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Innovate for America [Entire Talk]

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As America's first Chief Technology Officer, Aneesh Chopra focuses on advancing technology and innovation to unlock national economic growth and prosperity. In this inspiring and entertaining lecture, Chopra challenges students and entrepreneurs to take action now to bring innovation to the healthcare, education and government sectors. He also discusses leveraging government's vast open data resources, championing new ideas on immigration policy as it relates to innovation, and supporting American entrepreneurship programs.



Transcript

It is my sincere pleasure to introduce our guest today. It is Aneesh Chopra and he is the first Chief Technology Officer of the United States of America. Pretty cool title, and he reports directly to the President of the United States. We had the chance to spend a little bit of time with him before and his job is truly fascinating. I'm going to let him tell you all about the details and all of the fabulous plans that he has in place for all of us. All right. Aneesh. Thank you very much. Yes. So my job this afternoon is to convince all of you that there's never been a better time to be an innovator.

And if I'm really successful, I'm going to convince you to be an innovator in some of the key areas that have plagued our country for months and years. Areas like our health care system, our energy system, and our educational system. To get us started, I'm going to provide for you a little bit of a road map for the discussion. And then I, of course look forward to the conversation, through Q&A we'll have after my remarks. My intention is to begin with a conversation about the strategy for American innovation that the President unveiled in September of 2009. It's the document that guides the bulk of my work. Second, I want to provide for you a framework for three concrete challenges where we need you as entrepreneurs to help us. And last but not the least; I want to provide for you a series of case studies that demonstrate this commitment to innovation that has been a key pillar of the President's strategy to change the way Washington works. So with that, I want to start with my first homework assignment. On the President's first full day in office, before he even unpacked the bags so to speak, he issued a memorandum on open government.

And he announced that his Chief Technology Officer would provide recommendations on how we would make our government more transparent, more participatory, and more collaborative. Now I had not yet been named, but the homework assignment was daunting. It was to translate the philosophy that had governed his life, the notion of bottom-up change, into a bureaucracy that may not have been as accepting, if you will, of such change. I saw this first hand. I wanted to show my first story with you on a very personal anecdote. I, of course, you could tell from my name Aneesh Chopra, my parents come from India. I was born in Trenton, New Jersey. And I had the pleasure of travelling to India with our President in November of 2010 and in fact, inaugurated the President's India-U.S. open government strategic dialogue. The basis for that dialogue was born in this graphic that you can barely see depending on where you are.

It's a picture of the President having a conversation with one of the most rural villages in the state called, Rajasthan. The back-story is as follows: the government of India has made connectivity to rural communities a priority. And the Chief Technology Officer equivalent, a gentleman by name of Sam Pitroda, had been putting in place a strategy to bring fiber

connectivity and 4G WiMAX towers to each of the rural villages throughout and they had about 250,000 of them, they're called panchayats. And the first one of these had been lit up in time for the President's visit. We were in Mumbai, which is a major metropolitan area. And before the President addressed the students at St. Xavier's College, he had the chance to walk through an expose of all of these innovative uses of open technology in the advancement of democracy in India. Culminating in this conversation that he had with individuals that lacked access to indoor plumbing, or what you and I would consider to be traditional infrastructure. Yet they had 4G and it had transformed their lives. A nurse told the President, how now she has access to information to know exactly which kids in the village, to make sure that they were on track with their health care.

A student, not unlike many of you in this room, had the chance to communicate and take actually an MBA program, Tina, an MBA program from this village without having to travel and leave his family. And it was in this context where the President spoke about a very interesting phenomenon that openness and technology have now enabled around the world; the concept of leapfrog. The President saw all of these and is thinking himself, what will this infrastructure do; to think about the health care, the energy system, and the education system for that village. And he remarked about the power in some of these emerging markets where you'll see that leapfrogging off of what we have today in our 20th century infrastructure. It's a lot of what governs our thinking about changing the way Washington works. It also infuses this notion of what is our long-term economic growth strategy. As I mentioned to you at the outset of my remarks, it was in September of 2009, the President travelled to a community college in upstate New York. It was my first trip on Air Force One, which I must tell you was a very cool experience; calling your wife and the military guy calls and says, "Who you take a call from Air Force One?" I scored some points that day. Anyway, the community college was the backdrop. Students in all ages; 30, 40, 50 years old coming back to school to study how they could win in a clean energy economy and what they can do to gain jobs at health care.

