

# SMART CITIES SMART CITIZENS

**BETHSIMONE**NOVECK

*Talk Transcript*



**GOVLAB**

# *A Presentation on Smart Communities and the Opportunities of Big Data Given to the International City/County Managers Association, Boston, Massachusetts September 23, 2013*

*Last month, I had the great honor to keynote* the International City and County Managers Association (ICMA) *annual meeting*. At ICMA I met officials from Dallas, Oregon and Dallas, Texas, Carlsbad, California and Bedminster, New Jersey as well as leaders from Kenya, Canada and Tajikistan and a lot of places in between. I met folks with the title of Mayor, CFO, Head Librarian and Chief Nerd. They all reported that they are facing real challenges that innovation could help to address. These range from:

- ▶ How do I skill an aging workforce in innovation?
- ▶ How do I mine the know how of that aging workforce?
- ▶ How do I deal with the privacy challenges that come from opening up local data about records and real estate?
- ▶ How do I create an innovation lab at a Community College not just at Harvard or MIT?
- ▶ How do I find other people working on the same challenge that I face? How do I find data relevant to the challenges I work on?
- ▶ How do I “do big data” in a small town?
- ▶ How do I combine face to face with online engagement to the end of solving problems?
- ▶ How do I bring open governance to a school district and use students to hack their own school?
- ▶ How do you create an entrepreneur in residence program in local towns?

My talk focused on the opportunity for those who govern to use a variety of new technologies to tap the intelligence and expertise of their communities. Through myriad examples (available on SpeakerDeck [here](#)), my goal was to persuade those who lead that consulting citizens is an economic as well as a democratic imperative. Done right, consultation helps cities make better decisions informed by relevant knowledge, specialized expertise and creative thinking. But it’s hard to do well and we haven’t had much success. In this talk, I show what’s working around the world and offer some suggestions for what leaders can do today and what we might be able to do tomorrow.

Here is the talk as presented (lightly edited for clarity):

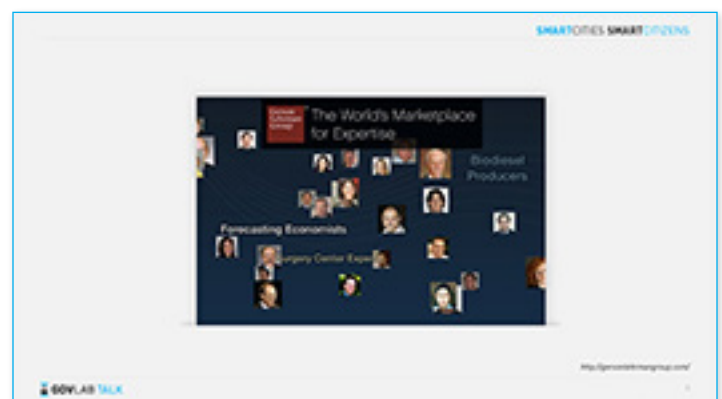
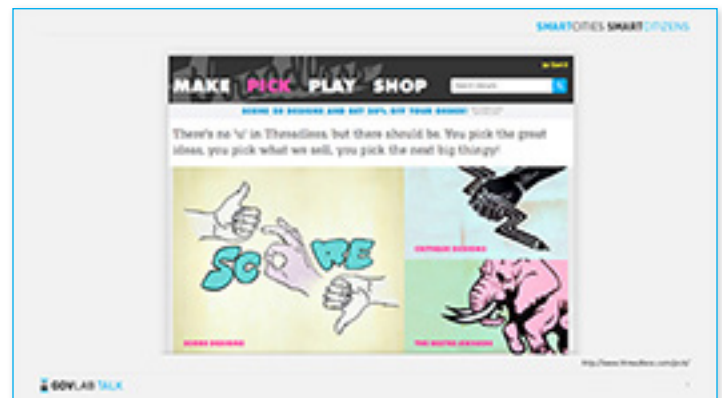
Thank you very much. Thank you. Good morning, good morning. I always want to stop after the introductions. They are the best part, at least for me and my mother. I am very delighted to be here with you and to be in Boston. This is really the ground zero in many ways of thinking about open innovation. We're just up the street from MIT and from Harvard where people like Henry Chesbrough teach and work, or Karim Lakhani, or Eric von Hippel whose works many of you may have read.

They are the people who have brought to us the ideas and helped us to understand how in business we are coming today to rely upon not just the employees in our firms, but the customers and those in our networks to help solve problems better. Eli Lilly, for example, learned a decade ago when they started their Open Innovation project working with a company called Innocentive that they could solve hard pharmaceutical R&D problems by outsourcing them, if you will, by crowdsourcing them to a community of what's now several hundred thousand solvers. Many of those solvers are now working also on public sector challenges.

There are companies like Threadless, who many of you may have ordered from, where you can buy a t-shirt, not made by the company, but made by the customers and then voted on by the customers and sold in the store. We all shop in the Apple App Store. Those million apps, they're not made by Apple. They're made by you and by me, by those people who were at the ICMA hackaton yesterday. That's where the value is generated.

A company like Facebook, 1.1 billion active users, bigger than the traditional media companies that we all know. We can put CBS and Viacom together and still fit them within Facebook. How many employees? Anybody know, how many employees work for Facebook? It's about 3,000 people. It's tiny. Probably smaller than the civil service that work in many of your towns yet generating huge amounts of value because they're relying on the users to help them.

