs. And both of those are getting complicated. So I would think we might be able to give some help on identifying what are the correct

outputs, what are the correct inputs and how to measure them.

So on the output side, we've -- we have largely interpreted for all the time when we've been keeping the data, we'll estimate the value, the contribution, the standard of living by how much you spend on it. And now, we've got a bunch of things that are free that we spend a lot of time on but we don't pay any money for.

There's an active and contentious debate over -- from Hal Varian and others, if we spend a lot of time on these things and they raise our standard of living, is it best to think of those as productivity enhancing and we're just mismeasuring it or is it best to think of that as, no, that really is a productivity slowdown. You're not doing anything. You're not selling anything. And so, that's an area that we want to think about.

On the input side, we talked a little bit last night about the changing nature -- and I loved the comments as regards to AT&T, the

changing nature of what our investments -- you know, what are we going to be buying equipment anymore?

We've seen a big shift to software as a service and other capital goods that our conception of let's go out and buy a thing for a lot of money today, which we depreciate and we get these payments over a 10-year period, that's not really the model anymore. And so, I think some measuring what the new assets are -- if you just look at market value to book value of assets, it's gone way, way up.

So you know, in Bill's phrasing from last night, it used to be the most valuable companies were those that had the most assets. And now, it's increasingly not. The most valuable companies, they have very few physical assets and measures. So how do we measure the existence of, size of intellectual property, human capital, things like that I think is another great area. It's going to spill over into our discussion of the labor force.

The other major input, you've got capital input, you've got the labor input. Increasingly, the labor input is not just bodies but a bunch of skills. And how we work with the -- how we get the Commerce Department to work with Bureau of Labor Statistics and work with the private data providers on an inventory or a census or something, if you will, of skills and the economy and what are being used and what are important I think could be good.

And we've increasingly seen that the more measured it is, the better off -- the better we are able to deal policies towards it, industries towards it. I wonder if we could talk about the measurement of drones, automated cars, the Internet of things. We really have no conception of how big these truly are, except through private surveys that, you know, we try to be representative. But I wonder if the department could go through that.

Monitoring the international treatment of digital goods coming from the United States and

the flows -- you know, tracking the flows is the beginning of that. But the tracking the equivalent of tariffs and regulatory restrictions, tracking security violations, tracking things that have to do with cybersecurity. I think the senator's right. All of those are going to be major issues.

So I just highlight those issues as being of critical importance to several of the other things we're going to be doing, to several of the things that the Commerce Department does and I would just end with one plea. For six years, I was on the Census Advisory Commission. And with the origin of electronic commerce, there were a lot of pressures on the Census Bureau to start keeping track. See, you've got a census of retail trade. You've got to start keeping track of electronic commerce. And Census felt, and not wrongly, that so much pressure was on them to track electronic commerce from Congress and others, but nobody gave them any money.

So they -- to inherently tell them we

need you to track A, B and C was forcing them to say we're going to stop. We're going to have to stop or cancel program D, E and F, which actually were important for tracking the economy. I would hope that we don't do that. We can have a lot of suggestions. But let's not -- let's not tell them abandon all the stuff that you have been tracking because this is so important, we only want you to pay attention to it.

MS. BAIRD: (Off mic, inaudible) -- sorry. This is going to become a digital economy agency.

MR. MANYIKA: If I could, sorry, two quick comments. Austan, I thought that was terrific. I mean, you covered pretty much many of the questions on my mind. I think two quick comments. One is I think on your question about tracking assets and which ones should we track, one suggestion would be to also consider data as an asset.

And in fact, one of the things -- because if you were to include things that look

like software and data as assets, that probably more closely correlates to, you know, the evaluations you often see of entities and companies. It's much closer to that. Even in the assessment that we tried to do of the economy, we did try to include data in the asset group of things we measures. So that's one suggestion.