And the President spoke to them and he said, "I see the role of government in three parts when thinking about this long-term economic story that is America. First, that America is at its best when we invest in the building blocks of innovation." Now the building blocks of innovation, historically, have been infrastructure: roadways, railways, runways. But now, it's increasingly digital infrastructure: wireless technology, 4G -- the comment that I made about what we saw in India, critical infrastructure for a thriving economy. We also speak about human capital, making sure that we graduate more students that have college degrees, ensuring that we have a higher share of those students focusing on science, technology, engineering and mathematics. And it's also about a research and development pipeline to make sure that the industries of the future are thought about in our universities today and all of you have the chance to engage. The second pillar of the President's strategy is to ensure that we have the right market conditions to promote innovation and entrepreneurship. That is setting the rules of the road: ensuring we have a patent system that works, getting some of the new rules on the Internet right around cyber security and privacy, thinking about how we cultivate more communities of entrepreneurs through a program I'll talk about called, "Startup America". But last and certainly not the least, the part that occupies a great deal of my time, is that the President identified a few areas where we need to catalyze breakthroughs. And it's through an all hands-on deck philosophy that we believe we can achieve these breakthroughs. Yes, we need entrepreneurs to invent a better health care system and a better education system in the like, but we also need a public sector that is a nice receptacle or partner that will effectively work with these entrepreneurs so that we can see those new ideas reach the market eventually scale.

And so in this domain, I focus a lot of time on health, energy and education, and you'll hear more about that as I go through my remarks. But let me begin with that first piece of infrastructure, that notion of wireless connectivity. I'm going to share with you a graphic that was presented by McKinsey maybe two or three months ago, and it looked at the American economy and it identified the fact that productivity growth highly correlates with GDP growth. That is sectors of the U.S. economy that can deliver productivity gains will actually help us achieve that overall economic growth position. What this graph shows you though, is that few sectors of the U.S. economy have accounted for a disproportionate of share of our productivity growth. And it's the sectors that you know; computers in the like, that have achieved Moore's law consistently, and other sectors that have incorporated the kind of pressures that is the story of productivity. But I circled three on this graphic that have been either flat to negative on productivity growth; government as a sector, health care as a sector, and education as a sector, together accounting for 20 percent of the nation's GDP. If we are to achieve the long-term economic growth prospects, we will have to do so by unlocking these hidden opportunities for productivity gains.

And one insight as to how one achieves productivity gains in a sector is in an MIT study that was published even earlier than that this year, looking at how firms in an industry outperform each other and it incorporates the notion that data-driven organizations, data-driven decision-making allows those firms to be much productive. In fact, they found that companies that are instrumented actually can achieve five to six percent productivity gains. So one of the themes in this question about wireless infrastructure, is also a theme around liberating information so we can instrument sectors of the economy, more on that in a moment. The second pillar, if you will, of the strategy for American innovation they referenced was the notion of competitive markets for entrepreneurship. And here I'd like to highlight on an issue of the President rolled out in January called, "Startup America", and more specifically a symbiotic relationship between the public sector and the private sector. The Startup America program begins with a nonprofit organization called the, "Startup America Partnership" led by the chairman of the board Steve Case and a recent recruit to serve as the inaugural CEO Scott Case, no relation, who had served as one of the

founders of Price Line out here in the valley. And the Startup America Partnership has emphasized new programming to fill the void when it comes to helping entrepreneurs in the various stages that they're in. Whether be in identifying a new idea, getting that idea into a formal business, early growth in that enterprise, and then what they call the "speed up phase" where those organizations tend to hit their cycle and many of us would find that to be very exciting opportunity, but it requires a different approach. Startup America Partnership has been cultivating privately financed or nonprofit organized and delivered mentorship programs, training and education initiatives, and other support systems so that entrepreneurs at various stages of life and growth have the resources they need to be more successful. In addition this external partnership, the nonprofit Startup America Partnership is encouraging larger corporations, we might call this a big co.

to new co. relationship, to open up their supply chains that invite startups in. And you can see if you visit startupamericapartnership.org, just the sheer number of companies that have pledged to expand their relationship with startups. And if you go down the roster, it's the names you know; it's IBM, it's HP, it's Microsoft, Google and all the rest. And as an example of this concept of cultivating privately financed, privately organized initiatives under the banner of Startup America. Not too long ago in the Research Triangle Park community outside of Duke in UNC Chapel Hill, BlackStone entrepreneur network, put up \$3.5 million to higher "master entrepreneurs, to coach young folks in those communities in and around the Research Triangle Park, to deliver over five years and estimated 17,000 new jobs". Again, not a nickel of tax payer dollars but inspired by the President's call to promote and celebrate entrepreneurship organized by this external nonprofit. But it's also about us doing our jobs in Washington. There are two components of the Startup America program that are relevant to the discussion. One is the inventorying the regulatory burdens that have been a hindrance to startups in all fields.

President signed an executive order earlier this year, allowing for regulatory flexibility for small businesses and we conducted a road show around the country and a website, reducingbarriersthatideasscaled.com where entrepreneurs fed us information about where they found barriers so that we might address them in the coming months. But it's also the part that I care the most about, the part that I'm responsible for in Startup America, and that is to find ways in which the policy makers at Washington might actually open up new markets. Unleash new market opportunities. I was actually here on the Stanford campus in March. That's that picture. I brought the inaugural director of ARPA-E, which is a research and development arm for breakthroughs and clean energy. You'll hear about that in a minute. And we came to visit Stanford and had a town hall meeting, to hear from entrepreneurs directly how are our policies impacting the real world; are they working, are they not, what more can we do? And these programs we formalized under the banner of DC to VC coined by Morgenthaler Ventures, I take no credit for the branding of this initiative. Morgenthaler did this in the area of health care in the fall and we've scaled it to energy and education. But this concept of inspiring entrepreneurs to come in to these key sectors of the economy that need their help because they need to demonstrate productivity growth, and that we need them to solve our bigger challenges as a nation, is a theme I'm going to be coming back and back and back to throughout this presentation.