There are in every business sector now the ability to use what are sometimes called expert networks, such as a company like Gerson Lehrman [that I can use if] I'm a lawyer trying to find an expert witness for my trial; if I'm a bank trying to make an investment decision, I can turn to them to help me find the best expertise. Again, this is the process of open innovation.



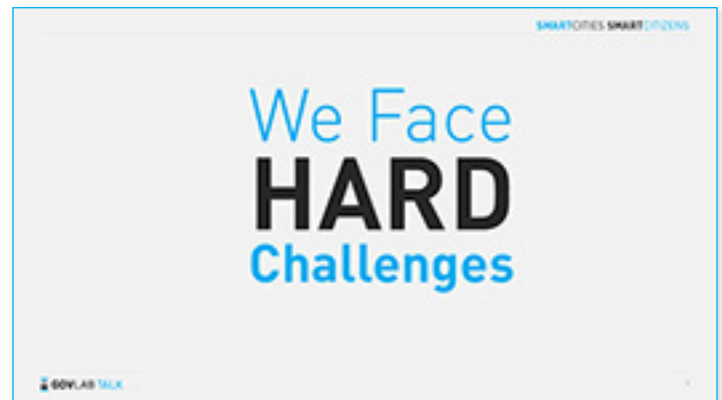
These examples are all very outcome-oriented. They lead to real results but the focus is on the bottom line. As we know in the work that you do and in the work that I have been privileged to be a part of, we are working very hard, not on private, but on public challenges.

We're focused on the public interest. How do I deliver better services to the citizens in my community? How do I safeguard the history and the values of the town in which I work? How do we do our part in protecting the environment that's in our backyard and the well being of our own citizenry? How do we act as stewards to safeguard the taxpayer dollars with which we have been entrusted? How do we catalyze the flourishing and the creativity of our friends and of our neighbors?

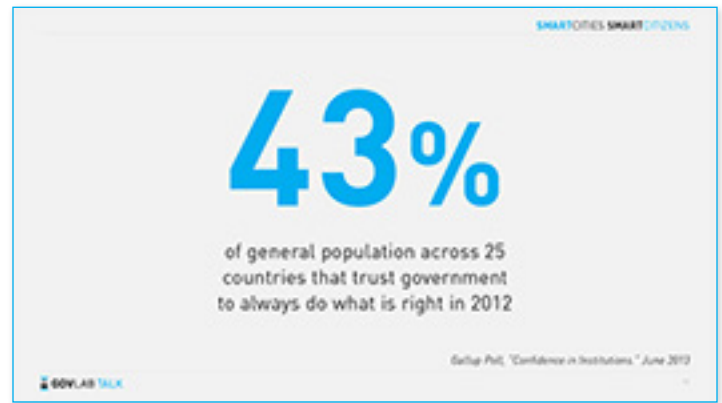
These challenges are difficult. They're especially hard under the conditions that we face today and under which you have to work.

This is the era, of course, as we know of declining trust in government.

It's a problem not just at the national level, it's a problem at the local level, and it's a problem internationally.



All over the world, people are coming to realize that the traditional institutions whether it's the media or religious institutions or government in which we have put our faith are not holding water with people. Trust is declining.

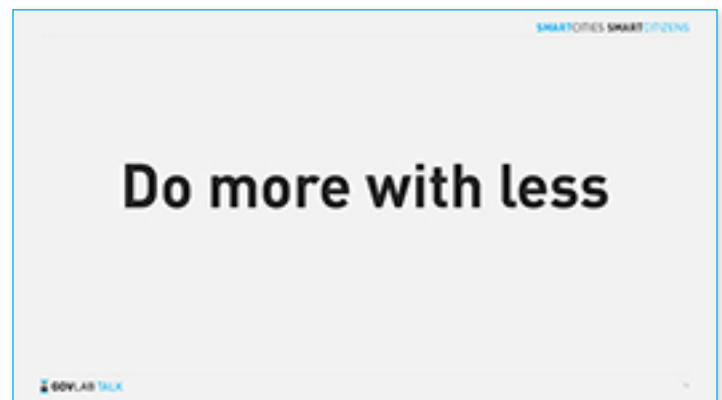


There's increasing polarization, which is partly to blame, where everyday -- whether it's in Washington or in many of the communities that we live in -- as the President said:

"Everyday is Election Day". We are embattled and embroiled in politics. As a friend of mine likes to say, if you were to take C-SPAN and ESPN and turn off the volume, it would look like the same channel. I don't know if the joke is funny but the point is politics is a sport and the media likes to cover it. It doesn't like to cover governance, doesn't like to cover problem solving, the things that we work on, instead of covering the blood sport that is politics.