And then the other comment is, I think, one thing that we'll have to think through on all these measurement questions is that one of the things that's changed is that much of the information about het digital economy is actually not in the hands of the government. It's actually in private places and private sources.

I mean, we've found that even in our work when we try to understand global data flows, most of the sources for that are actually in the private sector. You know, whether that's companies or a whole set of -- so the question is how do we work through where the sources of data for a lot of these things are no longer going to be surveys. And we know the flaws with surveys.

But there's actually now a lot of behavioral data that actually exists. How do we work that question, access to the data?

MS. BAIRD: Yeah, that's huge. I'm going to have to move us on to the next topic. So if I could call on Mindy to jump in on the skills and labor issue?

MS. GROSSMAN: Sure. We've talked a lot about this throughout the morning. And if you take James' comment that most jobs will change and then Brad's about who are going to fill them, I think it's imperative that, given the shift to the digital economy, that we really focus on training, educating and certainly developing a workforce that has the skills to serve the needs of business in the future.

So I think no matter where we think our businesses are headed, the pace of innovation certainly is not going to slow down nor is our expectations or imagination. And if you look at the facts today, there really are no lack of jobs. There's a lack of unfilled positions in the

workforce. I was talking to Penny last night. I think that number is about 5.8 million. And that actually bests the record set before the recession.

So I think new technology cycles are going to bring new requirements and the cycles are actually getting shorter, which relates to a skills mismatch. So I think the magnitude of training and re-skilling is critical. I think the mismatch also is driving up the price of labor and the competition for workers in this world. And what contributes to that are things like education policy, immigration policy and also the inability to keep up with new economy industries.

So Bill was talking about that, you know, from GE earlier. And how -- are we creating greater inequities if we don't address the workforce training currently and future and are we also jeopardizing our own competitiveness if we're not supporting the business needs?

So you know, I think there's some seismic shifts in where our investments and talent

will be focused. So for example, working with, you know, my role at the National Retail Federation, which covers businesses from small, independent retailers to large mass to digital, we represent one in four jobs in the U.S.

So if you think of the type of jobs that are going to be required and the skills needed are shifting dramatically, so need for data scientists, analytics, engineers, programmers, videographers, content creators, IT professionals, security experts, social and even digital sales professionals and people who can actually use new technologies even in a selling environment. So this utilization of tools, it's actually permeating the length and breadth of every function.

I do think though, to James' earlier point, the one thing we also can't forget is that technology can't replace creativity. So how do we merge the skills that are needed in a digital world, but still foster the creativity needed to utilize those skills and move them forward?

We recently polled a very broad group of CEOs and asked them what keeps them up at night. And certainly, the typical things like security and other things came up. But I will say that the number one thing on that list was talent and making sure we're attracting, retaining and developing the talent that we need for the future of the business and having a robust pipeline of talent within the industry to make it competitive in growth.

So certainly working with educators on curricula or academia and business and academic partnerships are important, what are broad-based training programs, whether it be for our industry and others, as well as certifications to reflect new talent needs. How do we certainly work industry- wide, but how do we bridge that, because it's not an industry-specific issue? It's relevant to our ability to be competitive.

So I think the big questions that come up is, you know, how do we enable the people to get the skills they need to participate? And I

think the word participation has come up quite a bit this morning. And then, where are the biggest gaps in that. And what training and educational institutions and curricula -- and I said before, even early on, in early education, but certainly critical now to get these jobs filled.

And if we don't, what impact is that going to have on American competitiveness? And you know, then what can we do, certainly government and business, to be able to prepare the workforce?

MS. BAIRD: (Off mic, inaudible)

MR. CICCONI: I could just underscore what Mindy said there. I mean, we're -- at AT&T, I mean, we're dealing with a lot of this right now. The biggest challenge I think we have going forward is reskilling of the workforce. We're actually doing a lot of it ourselves because there just aren't really good ways of doing it out there, with the exception of some experimentation with Georgia Tech that we've done between them and Udactity. Much of this we're doing ourselves.