Before I move to the three levers that we use to pull these breakthroughs out in energy, health and education, I did want to pause for a moment and talk a bit about our immigration system. How many of you in this room are students under some form of immigration status? Probably form the hands maybe 15 percent. I want to speak to you, because on a personal level this is how my father came to this country. As an engineer at Villanova, dad holds three patents and because he had the opportunity to pursue the American dream, we have the chance to be in this great country; I have the job reporting to the President of the United States. In one generation, that's the story of America. We have a broken immigration system. And the President, just a few weeks back, called on all of us to have a civil conversation, to talk about why and how we can move this conversation forward and actually fix what's broken. The President spoke at length about the broad comprehensive nature of this challenge, but he highlighted the importance of high-skilled immigration. And he introduced a set of policy initiatives that we stand for, as an administration, that we believe speak to all of you. For example, how about we stable a green card when you graduated with a PhD or a Masters in stem fields; what about a startup visa program that allows you to stay in this country if you can raise the capital and scale up a business, hiring American workers? How about we fix the legal immigration system, to clear out the backlog and to address some of the challenges about how we allow families in or our through the legal system and how do we strengthen that which works and fix what's broken in initiatives like the H1B program.

President has called for all of this to happen. It's personal for me cause I added in there the picture of me when I was 11, I visited India for the first time. That's my dad's village, no indoor plumbing, typical at the time. They were refugees when India and Pakistan bifurcated at the turn of India's independence and Pakistan's independence. And so, this is a real challenge for our country and to the 15 percent of you in the room. The President understands and has called for us to address this and has many of you in mind when we look to fix the system. Now, I'd like to spend a chunk of time providing for you what we are calling, "the investors thesis" around these three big challenges. I want to spend some time here because this is where I want to recruit you as much as I wish to lecture for you about our policies and objectives. I'm going to start with the investor's thesis around how we will transform the American health care system. As you all know, we've passed several pieces of legislation that will, in my opinion, fuel this investor's thesis.

The first piece of legislation actually happened within two months that the President took office. It was our Recovery Act

and as many of you know, the Recovery Act was emphasizing how do we get people back to work. But the President included in the Recovery Act a portion of funds that would actually serve as the foundation for economic growth in sectors of the economy that hadn't seen the kind of breakthroughs that we've been looking for. So he put a down payment on health care reform by calling for the digitization of the nation's health care system through the High-tech Act; \$28 billion of investment to be spent over the next five to seven years, to get hospitals and doctors to move from a paper-based record keeping system to a digital record keeping system. But that was not sufficient for the investor's thesis, to convince all of you to come in to what we believe to be a billion dollar industry. We followed that up with the Affordable Care Act; you might know this is health reform. Health reform meant a lot of things to a lot of people but to entrepreneurs, I would like to highlight some of the most important provisions. Chief among them, the fact that we've provided the tools to the administration, to once and for all shift the American payment system in health care for one that focuses on volume to one that focuses on value. In a capitalist society, you get what you pay for. As my friends remind me, if you incentivize volume, you're going to get a lot of visits, a lot of procedures, a lot of activity.

What you're not going to get are things that are not counted in volume like care coordination, advising folks to stay healthy, making sure that they stay out of the emergency room. In volume, that would be a negative factor. You'd actually be disincentivized. But as we move the health care system to one that focuses on outcomes, quality or value, you start to open up a market for new products and services. As we look at Affordable Care Act, we've got several bites at the apple. First, Congress has provide some explicit authorities to launch tests for new payment systems right now. Programs called medical homes, and accountable care organizations, and bundling payments and readmission reduction programs. What these programs basically do is to say to a provider, or a group of individuals that form a provider collaborative, that if you can keep someone healthier, keep their quality up and treat them better at lower cost, you get to financially benefit in that program. It will augment your traditional mechanisms for reimbursement with a bonus payment, if you will, because you were able to keep someone healthier. Now, think for a moment about today's health care system.

The provider is reacting to the patients who call to schedule a visit. And they work the schedule, and the software companies that have been very successful are those who had made scheduling better, and contrary you want to make billing better because once you schedule and you visit someone you want to get paid for the bill. So we have a great and robust market for products that schedule and bill in health care. But if you are to shift the system to focus on value, you start looking at the list of patients that are in front of the doctor and you ask the question, of the 2,000 patients that you treat, which 30 do you want to see today. Because they're most likely to need an intervention: a hospital admission or a surgical procedure or something that's a bit more on the acute side in the near future. Imagine the technologies one would need to shift the schedule around from people coming in to you, to you proactively reaching them and inviting them in the clinic so that you could treat them. You need much data mining tools, care coordination tools, patient engagement tools, tools that provide decision support so that the decisions you make when you refer them to another provider are done focused on value and quality. Those products and services have not had the business case or an investor's thesis here before because they were not reimbursable. Today, now that the law has passed, we are starting this new market come forward. Entrepreneurs, who previously might have focused on the consumer web are now wondering, "hey wait a minute, maybe I can apply those concepts in keeping people healthy.