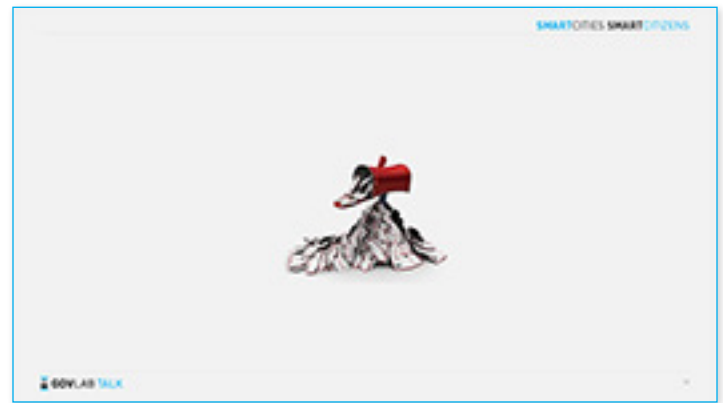
Above all, in this economic climate, we have to be able to do more with less, to deliver those services with ever shrinking budget and we also have to be able to be innovative, to deliver new kinds of services -- as in to do better in how we serve our citizens with less money.



There are no more hours in the day. Just as you're having to work on the same service delivery and problem solving that you've always done, you now have the great benefit of social media and the fact that you have to deal with an Inbox that is overflowing



It is not just your phone ringing off the hook and your email inbox but now Twitter and Facebook and Foursquare and I don't know what else, and there's no more hours in the day than there were before.



Open Innovation, I would argue and I hope to convince you of today, is the future not just for the private sector and for business, but is vital for the public sector. It's as important for Manor, Texas under the leadership of Dustin Haisler. I think he was about 22 when he started the Manor Labs. He had this idea that he could tap the intelligence and expertise, not of the few people who work in the city government in Manor, there are not that many of them, but in fact the citizens of Manor and of the world beyond to help solve real problems.



He started the Manor Lab to get good ideas from people including from members of the town who said, "You know what, there's a grant we can apply for in the neighboring county of Travis, Texas that can help us put computers in our cop cars." This is before the iPhone. "That would help us to a whole lot of services better and more cheaply," and the citizens helped to write the grant proposal. They didn't just come up with the idea.

He had the clever thought of offering incentives and prizes to people who participated, and this worked out well. You could win things like ride along with the sheriff for a day or get a Texas cowboy hat. It worked out really well until some of the winning ideas for improving delivery of services in Manor started to come from people in China. It's a little expensive to ship the cowboy hats there.

The point is is that we have tremendous potential to use our creativity, to use the diversity of talents and skills that we have and that those we work with have. We have the smarts and today we have the tools that include data, as we'll talk about, including social media, including new kinds of collaboration tools. We have continuous access to the best learning and the best knowledge in the world from our laptops and from our phones. We have the technology, as they say, but we aren't quite in government up to the task yet.





We have a rather outdated design and outdated approach in many cases. For most of us, government still looks like this.

It's the world of inefficient bureaucracies to many people, excessive form filling, and frankly, it's the challenge of the fact that we tap the intelligence and expertise -- we work with our citizens -- not everyday but only Election Day. What we're doing is underutilizing that potential for open innovation in our own communities.

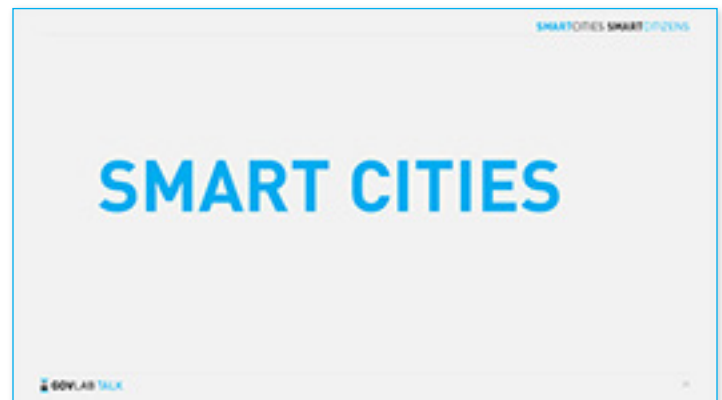
It's no wonder: the design of our governments is such that we have an 18th century model of representative democracy, pretty innovative and advanced for each day as a way to manage a growing and distributed population and get their ideas channeled in to how we make decisions. We have a 19th and 20th century system of bureaucracy that's designed to centralize the management and flow of information as a way to make better and more independent decisions.

These kinds of practices, advanced for their time, I think have become increasingly outdated because they're not helping us to utilize the technology that we have to tap the diversity of skills and ability out there. When we think that this is the only way people can engage, number one and number two, when we think that the way people engage always has to be the same as in voting, then we lose this opportunity to really leverage the diversity of people in our communities.

The key to smart cities, I would argue, and I want to put this first and foremost before diving in to talk more about data. The key to smart cities is really smart citizens.

Today's problems are too complex; they're too interdependent. We can't solve them by ourselves and we have to take advantage of the advances in technology that we have whether it's the platforms for open innovation and collaboration, whether it's the big data platforms and cloud computing that we have to store that data, the visualization tools to make that data more intelligible and accessible to people as knowledge, and above all, whether it's the advances that we are coming to understand not from the sciences and technology, but from the social sciences about the incentives that cause people to act.

Some of you may have read the book "Nudge" or heard about this concept of the Nudge Unit. They've opened one in the UK. They're starting one in Washington. The idea is basically to take advantage of behavioral shifts and changes in order to



condition new kinds of behavior. In other words, when I can ... it's the simple idea as you saw in the movie that was just shown earlier than when I go around and maybe explain to people, I give them a smoke detector and I explain to people how to use it. They are X times more likely to actually install that smoke detector. It's the combination not just of the tools but also of those insights about how to get people to adapt the innovations that are actually quite powerful.