And I think one of the things that we ought to be looking at is how our educational system in this country is really not meeting this challenge currently. And it's not, as far as we can tell. The cost of higher education is dramatically rising. Access to higher education is being limited by that. People come out with incredible loads of debt, which, you know, burdens them further.

But we have all these midcareer people who we are talking about who are in midlevel jobs that they're not necessarily going to go away, but they're going to change. But we have to give these people the capability of doing it. And we're finding in our company, when we make it available, the uptake rate is huge, is huge. These are people in their thirties or maybe early forties and they see their jobs changing in the course of their career and they want to develop the skills to be able to meet those challenges and adapt so they have a good career.

But it's one thing when you have a

company your size that, you know, maybe has the capability of developing that internally. But not everybody can do that. And a lot of that really should be falling to the higher educational sstem in this country and it's just not designed for this at all.

MS. BAIRD: (Off mic, inaudible) -- I apologize. The notion of employers training their employees has a very long tradition in this country. But it is something that we've gotten away from, as people haven't had lifetime employment with the same Fortune 500 companies as they used to.

And there's an interesting experimentation going on in the Labor Department and Commerce I think have been engaged in, in looking at the models of some other countries and thinking about how to do apprenticeship programs or internships or other kinds of programs like that, get encouraged. Also, there's a lot of research. We've done some of it. But there's a lot of research showing that employers are looking

for skills that cut across the board in who they're trying to hire.

So soft skills, creativity skills, skills of capacity to work in teams. And so, one of the things we may want to look at is how can the Commerce Department really contribute to collections of employers collaborating on skills development and creating new innovations in that regard, as well as encouraging employers like your own.

MR. CICCONI: Yeah. One thing I'd put on that list is alternative certifications. I mean, we actually -- if you get a -- you know, a computer science certification from AT&T, you know, that's probably portable. And as you think more about the contingent workforce that we were talking about earlier, you might be able to develop that across the board. But make no mistake, that is something that we have to consider simply because our traditional sources of higher education aren't meeting that need themselves.

MS. BAIRD: Please.

SEC. PRITZKER: So we've been -- at the Department of Commerce, as you rightly point out, we used to be the department of commerce and labor before the Department of Commerce. But we did make workforce training a priority because -- from every single employer that I met with, since day one, that this is an issue. So the way that we've tried to influence is two or three ways. And one is to work with the Department of Labor so that there's now a federal checklist.

We work not just with Labor but with the administration. There's a federal checklist so that in order for federal grants, there's about $1.4 billion of funding that requires certain criteria, including a business-driven, job-driven criteria so that the federal money is pushing out principles as opposed to pushing out solutions.

Second is the president's committed to double the number of apprenticeships. That's a focus. But third is the Department of Commerce, we have a partnership with the Aspen Institute

called Communities that Work. And we're working with seven differ net communities that are focused, you know, on different sectors of their economy. And the concept is to bring together the business leadership, the educational leadership.

So that's K-12 plus community college plus university, in a community, local government in some instances -- and those that are working best, the social service organizations because often you have to help somebody bridge from one place to another. And what we're finding is -- and that -- we'll have results of that effort towards the end of the year, the goal being not only learning from each other, but to come up with best practices.

And what we're finding is that communities where the local leadership takes hold of this and recognizes here are the six or eight or five or seven sectors of the economy we're really going to focus on. And they come together and they break down. And what the federal effort is doing is helping them break down their own

siloes and really address this.

There's enormous positive -- enormously positive things that are happening for the workforce and for the employer, getting the workforce to meet the needs of the employer, getting the whole apparatus to begin to work towards the jobs and the way jobs are training, trying to get the ed system to start much younger to address this, the challenges that communities are going through. These communities range from Dalton, Georgia, you know, to San Francisco. So there's a different variety.