What if I shifted my focus to join the startup, whose mission objective was to keep people out of the hospital, keep them healthier and make billions of dollars along the way." We would say, "Hallelujah". You deserve to be a billionaire. Could you imagine being a billionaire and solving the health care crisis at the same time? I'll take you for lunch at the White House mess. These innovations need a market that allows them to scale. And one of the provisions of the Affordable Care act that allows us to do this is a very interesting provision that says if we can demonstrate, through pilot tests and programs, that these new payment models have led to a better health care experience to our seniors the Medicare department and the secretary of Health and Human Services has the legal authority to scale that payment model throughout the entire reimbursement system without having to go back to Congress. That's giving investors more confidence that their products, which they believe in their heart will fuel this value driven health care system, that they have a chance to see the revenue model, the business case come to fruition. Complement this change in payment. Remind you, that I've mentioned the fact that we're digitizing the health care system. And now look at two other phenomenon. Number one the medical records that are in the doctor's office that are moving from paper-based to digital.

We're now developing in our operatively standards so that that information can be liberated so that entrepreneurs in a safe, secure, privacy-oriented way, can start to understand that information and put it to use. And it turns out, Washington has a ton of data on how we instrument the health care system that's been locked up in proverbial vaults for far too long, but as part of our open government initiative, we are liberating. Liberating at no cost to the tax payer, at no cost to intellectual property constraints so that entrepreneurs can have that information and use it to build new products and services. In fact on June 9th, I will invite all of you to a webcast at the Institute of Medicine where we'll celebrate the best and the brightest of these startups who are taking this open health data and putting it to work to build the health care delivery system in the future. All of this is available for you today, health.data.gov. And it's not just the information that's in the government's vaults. We're actually

compelling the sector to publish more quality data, and even some patients' satisfaction data. I learned, for example, we have in our database whether or not a patient slept well at night in the hospital. Tina, do you know which hospital has the best customer satisfaction in this community? I don't. Well, we have that data for you.

One of these entrepreneurs is going to go in that database and they're going to grab it and they're going to say, "Tina, we're going to provide for you a map to the most customer-friendly hospitals in the community," because it's freely available and they're going to have fun doing it. So this is the investor's thesis at health care that as we shift the payment system, as we liberate data both from the provider level and from our public sector in terms of open data, that we can fuel new products and services that will make a ridiculous amount of money and solve our nation's health care problem at the same time. Wouldn't that be nice? Second, I'd like to talk about our educational system. Now, how many of you know the size of the United States educational system? The K-12 market. It is roughly the size of the U.S. pharmaceutical sector. Now anybody knows what percentage of revenues the pharmaceutical sector reinvests in research and development; anybody want to take a guess? It's about 17 percent of revenues are reinvested in research and development. Now how many of you would like to guess, or could anybody please tell me what percentage of revenues in our K-12 system are reinvested in R&D Does anybody know what the R&D engine is for our K-12 system? 0.1 percent. The K-12 system is largely the same as it was at the turn of the 20th, 19th, maybe 18th century.

Teacher, instruction, classroom; what are we going to do to move this system to a 21st century model that emphasizes mastery of the learning of the material over the seat time in the class? As we move from print to digital learning objects, we will start to see this shift from seat time to mastery. And what is that we're going to be doing in Washington? We're going to try to fix that research and development pipeline. The President has called for an ARPA for education and has seeded it with \$90 million of the proposed fiscal 2012 budget to design breakthroughs in learning. The President gave a speech at Tech Boston Academy with Melinda Gates and he called for the following vision: a digital tutor that's as effective as your best personal tutor and as engaging as the best video game. Someone will build that digital tutor, that person will make a billion dollars, and they will solve the American educational system. Again, earning a lunch at the White House mess. We've seen this in action. DARPA, who believes in a high-quality workforce, invested in a program called, "Education Dominance". It's DARPA, it's the military. They can call it "Educational Dominance".

And they studied the best teachers in United States, and what they found was you don't record the lecture and push play. It isn't about finding the best lecturer. The best teacher has personalized the instruction based on the needs of the student. So what this meant was we need a whole new machine learning system that understands how the child learns and serves up the right learning object based on the style of the student's needs and the material that's relevant at the time. Now we have yet to invent this at scale, but educational dominance did a prototype. They took kids that were 17 years old into the navy, 16 weeks of training through this program at their pace, they outperformed veterans who've been on the job for seven years in IT networking skills. We're going to scale up the R&D engine. We're also trying to find ways to scale new ideas by introducing an innovation pipeline management program we called the, "investment innovation fund". Second year that program's coming up that allows entrepreneurial ideas to come forward, to close the achievement gap, test those new ideas, validate them through some kind of market assessment, and then allow us to scale the best and brightest of those ideas throughout the country. Over 1,700 applications came in for 49 slots, but in the spirit of open government the President, which our program required a 20 percent match, the President called on the philanthropic community.