[Using collective intelligence to govern] is not a new idea. Let me make very clear at the outset, as the scholar at Stanford, Josh Ober, a great classicist of ancient Athens explains, that in Ancient Athens they had the concept of what they called the "volunteer expert." The important thing about Ober's description of what happened in Athens is not just that they practice what we would call open innovation or collaboration that the citizens were involved in running the government and in coming up with good ideas for how to do so.

He goes on to prove through data on a thousand city states in Ancient Greece that Athens' superior economic success, superior military performance, superior historical longevity is the result, not by accident but directly caused by its model of what we would call participatory democracy and engagement. It was this ability of having an institution that was designed to aggregate knowledge for decision making as opposed to merely assessing people's interest or their opinions, but to really tap the citizenry that actually made a difference.

I would say the same thing is true for us today. Participation, engagement from citizens, is not simply a nice to have, it's not simply the right thing to do, it's a must have for economic performance.

Now you can say that sounds all well and good and it's very nice that it worked in the simpler days in the Ancient Athens or that this all sounds right in theory. But participation is really hard.

What happened to that part about the overflowing mailbox and the no more hours in the day?

Participation, many of us really when it comes down it, truly believe it doesn't work. It's really hard to do. People are not going to participate all that well. They don't know how hard it is to make the decisions that you have to make on a daily basis. They don't have the benefit of that know-how. In fact, engagement is going to be simply too hard and not worth the cost.





Churchill probably best summed it up when he said: “the best argument against democracy is a five minute conversation with the average voter.”

Really, “people ain’t all that bright” and they’re not going to be all that useful. At its heart, let me admit that’s what most of us I think truly believe. Therefore there’s a great deal of resistance. We practice [engagement] in pockets. We try it, but how do you actually do it?

I can confirm this from experience. As you heard from David in that glowing introduction, thank you, I ran something called the White House Open Government Initiative. When we came to the White House, I am supposed to be in charge of the nation’s open government policy. It made sense to say: “Let’s put up a website, a brainstorming website, and ask people for their ideas about what our open government policy should be.”

What did we hear from them? It won’t surprise you. What they said was, “Legalize marijuana. Legalize marijuana. Legalize marijuana. Legalize marijuana and by the way, where is the President’s birth certificate?”

Here I am in the New York Times. My mother was happy. Nice picture and all of that, but why am I in the New York Times as being the sucker who is now opened up, turned on this megaphone, if you will, for people to shout at me, to yell at me, to criticize me, and to tell me about legalization of marijuana -- very hard to do right.

This [cartoon] is me lying on the floor, I like to think. You know you’ve arrived when somebody’s made up nasty cartoon about you. In this case, the open government was a good idea, but when it turns out to be giving people the stick to beat you with, it’s very hard to do and to have the faith that it can actually work.



Skip ahead a few years, and you may know that in the UK they launched something called the “E-Petitions Platform.” We started this in the U.S. called “We the People,” a petition site where 200,000 petitions have gone up and people have signed them to ask for everything from enacting federal gun control legislation to not-enacting federal gun control legislation, to promoting mandatory labeling of GMOs, to building a Death Star. (This was the most famous one that went up on this site.)

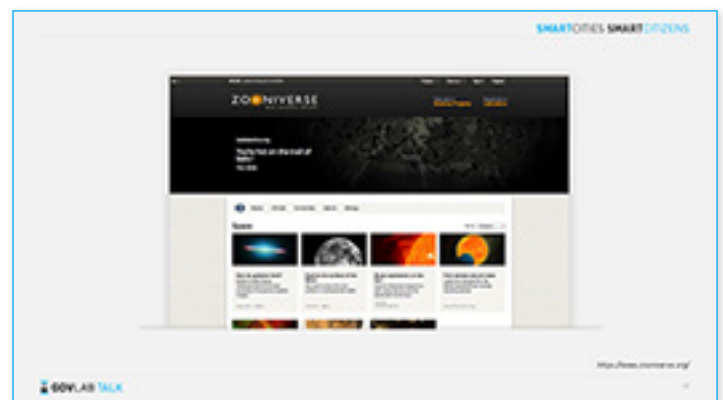
The challenge with a platform like this is you have people shouting at you, telling you build a Death Star, but what you need when you’re trying to make a decision and solve a hard problem, is data. You need examples. Tell me where else they’ve built a Death Star. Tell me how much it’s going to cost me to build a Death Star. Tell me about an example of where it works. Tell me where it didn’t work. I can’t make a decision based on two lines of someone telling me build a Death Star or label genetically modified foods or start the school day earlier or enact this particular piece of legislation. There have been 200,000 petitions with 13 million signatures but only 162 have received a response. Very few of these are translating into real policy, into real action.

Let me dig in now on the details and some of the how-to’s, the practical ways in which we can tap people’s expertise, not to participate in government, but to participate in governance, in solving problems, in working on the things that people care about.

Zooniverse is a great example of one of these. Some of you may have been on Galaxy Zoo which has started a couple of years ago as a way to help scientists tackle the problem of going through a large quantity of data namely pictures of galaxies and trying to sort and categorize them because it helps you identify how old the galaxy is.