But the point being three's a bunch of work we're doing. You should get briefed on that so you know kind of what we're doing and how to build on that as well because I think what we're trying to do is, with limited resources, come up with best practices and then how can we use our, let's say, economic development grant dollars to make sure they're being used to support workforce training, even though the mandate is really public works out of EDA.

So just a few thoughts about what you're doing. You should make sure you guys are aware of that so we can build on that.

DR. TELLADO: Thank you, Mindy. That was terrific. And I just wanted to applaud the -- in the framework, how closely you tied our conversation around skills with access and I don't want us to lose that. I think both need to be braided together and to the extent that in this third bucket that you pulled out, Zothat we don't -- we don't forget that. I think that the two working in partnership is essentially.

MS. BARTLESON: There's a piece of skills that's very important in industry right now and that's diversity and inclusion. It's a really big thrust. And if there's a way that we can, through Department of Commerce and through this board, if we can make that a reality rather than just lip service, I think we'll make a huge difference. And the digital economy is giving underrepresented groups a huge opportunity that they never had before.

MS. BAIRD: (Off mic, inaudible) -- I'm sorry. I'm not very attentive to that. I'm going to move us on now, if I may --

SEC. PRITZKER: Unfortunately, I'm going to have to leave in a couple of minutes. So I don't want to interrupt the next discussion. So I will sneak out. I'm going to try and circle back before you all wrap up during your lunch period or after that. But I just want to say thank you. This is unbelievably -- I can tell this is going to be an incredibly productive and useful and I really appreciate the commitment all of you are making.

MS. BAIRD: We're very grateful to you for inviting us here. And as you leave, listen carefully, because Bill is going to take on a topic that I know you care about a lot.

SEC. PRITZKER: Yeah. So I'm going to be quiet.

MS. BAIRD: So I'm going to pass it over to Bill.

MR. RUH: Thank you very much. Look, I

think we all know the digital economy is here today. It's just not evenly distributed inside the U.S. or even globally. The thing that seems to be at the cornerstone of this distribution are these technology platforms that become the cornerstone of the ability to scale and deliver and enable people, small businesses, individuals as well as large businesses to participate domestically and globally.

But -- and a good example, the Internet itself is a basic platform. But it is not the digital economy platform. It's the connectivity/communication platform. So we certainly need greater access even to start there. Without that, you can't participate in the digital economy. But above and beyond that, we've got to encourage platforms.

The examples in the world today that are successful, the consumer app economy, is built on a number of different platforms from a number of different players. And that has allowed a lot of small, innovative companies to build and deliver

products on a global basis like never before. And you know, certainly we see things like Bitcoin emerging as new kinds of platforms.

So the point that I would make here is there's not going to be a platform. There will be lots of platforms. We have to encourage them. And this has to be encouraged across all industries. But they can also be barriers. We've seen discussion about single digital markets globally. I think we have to be cognizant that if these become platforms, that they could in fact be inhibitors to having a true digital global economy. And we have to make sure we think about that in policy.

I think that if we look there -- what we're trying to accomplish is fairness, competitiveness, the ability to be global and allow people to innovate simultaneously. I think these things have to be built into policy. And if I look at the agenda and activities, I think this is awesome. I think it covers quite a bit.

I would just make, with regard to

platforms, three points to consider. One is I think data is like -- data rights and data protection are like water rights of the valley. If you don't have data and you don't have access to the data, you can't compete effectively. And I would -- I really applaud the cross-border data initiative.

But I think it almost has to be a first tier player, not embedded in free and open Internet. It's so important that we think about data both in terms of what the government needs to do with its data, but how we enable data within the U.S. and outside. And it can't be buried in sort of just a single activity.

I think the second thing is we've got to lead on global trade and ensure that platforms are open for scaling outside. We already are starting to see barriers put in place and countries making decisions about not allowing platforms to play. And I think that will not enable our small and medium businesses as well as our large businesses to compete effectively.