Over 40 charities came together with a common application. In 30 days, when we listed the names of the 49 finalists and told them they had 30 days to get their 20 percent match, this single application and a web portal called the foundationregistry3.org surfaced \$63 million a majority of the match generated. Now what's even more exciting about this; J.P. Morgan as a donor advised fund, high net worth individuals logged into the portal and many of them personally contributed their charitable dollars to support applications that came through the I3 fund programs that they never would have heard of before coming from every corner of the country available. And again, in the spirit of open government, data.ed.gov; you can download summaries of each and every one of the applicants in case you feel inspired to see what's out there in terms of new ideas that are worthy of your time and attention. The third challenge is to unleash a clean energy revolution. Earlier this morning, I gave a lecture at the Connectivity Week to talk about importance to achieve the President's objective of 80 percent of our energy source is coming from renewable energy by 2035. We need a modernized electrical grid that would allow us to incorporate these renewables. So the President has called for a modernized smart grid and we need entrepreneurs who can come in and help turn this modernized grid into more energy efficiency, more grid reliability, and the ability to integrate these new renewable sources. Now, I'll give you an example.

Again, in the spirit of research and development, we're investing an ARPA-E on the entrepreneur called GeneSiC in Northern Virginia. They're going to shrink today's transformer from 8,000 pound beast with no intelligence in terms of smart electronics, to a 100 pounds suitcase with modern sensors so that it can start being an intelligent part of the network. Now hopefully these prototypes, if you will, will demonstrate their efficacy and will start to enter the market in scale. But it's also about opening up new standards. Standards for how you and I as consumers can grab hold of energy data. Just on this

campus, Tina, on my walk here I ran into these two high school students that came to visit me in Washington about a month and a half ago. These two students live here in Northern California and they asked their school system if they could invest a few thousand dollars to pull out the energy data in real time so they could see what they're consuming and when. And Tina, the gym would have the air-conditioning go on at 2AM and to their knowledge, there weren't a lot of students in school at 2AM in the gym. By finding out that the control systems weren't quite working the way were intended, they were able to adjust their HVAC, saving the school system \$30,000 in a year. How many opportunities are we leaving on the table because we lacked the knowledge of what's happening.

How do you and I know our energy performance? We get a bill in the mail at the end of the month, and that's the degree to which we instrument our energy consumption. Ask Google and Facebook how much information they have on you right now. A little bit more than one piece of data a month; they're instrumenting your social graph. We need to instrument the energy sector, the health care sector, the education sector. And by doing so, open up opportunities for you as entrepreneurs and innovators to build the algorithms, apps, the tools that would allow us to solve these challenges. And move out of a political stalemate that has plagued Washington to a new model that allows us to achieve our objectives in the spirit of entrepreneurship by harnessing the power of technology, data and innovation. And what I'd like to end in is a few stories of how we're doing this in Washington, and how you might participate. Because it is our thesis right now that there's never been a better time to be an innovator. And that thesis is built on three ways, we are tapping into the spirit that all of you embody. Number one, the triple bottom line model; have it your way, Burger King, whatever you want to call it, we're publishing data on data.gov.

We have over 300,000 data sets freely available, consume them, do whatever you want with them and build valuable applications. Some of them might be for fun. My wife and I have two little kids; I have to install the infant car seat. It sucks, it's hard; you got to squeeze the thing and you think your knee in there, and you got to jam the thing in. It turns out a majority of Americans poorly install the infant car seat. Tina, did you know that the National Highway Traffic and Safety Administration has a database of the ease of implementation for every car seat sold in America. And did you know they have a database of every location that is certified to install that seat correctly? And when someone had heard about this problem not unlike the students in this room today, a transportation camp attendee, that weekend having heard the problem hacked an app, identifies your geolocation and finds the nearest place where you can go to have that car seat safely and securely. Again, your data, build the value whatever you want, that's the American way. Second, we love Clay Shirky. Clay Shirky has written a book called, "Cognitive Surplus," that's what fuels people who want to voluntarily contribute to Wikipedia and open source projects.

What if we could tap into the cognitive surplus in this room to solve health, energy and education? You may not want to have a start up in this business, but you might have an idea so we launched a web platform called, "challenge.gov," to allow each and every one of you the chance to solve problems in teams without much headache or friction. Come on in and play. The First Lady has one up there called the, "recipes for healthy kids for chefs", come up with the best recipes that keeps school menus healthier. All the way to cool and innovative apps and products, which we could talk about all day and night. Last, certainly not the least, the stories that I'm going to end with and I'm going to end with them rapidly that we have a philosophy in Washington that if we're going to tap into your entrepreneurial spirit, we have to be responsive in kind. Because it turns out, Washington can contribute to your entrepreneurial capabilities. We can release data, we can engage in standards activities and we can invest in pretty competitive R&D collaboration. To manage all of these, we need the capacity and so we've been recruiting people from the entrepreneurial sector into our agencies. Example one, people that are building value on their own data. The Alfred brothers from San Diego found out that 401K management fees vary tremendously based on the size of the company.