What I think surprised people and what no one could have imagined is that it took 24 hours to get 70,000 pictures classified. There have been more than 50 million classifications done in the first year. People get excited in 50 countries about participating in Galaxy Zoo or Zooniverse, which is the parent project. Most notably in New Zealand and in Leicester, England, they seem to like to do a lot of galaxy classification. They were also participating in projects like one of my favorites: Old Weather.

Old Weather is a project to transcribe historic American shipping logs not because it’s historically interesting alone,



but what's in those logs? Weather information, the stuff that tells us about the history of climate that will help us to do solid climate change research is contained in these 19th and early 20th shipping logs. To actually transcribe them from the handwritten notes would take 30 years for any person doing alone. Instead the initial phase of the project was accomplished in a year all by volunteers.

Unless you think that people only have passion for cool amateur science projects like this, realize that I talked recently to the former Secretary of State in Missouri who told me that those same people in New Zealand who seem to like doing Galaxy Zoo, they also have a particular penchant for transcribing death records from the State of Missouri (so they can be digitized). Don't ask me why, what's going on New Zealand, but they really like their crowdsourcing and they got the entire corpus of historical death records from the community translated not in months and years at great expense and cost but in a matter of a few days by working with people.

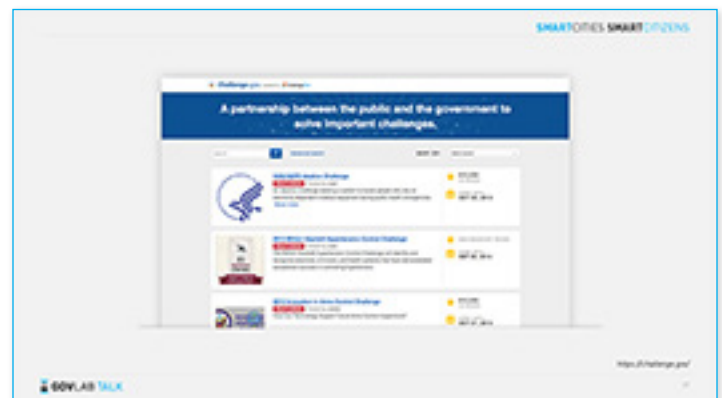
The point is you have to start with a problem. You have to start with a problem that you need to solve and the people might get passionate about. Not everybody will get passionate but there will be some people in your backyard, in your own community, and maybe further away that's actually engaged in helping you to solve a problem.

We created something in the federal government called Challenge.gov. It was designed to do exactly this, to have an agency put up a challenge, a problem, whether it's how to help kids lose weight or in the case of the Air Force Lab, how to deal with the problem of an out of control, speeding vehicle racing towards a checkpoint.

You can see the movie in your head.

Right there is the checkpoint: the American sentries have their machine guns. An out of control vehicles races towards the checkpoint (or you can substitute an urban crime drama, with an out of control car chase, you get the idea). It costs real lives when either that car is shot at with the cost of collateral damage and bystanders who get killed, or frankly the person who's driving the car who might get killed unwittingly and unfairly.

The Air Force said, "Perhaps there's a better way we can solve this problem." They put out a challenge on Challenge.gov and they offered a prize. A retired engineer in Lima, Peru came



up with this great idea ... We could frankly spend all day and you would not come up with this idea but when I tell you you're going to be like, "Oh, that's so easy. That's so clever." A little platform, a little remote control, those robotic little cars that your kids have that you control, out an air bag on top of it, roll the air bad unto the car, inflate the air bag, tip over the car. Pretty cool idea, I thought. But what do I know?

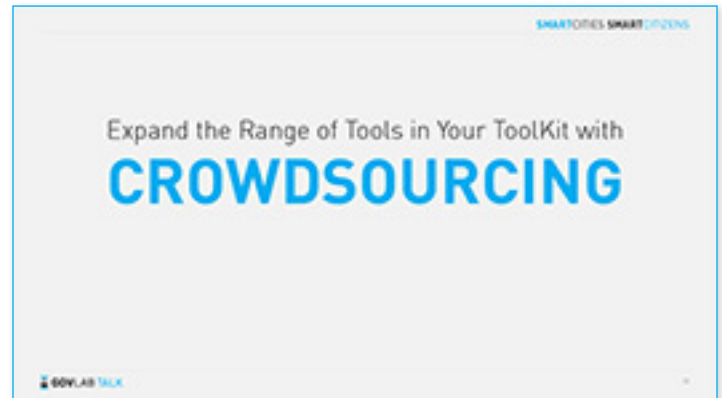
Now the Air Force is building and implementing it. The solution cost \$20,000, a tremendous savings. I think that's the cost of a toilet seat from a Defense contractor.

The people are getting real help solving real problems and it's not by asking them to participate in government, it's by asking to solve a problem that you are engaged with.

You got to expand the range of tools that are available to you by using what is really just called collaboration but what's often today called crowdsourcing.

Now, I don't want to get into it but there are actually 40 different academic definitions of the term crowdsourcing that one scholar has identified, but the simple idea is we can go online and we can ask people to work together and help us solve problems.

Crowdsourcing comes in a lot of different flavors and forms and I want to be sure to tease them apart because I think practically as you're thinking about what you can do, it's important to realize that there are these different flavors.



Some involved crowdsourcing ideas.