The last thing has got to be ensuring there are standards so these things are not built in a way that becomes a barrier. And there has to be an open way for everybody to participate in these kind of things going forward so we can all compete. Things in the industrial world, like the industrial Internet Consortium have been put together to try to lead in this. But I think we've got to enable these more and more.

So I would just say that I think platforms are not something you dictate or legislate. The market decides on winning platforms. We have to though enable fairness, standardization, competitiveness, the ability to compete globally and allow them to be innovative and not stop people from innovating.

MS. BAIRD: (Off mic, inaudible)

MR. DAVIDSON: I might just throw at you - - because I know our time will get short -- like a meta-comment about all three groups, which is just to say I think these are three terrific topics where this group could add a huge amount of

value, which is partly why we're really glad that they came up organically from your conversations, particularly with the co-chairs.

In each of them, there's -- as you heard from the secretary -- a fair amount of work that we're doing. We're doing a lot on this measurement project. But there's a lot more help we could use in thinking about it. We're doing a fair amount -- this is coming out of the economic statistics -- BSA or ---- bureau on this. The issue of skills and education that you heard the sectary talk about all the work that we're doing there.

But I think also there's a -- there are additional thoughts about where we could direct our efforts and what role Commerce particularly could play. That'd be helpful. And on this one, this is a huge -- we have a Commerce Data Service that we've stood up, data itself, but also this issue of how we interact with SMEs is a big topic for our International Trade Administration. We have an e- commerce initiative there. We've got

our attachout in the field.

So pulling these things together in the way that you've talked about could be really helpful. And the only thing I would add is I also don't -- I wouldn't want -- I think there's a little probably bit of conversation to be had about, you know, are there things that we're missing in these sets of buckets. This is plenty of work to do.

I guess if I had to pull out one other thing, I would say I heard about the trust agenda today, whether it's, you know, Marta's comment about the IoT or the cybersecurity conversation we've had. It's come up a lot and whether there was something productive for us to do there.

And I sort of leave it to the chairs also to think about whether we could have three small subgroups, four subgroups, whether we want to pick and choose, whether we want to do all these things. But that would be my sort -- I would just say this is really productive stuff that we could really -- I think could add value here very,

very easily in the next six months.

MS. BAIRD: (Off mic, inaudible) -- thank you. I'll just leave it on. Then I won't speak in between. If I may, let me go back to what Bill opened up particularly because I think there are others here with views about this. The capacity to enable the participation of small- and medium-sized enterprises -- I mean, if you look at any of the data, we know that only 4 percent of small businesses export.

But we know that of those who use platforms, as Bill talked about, the number skyrockets. It's something like 70 percent. I don't know what the number is. But it's a totally different order of magnitude.

And we know -- and James is one of the leaders in trying to quantify this -- the billions of additional middle class consumers who are going to be coming online in very short order in countries around the world.

So these are -- this is a fairly central issue to the possibility of growing more good jobs

in this country if our small- and medium-sized enterprises can really engage through the kinds of platforms that Bill's talking about, with good data analytics for their own understanding of markets and supply chain management and all the things that GE does so well.

Well, why can't a local business do it with shared data or good analytics, as well as the export issue? Are there others who want to jump in on this topic for a minute here? Please?

MR. BECKER: So just to follow-up on what Bill said since Silicon Valley Bank represents about 50 percent of all venture-backed companies in the U.S. So going global at an early stage is so critical to their success and so I agree with you.

I think making sure that the cross-border data initiative is one of the key topics, is critical to them because if they -- if they don't have that free access from a global perspective and global availability, it's just -- kills a lot of their opportunities. So I would

just concur with that.

MS. BAIRD: Any other comments or thoughts? Well, we have blown right through our break, as you have probably noticed. So I apologize for that. But we're going to move to a public comment period. Mitchell, you want to take over?

MS. BAKER: Well, so the floor is open for public comments and I will ask our organizers here - - these are public comments here in this room or are there other facilities as well?