If you work for a small business, you could pay 5, 7, 8, 10 percent management fees. You work for Stanford you're probably paying 1 percent. They cumulatively added it all up and said \$4 billion of access management fees are going to the companies, not into the pockets of folks with their retirement. How do they find all this out? Open data. The labor department collects the management fee information for every 401K plan in America and thanks to President Obama's open government directive, we gave them that information in machine-readable format and got them the data they needed to plot their diagrams and prove the problem. And now, they've build a startup hiring 30 somewhat people and growing, making a business out of closing that, creating an arbitrage. Doctor David Van Sickle lives in Madison, Wisconsin about an hour north, does not have broadband in his house, identified or built a GPS chip on asthma inhaler that calculates, tells you where you're located in the time you pumped you asthma inhaler. By crowd sourcing that data, he finds environmental factors and it encourages you to better manage where you are and what you're doing so that you can avoid uncontrollable asthma. And his little prototype, he cut uncontrollable asthma by over 50 percent. Folks, people with uncontrollable asthma cost the health care system \$3,000 a year.

Data, lowering cost, improving value, Dr. Van Sickle. Bob, Dave and Andrew are three random dudes here in Silicon Valley, who worked for a company and found out about this open data business, looked for the largest file available; the largest file available was the Federal Register, which is the newspaper in legalese that tells you what's happening in Washington every

day. These guys grabbed that data and turned what was only accessible to lawyers at Washington, into a pretty simple to use and easy web experience so that you and I could actually figure out what's happening in technology today. I actually use this. It's a heck of a lot better than reading the Federal Register in the normal way. Well, after they won the apps for innovation contest that the consumer electronics association, three months later the archivist of the United States, or AOTUS as we call him, picks up the phone and calls these guys and says, "Your design is a hell of a lot better than my FederalRegister.gov. Could you take over the site?" And they did. Bob, Dave and Andrew came to the 75th anniversary ceremony for the Federal Register where they filmed the National Archives movies, the movies that's National Treasure. You know, that's pretty cool stuff, they're sitting there on the stage.

Bob, Dave and Andrew, you've got to give them some love. Professor Wolski had an idea to create an Amazon cloud for universities, was successful in scaling it. His first customer was NASA. His proof of concept was funded by the government and now he's launched a startup and he's become a wildly successfully entrepreneur in Eucalyptus systems. Katie Stenne. I love Katie Stenne. Katie Stenne came out of Google, came into Washington to work of us in the new administration. Katie's now at twitter, but during her tenure in Washington, you remember the crisis in Haiti? Folks, when the earthquake hit Haiti, they lost any functional 911 service. No functional 911 service. Within three weeks, Katie organized a group of 40 entrepreneurs, nonprofits, innovators, many of them are living here in Silicon Valley and they created an instant 911 system.

Folks could text message their problems to 4636 at no cost. That information was sent on the web. Entrepreneurs then allowed to find Creole to English translators, turning Creole to English, disseminating those messages throughout the recovery program. And wouldn't you know it; 40,000 messages were translated. Average turnaround time for when someone posted a problem to one might where addressed by a first responder, 10 minutes in a world where they had no 911 system. And our friends in health care. My friend Peter Levin, a startup successful entrepreneur, created the blue button program that allows any veteran to download a copy of their personal health data safely and securely. Over 300,000 members of our active duty military, our VA, and our Medicare populations have now downloaded their data because in 90 days, Peter and his entrepreneurial team came together and built the prototype and now, it's been wildly successful. The President mentioned it in the state of the union. Arian Malik was a vice president at RelayHealth.

It turns out doctors couldn't email health records between each other because it violated patient privacy and security. Arian came in to run a 90-day project to get the private sector to agree to a technical specification for safe secure email called the, "direct project". It was so wildly successful that one year to the day when we launched it, 95 percent of the vendors in industry have pledged to adopt the protocol. A protocol built by Arian and his team. This is the story of Washington. These are the people that were gathering to build it and it is our goal, our hope that this infrastructure that we're building will support you as the innovators of 21st century so that you can solve the health, energy, education challenges, become wildly financially successful at the same time, and help your country. Thank you so much for your time. All right. I would love to hear any questions you might have; skeptics, criticisms, cynics. Any feedback you have, I'm all over you.

What do you got? Yes, sir? OK, not you. I'm just kidding. You may go first, yes please. So you've talked about some areas where the government needs to innovate. We're still dealing with the banking systems that's born in the industrial age and regulated that way. So some of us conceive of a bank for the information age all the high transparency ethical bank. Treasury is tone deaf, the economic council is tone deaf. These are areas where we in Silicon Valley do something more than eight hour waiting, service sideline of banking industry into it. Well, we don't have an advocate. We don't have some ...