You can ask people for that idea about they had the air bag and the military checkpoints. You can do what's sometimes called ideation now, brainstorming, the electronic suggestion box, whatever you want to call it.

The city of Rio has introduced something called Rio Plus to get ideas from citizens about how to solve specific problems.



The National Health Service in the UK has asked both patients and its providers to come up with ideas to solve particular problems. They've gone a step further. It's not just giving some idea, but to actually then come up with teams organizationally that form collaborations with citizens, with providers, with business and industry to then help implement and take those ideas forward.



Crowdsourcing though and getting help from people doesn't only have to come in the form of suggestions. Just come back to these petitions problem, sometimes you don't need more ideas. You have plenty of ideas but you don't have the time or the bandwidth or the resources to get them implemented. One way that people can actually help you is by crowdsourcing data.





We'll say more about data, but I want to be clear that one of the things people could do is to help you get data.

Public Lab is a kind of DIY environmental science community. There's a lot going on in this participatory or amateur science world. What they do though is they don't transcribe shipping logs. What they do is they go out and gather data about a community's environmental health. They have the platforms. They help to organize citizens to actually do things, in this case, like balloon mapping where they're capturing aerial imagery of spill affected sites in Louisiana, Mississippi, Alabama, and Florida.

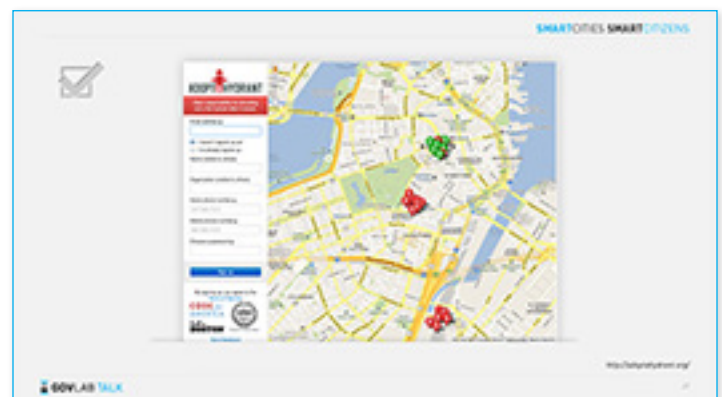
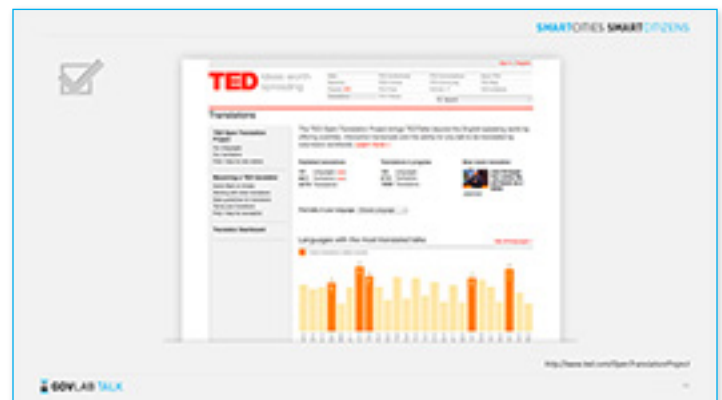
There are other groups that are like this, notably also in Japan after the Fukushima nuclear plant disaster that are organizing citizens to help gather about air quality, about water quality, about the conditions on the ground that can help with better governance and also with the better data collection that helps to drive better decision making

People can also do stuff, not just have ideas, but they can actually perform tasks.

We were talking earlier about TEDtalks. One of the things that TED instituted last year and many of you may listen to their lectures and speeches online is they actually started the Ted, Open Ted Translation Project. It's a global project that has 4,000 volunteer translators who've already completed 7,000 translations and have 2,000 more in progress. This is asking people to take advantage of what they know, a particular language that they might master and use it to make knowledge more accessible to people in the world, to create access by asking people to perform a very discreet and defined, and well understood task.

You may have seen Adopt-a-Hydrant which comes here out of Boston. Some people in the room probably have been involved in this project. It's exactly what it sounds like.

After the Snowmageddon that we faced in New York and that space in similar communities, the idea was to get a citizen to adapt a hydrant and to be responsible for ensuring that's it's shoveled soon as not just to wait around for a city service that maybe long in the coming because of an unexpected natural disaster. Honolulu has adapted Adopt a Hydrant not because



they have too much snow in Honolulu but similarly other communities are starting to adapt this idea on can we get people to take care of a phone booth, a block, a park and to take responsibility together with the community for doing the task in this case of adopting one of 13,000 hydrants in Boston.

Crowd sourcing has the potential advantage of actually also creating economic growth and helping to build jobs.

Now 99designs and things like it are very controversial because what you might think of as an outsourcing platform. You need a logo or a website done for your community, you can put it up compete it on 99designs and designers from around the world will actually compete to bid to get the project and the fees that you paid only to the winner. Many people don't like it because the losers don't get paid. They don't like it because they're worried about the fact that it distributes jobs to people potentially aside the community.

What was exciting about crowdsourcing work is twofold I think. Participation in these kinds of platforms help to make the citizens in your town more globally competitive and give them access to new markets. It also helps again to stimulate the idea of innovation and engagement and participation, and participation again in global markets. This is the 99design has already paid out over sixty million dollars to the designer community and hosted more than 243,000 design contests.