MS. REMALEY: Yeah. So we have an open phone line actually. So the public can join that way. And we also have the ability for those in the audience to speak as well.

MS. BAKER: Great.

MS. REMALEY: We have some microphones that we'll pass --

MS. BAKER: And that phone line, is that available? Do we need to give out the phone number or is it available some other way?

MS. REMALEY: Yes. It was actually on

the agenda online.

MS. BAKER: Great.

MS. REMALEY: So it's -- or we could also read it out. But it is -- it's on the NTIA website, the DEBA website. I'm happy to give the number as well. For the local number, it's 203-607-0666 and the PIN number is 5609518.

MR. DAVIDSON: We are not accepting donations.

MS. REMALEY: No, we're not.

MS. BAKER: No sales, no donations on this set of calls. All right, and so you'll let us know if there's a phone call that we want to address. Great. In that case, I'll ask if there's any questions from our audience here. Questions, interventions?

DR. GOOLSBEE: One comment that I would just say, given the nature of what our work is, it might be worth opening the public comments to something that's not a -- not required to happen during our meeting.

MS. BAKER: Right. Yeah.

DR. GOOLSBEE: People could send in a question and they could farm it out to the board or something.

MS. REMALEY: Absolutely. And we actually did give a call for that in our Federal Register notice. So that is open and we do welcome after today's first meeting -- we'll be accepting written comments as well.

MS. BAKER: Great. And so, once again, I'll just ask if there's anyone here -- well, we may gain some time back in that case. And so, Zo I'm going to hand it back to you.

MS. BAIRD: Okay. Thank you. See how seamlessly we work together? We've known each other for a few years. So it helps. We're thinking and the Commerce Department has asked us to think hard about how we can make some progress in the next six months. We have a two-year timeframe for the appointments to the board and the standup of the board. But their hope is that we will have some contribution to make in short order.

Our thought is that we'll have three public meetings within that timeframe. We're looking at the first week of August for our second meeting, probably in California. And the third meeting will probably be in November and we'll talk more about all of this, excuse me, and obviously get your input.

As we said earlier, we are looking to form up working groups. We're looking to create robust public engagement. One way to get more robust public engagement will be to have some people participate and provide input to the working groups beyond those who will draw on to participate in the plenary public meetings.

And I just want to open up the floor now, on behalf of Mitchell and myself, to get your suggestions for how we move forward and the form in which we meet and deliberate or any other thoughts that you have about how you'd like to see us work.

MR. RUH: Well, we are on the digital economy. I assume we would have digital tools

that would allow us to not have to always meet and collaborate in person. So I don't know how we go about doing that, but we should almost start with that as a center point of this.

MS. REMALEY: I can speak to that a bit. So we do have capabilities at the department that we can offer. For instance, a collaboration site for the members, things like that that should make it a bit more helpful to collaborate. And obviously, phone bridges and things like that. We we'll have those administrative options available if the group would like to meet inter-sessionally (sic). If we do get together as a full group, that we need to do in the public.

But when it's subgroups working on just getting together to prepare, to talk about what might go into deliverables that would be presented to the full group, that's okay to do inter-sessionally with just the small groups.

DR. GOOLSBEE: Could you or Zomaybe, could we talk a little bit about procedurally what we think our production is meant to be? Are we

going to be issuing a report? Is it a -- I know different committees advising the federal government have different things that they do.

Some put out large data reports. Some write a letter to the secretary saying we think one, two, three. Some just give a briefing. Do we have a sense of what we -- that might help us figure out what we're --

MS. GROSSMAN: I would echo on that because you mentioned that you want to see specific progress in the next six months. What does that look like to you?

MS. BAIRD: Yeah. I think -- I think we have a lot of work to do to sort that out and it's going to turn in part on what the working groups think will be most productive. But you know, we welcome your thoughts on that.