So the question that I'm hearing is whether or not we can have a 21st century banking system that can fit the needs of where we are today. I don't have an easy answer to the question but I'll make one observation. One of the President's priority pieces of legislation was to create the Consumer Financial Protection Bureau because there were too many tricks and traps in our credit card system. Your bill statements would change in terms of what you owed, you didn't quite know what the reimbursement rates were on the rest. Our mortgage system is kind of funky, you don't really know what your interest payments are going to be when you sign your mortgage papers. There are whole range of areas we're we've had a lack of awareness and understanding in transparency. So in the spirit of a lean government startup, the agency won't even be officially born until July of 2011. Last week, they launched a cute little game called, "know before you owe". The law says we've got to change these mortgage forms and make them more user-friendly. If you visit knowbeforeyouowe.gov, you could actually vote on different versions of what the new mortgage forms should look like.

If you click on one versus the other, it asks you for feedback. What's working and what's not working in the other case. So we're trying to bring little startup feel to have the agency does its job all towards making sure that we have a banking system that works. Now, leaving aside the question of how we regulate the banks, there's a broader question of whether or not we can incorporate modern capabilities like mobile wallets, NFC communications in the like. And one of the policy tools we have that I didn't speak of. I talked about challenge.gov, but the law allows the federal government to engage in prizes, in competition policy so that now we can actually do some things to spur some innovation in areas that we hadn't thought. If you visit the Treasury department's open government page, www.treasury.gov/open, you can contribute your thoughts about what kind of

challenges in prices they might run to modernize the nation's banking system. Who knows if the banking system of the future is run by your cell phone company? And that's one of the questions that is exciting, and I'd encourage you to participate. Other questions? Students? Yes, in the back? The provision section for your aspiring entrepreneurs, you mentioned something about stapling green cards for the stem students for PhD and Masters, and something about the startup visas. What do you think is the timeline for those two to be actually implemented and students take benefits of them? So the question is whether or not the policies that the President outlined in his speech on high-skilled immigration, specifically the ones that are on stapling and on startup visa, when might they come into fruition.

Part of the challenge is that Congress has to take action. So the reason the President delivered that speech and clarified the economic arguments for immigration reform, was to create some space to have a civilized conversation in communities around the country. Which hopefully would lead to some bottom-up support, and therefore congressional engagement, so that we could have a group of people that would want to think across the table about what's possible and how do we move this thing forward. Where we are right now is the current immigration is broken and we all know this. Our economy is suffering because we haven't gotten this right and the President is putting more attention on the fact that we need to address this and to do so now. I wish I was a political prognosticator to tell you if and when this law will pass, but the President has put his views on the table, and is encouraging us to have these conversations neighborhood by neighborhood in the hopes that it will lead to some group of people coming to the table and negotiating in good faith. Having said that, we didn't want to leave that all up to nothing in the sense of not everything we do is going to be based on waiting for a new law. We have also taken decisions that are in our administrative control. So for example, if you're a graduate student you could stay in this country for OPT; practical training. We've expanded the number of degrees that qualify for the 29-month OPT stay versus the traditional 12-months.

And by expanding the number in medical areas and in computer science and so forth, we hope a number of students can benefit today by expanded list of OPT eligible fields. So we're able to do that and we announced that about 10 days ago. Yes, sir? As you mentioned, network infrastructure is being key to growth. And I was wondering right now, most of the network infrastructure is private and how do you foresee that evolving in the future? So the question is network infrastructure. We absolutely embrace private sector digital infrastructure. The question is whether or not we have the right R&D mix. So if you look at New Jersey where I come from, thousands of engineers including my dad were part of this ecosystem that worked at Bell Labs, Bell Core -- you name it. And those assets, let's just say they're not what they used to be. So the degree to which our networking infrastructure has had the kind of research and development emphasis over the last decade or so, the President has called for a portion of the incentive auction proceeds, roughly \$3 billion of the \$28 billion of expected proceeds if the spectrum legislation were to pass. To invest that, maybe 12 percent of the revenues are tapped into a research and development program run by the National Science Foundation and DARPA and other agencies that are focused on this domain, all to take advantage of you as students, but also to enable the private sector to commercialize those great ideas and to design the new applications and infrastructure programs of the future.

So that's the spirit; privately run but juiced with some R&D. Yes, sir. Practically, everyone I know would rather be an entrepreneur in one of these fields than go off and work for someone for the man, or whatever. But there are other problems besides just having the open information than the encouragements and support from the government to becoming entrepreneurs, such as affording health care, or rent in the Bay Area. How can you help us with those concerns? You know, it's really funny that you mentioned that. One of the unintended consequences of the President's Affordable Care Act was to allow students to stay on their parents' health insurance until the age of 26. We've gotten a ton of feedback for young people, typically undergraduates, who are now leaving college to start a business because they don't have to worry about their health insurance cause they can stay on their parents' plan. That's live right now. You can qualify for that service. We didn't quite realize that that might be an enabler for entrepreneurship.