Opinions are, of course, another way in which you can use these tools not just to get people's ideas but their suggestions about priorities.

In this case this is a mobile phone platform out of the democratic republic of Congo that's being used in connection with a participatory budgeting project: getting people to help make suggestions about how to spend your tax dollars.



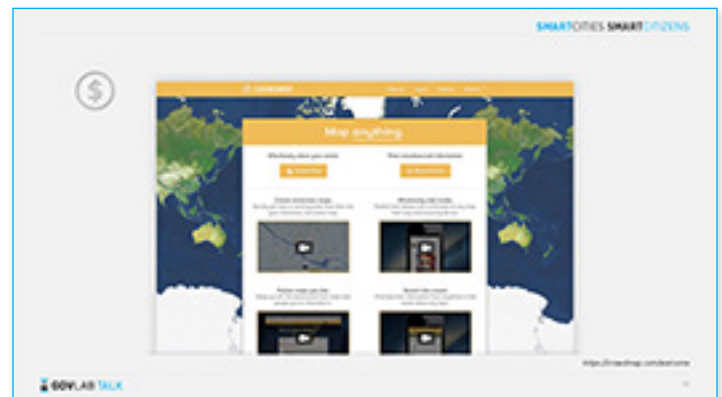
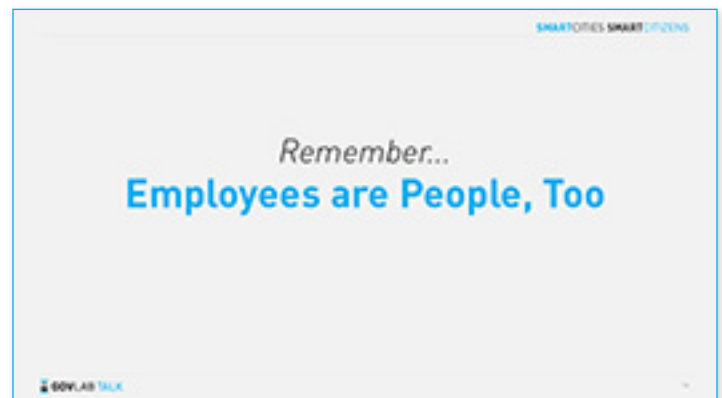
Similarly money can also be raised by taxpayers in the process that's often called crowdfunding. Now, many of you may have participated in Kickstarter and gotten your Pebble Watch off of Kickstarter or given to some other kind of project. It's increasingly being used in public sector projects.

There's also Spacehive out of the UK, where a Manchester business improvement district recently raised 38,000 pounds or about \$50,000 through Spacehive to create a free Wifi access area in the town center. There are other sites like it BrickStarter in Finland and Kickstarter that are again being used as a way to help affectively allocate taxpayer dollars to things that people care about and raise money for things that are outside the traditional budget cycle.



Think about how to get in better data from people (not just sensors) or what we might call social data. Keep in mind that employees, government employees, people whom you work with also have good ideas to share.

In Pakistan they face the scourge of dengue fever. In 2011, in Lahore there were 21,000 confirmed cases of dengue and 350 fatalities. They introduced a crowdmapping project using this free tool called crowdmap where they gave 1,500 city workers, they gave them smart phones and they asked them to tag where they saw mosquitoes. They also asked them to tag the incidents of disease and by using employees to aggregate data they were able to develop a program such that one year later, one year. The number of fatalities from dengue went from 350 to zero the number of instances went through 22,000 to 255. The impact was tremendous.



Again Rudi Bormann in the city of Buenos Aires reports that he organizes employees something called Gov Camp. "We do it every couple of weeks," he reports. It's sort of like a hackathon but it's only for government employees to get the people who are the frontline workers engage and delivering services to citizens that were part of the process, to engage within the conversation about how to solve problems.

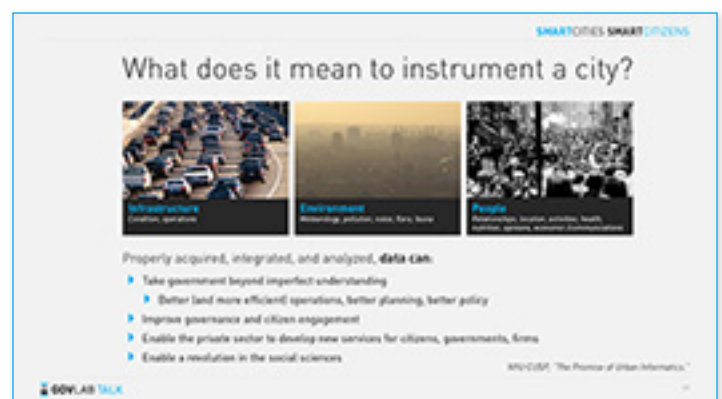
Where possible whether it's employees or whether its citizens you want to give everyone yourself and everyone data to get smarter about the problems you're trying to solve.

You want to inform the suggestions that you're going to get. You don't just want that Death Star idea. People need a lot of background about whatever it is you need to know in order to make a useful suggestion about how to build and implement the Death Star. It's not enough to simply make a suggestion disconnected from data.