Our inclination is to not try to prepare a comprehensive state of the world-type report that recounts the kinds of things that McKinsey's already done, but rather, as Alan was saying, to be very targeted on where we feel we can make a

contribution and that the working groups will need to look at to what extent are they setting up the objectives or the suggestions for principles or the possibilities in this timeframe and to what extent do we have answers.

For example, if there's a group that works on measurement, that group might say these are things that we need to examine to see how they'd best be measured, as opposed to recommending what data should be collected and hat the measurement should be.

So I think it's going to vary. Some things we'll be able to make fairly quick progress, presumably, based on work that's been done by others or ourselves in the past to target some recommendations. But on others, I think we're going to be just targeting what needs to be focused on. So my own inclination is to let the working groups try to put things into two buckets like that and see how far you think you can get quickly.

And then, we should consider that

together in terms of our objectives, with a lot of interim conversation through digital tools I think.

MR. DAVIDSON: And I would just echo that and say I think it's between -- as we've been thinking about how to set this up, and others can chime in -- I think the charge was originally to provide input and advice to the secretary ultimately on the, you know, important trends and policy priorities in the digital economy, from this illustrious group of experts.

And we really value that. That said, that doesn't have to come, as I said, in the -- it could come -- I mean, I don't think it's an either/or in our minds. And all along, we've felt that, yes, a paper that we could look at would be valuable, seeing things like the masterful job that James did with that set of slides, compressing three large McKinsey talks into 15 minutes was very impressive and very helpful for us.

Having that on the record in some ways

can be really helpful for us because it gives us a chance to really ground our work in a set of inputs and advice formally from people who are real leaders in the field. So we're not just making this stuff up ourselves. So that is really valuable. But like I -- you know, there's not an either/or here. Papers are welcome. But short, quick interventions are also welcome and there's no timeline that says all of this has to be delivered in the fall.

I think we had contemplated all along that some of this could be things -- you know, could be work that happens in the fall. Some of it could be work that happens faster because there are probably a few of these areas where there -- it's clear you all have some very well-formed thoughts. Some of them might even be a slower burn. And I think we all recognize that.

And so, I'd just say I don't think we come in with any hard, fast notions about how this is supposed to happen. I think there is a set of tools in the toolkit and it will vary for each of

the groups and each of the topics that the group ends up taking up.

MR. ANDREWS: Yeah, I guess the one thing I would just add to that, which I think that is totally right. I would say though that also just as part of this focusing on what are very actionable recommendations, particularly in a short, six-month timeframe and obviously of the three topics laid out, all are -- none of them are easy or frankly we would have solved them all by now. They're all challenges and they're going to be both short-term challenges and long-term challenges.

But I do think Alan's point is right. But I think very actionable recommendations is helpful as well. And you know, I would use the example of the president's export council, for example, which has done, you know -- each year does a letter to the president making recommendations. That is one form that I do think, particularly in a six-month timeframe, would be very helpful.

But I think, to Alan's point, this is -- part of having the working groups sit down and really scope out the problems, but then also what's the best form to offer recommendations and input on will come out of each one uniquely. But I would just put towards a bias of recommendations as well.

DR. GOOLSBEE: They don't tend to meet as frequently as what you're describing. I mean, meeting three times in six months, face-to-face is a pretty aggressive --

MR. ANDREWS: Yes.

DR. GOOLSBEE: -- meeting schedule. So if we were going to maintain that, I feel like it would help us on the committee to have some direction. Let's not organize meetings just for the sake of organizing meetings and then at each meeting, we try to decide, well, what are we trying to do.

MS. BAIRD: Yeah. We'll have some time to get into this a little more too when we have, you know, a working meeting after lunch today --

DR. GOOLSBEE: Arrangement, yeah.

MS. BAIRD: -- to organize ourselves. I think Mitchell wanted --

MS. BAKER: I had just one quick question related to this. When the group meets as a whole and the public requirement is in play, does that mean physically face-to-face with public access or can we use digital tools for public access?