So that is the short answer. Startup America Partnership is finding other creative ways to support, nurture, nudge, encourage folks to actually get going, and that's what I meant if you visited startupamericapartnership.org, you could see the litany of private commitments that have been made to support those individuals. In the back, yes, ma'am. I'm currently in a global bio design process, basically projected that immigration... Is your Professor Dr. Anek Kumar, by chance. Uh-huh. Yes, he's the man sitting right over here. That's basically projected that medical innovation is going offshore because of the stringent FDA policies. So for the entrepreneur, it's impossible to innovate in the United States.

What are your thoughts on that? The question was whether or not the FDA's regulatory policies are shifting innovation overseas and it's a very thought question and I appreciate it. The FDA has released a set of unprecedented transparency provisions to disclose what it is that they're doing operationally. They haven't had any law changes in this administration except for the expansion of the ability to manage tobacco and some food safety items. But in terms of what you're describing, it's the same FDA as it was years ago. So the question is whether or not the FDA has been forward leaning enough in reform, so that it can encourage innovations to thrive in the U.S. It is for that reason that in January they unveiled the innovation pathway. A new strategy to streamline and simplify applications into the FDA that have the potential to serve big challenges in our current biomedical device space. So we're hopeful the innovation pathway will address some of these concerns. We've certainly heard

a great deal of feedback and I can assure you, the leadership under Dr. Hamburg is taking them seriously in looking for ways we can improve our internal capacities.

So I appreciate the question. Other students, yes? I think the same question. Another great problem that we face, we have a lot of ideas that are certain to improve health care and the system, but they do not constitute the \$500 million or billion market that the VC needs to fund us. And we just keep wondering yes we can do something but we don't have the funds. Can the government help us? So the question is on the business case for innovations that may not have the market size to compel private capital. Harder question; I would answer that in three parts. Part number one, some of those devices and products actually are investments one would make if I was encouraged to keep people healthy and out of the hospital. So it is possible that the accountable care organizations who will organize and build the programming, if you will, might on their own choose to adopt products and services under a different reimbursement regime because those products and services are actually going to be helpful to keeping me safe. And so, that has a category of impact to the investor's thesis that I think would be relevant to the market discussion. Second, we are investing in research and development proof of concept centers.

The commerce department issued out a challenge grant to promote all kinds of commercialization activities, and a million dollars is awarded to a value-based engineering program in Akron, Ohio, focused on medical devices that can be engineered in the United States to tackle other sectors that perhaps have been more unmet need. And they have been collaborating with Dr. Kumar and others to find ways in which Akron, Ohio might be a hub for some of those startups. And so there's an ecosystem forming there where there are resources that have been gathered to support proof of concepts. And then third, in our increasingly global economy, it is likely or possible that innovations that serve global needs might be modified and enhanced at scale, and brought back to the U.S. to serve domestic needs. That is a trend known as, "reverse innovation," and we're talking a great deal of interest in understanding that trend, thinking about that trend, and engaging in the spirit of open innovation about that. Tina's going to about to pull the plug. Last question or done. OK, this guy over here in the blue shirt.

Yeah, you. You, brother. Yeah, you. I'm trying to launch our project that is cutting the global oil consumption by... Oil consumption by? By 20-30 percent. Hell yeah, you are brother! What's your name? Give me your card. By taking the usage of ground transportation system where there are always a problem with the politics that of course, you have to change the traffic to enable outlining autonomous running of vehicles, You operate in a public space. But we had a lack of incentive to change the rule. So if you would become a president... ..Would you decline the proposal.

I didn't get all the mechanics of the question, but it was about an innovative model of the lower fuel consumption, dealing with autonomous vehicles on the road and how we integrate vehicle-to-vehicle communications, and vehicle-to-infrastructure communications. Ironic that you mentioned this because on Monday, I held a roundtable of CTOs from Mercedes Benz, Toyota, Nissan, GM, Chrysler, their stakeholders in between, to ask the question how might we kickstart smart transportation. That is how might we get the infrastructure to communicate with vehicles, vehicle-to-vehicle and everything in between. Because, as part of that wireless innovation fund I outlined where we're going to invest the \$3 billion from the spectrum proceeds. We allocated a \$100 million of it to the question you just asked, how might we modernize our transportation system by creating more capacity through commercial communications, technologies so that we can in fact introduce some of these savings. It turns, Tina, UPS trucks save money by turning right. If you build your routes to turn right, you're not idle at the left turn. What's up with that innovation? So this is something that we're very focused on. We have a research and development arm in the Department of Transportation that's called, "RITA". Look at my blog to see all the people, whitehouse.gov/cto and you can contact any of the CTOs who came to visit my summit and ask them if any of the private stakeholders by participating in your work.

Thank you so much for having me, and good luck.