MS. REMALEY: So yes, we can use digital tools for public access and -- but when we do meet in person, I think we will usually try to always have the opportunity for the public to join if it's the full group. But certainly with the phone bridge, we do always try to allow the remote access.

MR. THOMAS: One note on next steps, I think Alan brought the issue of the trust and how essential that is -- I think one of the unknown areas, at least for me, is what are the distinctions or overlap with the president's commission on cybersecurity and how should we

think about, you know, trust as it relates to the digital economy and what we can -- or what's already been done, because I don't think we have the need or desire to replicate work that's being done. But I would hate for sort of like work to be ignored because everyone else assumes someone's doing it.

DR. TELLADO: Great.

MR. BECKER: Just to follow up on that, I think that's true with almost everything on that list, on the agenda and activities. I mean, it seems like there are so many other committees and organizations, the Department of Labor working on skills development and then, you know, next generation of workforce, the Department of Education also on skills development.

So to me, looking at that list, what are the other groups or the organizations, what are they working on and how can we leverage that. I always find it easier to respond to what other people are doing as opposed to spending six months, nine months free thinking ideas and then

finding out that other groups are already working on it and then feeling like you wasted a lot of time.

So whatever we can do and get from a help perspective to understand what everyone else is working on would be helpful, which is kind of what you were saying, Corey.

DR. TELLADO: Great. Very helpful, Greg. I was -- your comment made me think of -- as well as yours, Alan, when you, I think, put sort of a proposal to think about do we need another bucket. And it isn't really -- I'm not suggesting that. But is there something on that list that isn't being pursued.

And then, as I thought about that, I thought about your comment on the Internet of things, which does bring trust to the table. But it could be a valuable way to do something that isn't being replicated elsewhere that would bring in the trust element.

MS. BAIRD: Okay. So we're going to break at this point. And I think we have covered

our agenda. So I thank everyone for your patience. I apologize we didn't take a break in the middle. But we wanted to keep everyone together as long as we could while the secretary was here. So now you get your break. And we'll continue the conversation. Thank everyone at Commerce for what you've done to support us.

MS. REMALEY: Zosorry, one thing I did want to mention is that if we -- as we move into the session this afternoon that is more an administrative and preparatory session, we do have to have a sense here in the public session about what topics we want to take into that discussion of where we -- how we will focus our time and organize.

So it sounded to me like we had agreed to at least pursue the three areas and maybe a fourth. And do -- maybe we could just see if we have consensus on that so we can feel that we are able to go in and have that planning discussion as well?

MS. BAIRD: It looks like you do.

MS. REMALEY: Okay. Wonderful. Thank you for obliging me on that. Thank you.

MR. DAVIDSON: SO are we adjourning for the -- we're closing the session?

MS. BAIRD: We're closing the public session.

MR. DAVIDSON: Okay.

MS. REMALEY: Okay. Wonderful.

MR. DAVIDSON: -- in the audience as well and the people who are tuning in and tweeting as well. So we appreciate it and your input is incredibly important to us and this ambitious agenda we have. So thank you all.

MS. REMALEY: Thank you so much.

MS. BAIRD: That's it.

MS. REMALEY: And with that, I will adjourn the meeting. Thank you.

(Whereupon, the foregoing adjourned at 11:35 a.m.)

CERTIFICATE OF NOTARY PUBLIC

I, Erick McNair, the officer before whom the foregoing proceeding was taken, do hereby certify that the proceedings were recorded by me and thereafter reduced to typewriting under my direction; that said proceedings are a true and accurate record to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

Erick McNair
Notary Public in and for the
District of Columbia

CERTIFICATE OF TRANSCRIPTION

I, BENJAMIN GRAHAM, hereby certify that I am not the Court Reporter who reported the following proceeding and that I have typed the transcript of this proceeding using the Court Reporter's notes and recordings. The foregoing/attached transcript is a true, correct, and complete transcription of said proceeding.

May 25, 2016 BENJAMIN GRAHAM

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