Now big data is one way to do that. We've heard a lot of talk and you'll hear more about this concept of lot big, lots and lots and lots of data.

The idea that we can collect huge amount of it, this is what my colleagues down the street in NYU at the Center for Urban Science and Progress focus on.

They work only on New York City at the moment and they work only on the question of how do we gather huge amounts of data using sensors, using cameras, using things like measurements that can be taken by a plane flying over the city. As has been explained to me there's new thermal sensing technology that can allow you to know when somebody's turning on a hair dryer from 10,000 feet above.





We can gather huge quantities of data that can allow us to do all kinds of things and that data can come not just from sensors that are installed by the government but from the sensors that each of us is carrying: the phones that we have in our pockets, the wrist band that we wear from FitBit or Nike that can allow us to actually contribute that data.

Let me just be clear that you might hear talk, there's big data, it's one concept. Another one is sometimes referred to as small data or my data or midata. Small data doesn't mean ... small data is not little numbers. What small data is my personal data about me. I have colleagues who work on what happen when I get Whole Foods and Starbucks and Kroger's and Duane Reade or Walgreens to give me my data back that they hold about me. Together with the data that government may hold about me, together with what I have on my FitBit and my Nike wristband.

What we can begin to figure out about ourselves in our own life -- what sometimes called the quantified self movement -- when I can see all of this data match and grasp and I can see my own habits, reflected back to me, it may cause me to change my behavior: how I eat, how I exercise, what I do. This is the concept of small data.

Big data is data about our community, about all of us that's gathered from this large scale sources and it's increasingly a lot of it because there are cameras and there are sensors everywhere that are enabling us to do this.

If you take a look at these slides from CUSP, you'll see there are lots of things that we can do as policy makers when we can manage and work with this kinds of large scale data streams.

Sentiment analysis is another form, a kind of very specific form of big data if you will. It's one that sometimes more accessible to people. Its mining Twitter and Facebook looking for what people say about me in order to improve how I deliver services.





The DC government is starting to do this now: you can look at [grade.dc.gov](http://grade.dc.gov). They are using sentiment analysis to see what people are saying about the delivery of government services in Washington and grading their agencies based on what they are reading in social media as a way of driving improved performance and seeing where the problems are.

An agency that may have an A plus one month, may sink to a C minus another month because of some kind of problems in the delivery of services that they can then target and improve.



Open data, big data, small data, sentiment analysis ... then there's open data or open government data, which is another really important arena. This is about opening up the data that government holds. Not typically cutting a flavor or variation on the theme and the reason that open data is important, the reason that it matters when Palo Alto starts to put up since last year, 12,000 different data sets if I recall correctly up on launch or 12 categories of data sets.



Ranging from census data, to citizen survey results, geographic information, finance information, library information, all of the local data online what that does and why it's important is coming back to our original idea. It unlocks the power of collaboration. It unlocks the ability of the citizens, some of them geeky citizens like the people who come to a hackathon, to take that data and scrutinize it, to spot the problems, and to develop new ideas about how to solve it.

As the CIO of Palo Alto says, "I couldn't be prouder of our open data." It's not just talk, its action. This is where it gets real. It's all about giving the community complete unfiltered access to what essentially is theirs and this time he goes on to say, we usually get requests from the media. We usually get those Freedom of Information Act request or demands for our budget and for information about how government is working. Now with open data, we can share that data proactively."



We can make available to people and we can begin the collaboration with citizens of letting data drive to the solution for a real problems. Because again when we talk simply about big data by itself, for many of us the technologies, the processes,

the mechanisms of how we use big data, how we instrument a city and then how we take the streams of data that we're getting and turn into better policy making, can still be very hard.

That can be a very difficult challenge to overcome if we're under resourced. A group like CUSP works only in New York. There's a similar predictive analytics or Urban Informatics Group in Toronto. There's work at the City Lab here at MIT but they're still not widely distributed. We don't fully know how to use these predictive analytic techniques and frankly what's going on is still largely experimental. I said to the director, "What do you do with this data about someone turning on a hair dryer from 10,000 feet and more importantly in New York, there are a lot of people turning on hair dryers. How do you make sense of the noise?" He said we have no idea but we're trying to figure it out!

The techniques are still very much on the cutting edge and under development on the one hand and on the other hand around something like small data, we know that having access to the picture of what I'm eating, what I'm spending, what I'm doing, can be incredibly powerful for changing behavior and improving things like public health and public wellness but we still don't have access to all of that data on the corporate side. We still have a lot of progress to make but we can begin with the data that government collects and the government has by making it more available and accessible, by making it open. We can get the help that we lack with finding the mistakes in that data, visualizing that data, spotting the problems.

Unless you think it's highly technological, I have to digress to tell you about a group in India called MKSS. Don't ask me what it stands for but what they do is they drive around the State of Rajasthan in India, taking budget data from the cities and towns in the state. They go to villages and they paint the budget on the wall in the town square. They have done this in a 10,000 communities and then they sit down in the town square with villagers and they scrutinize the budget to find people who have died who are still on the payroll, bridges that are being built to nowhere and other instances of fraud, waste, and abuse.

It's this extraordinarily low tech collaboration that's actually driving towards delivery of better services and improved accountability in performance in government without a lot of high technology overlay. That's where the hackathon becomes particularly powerful because it's a way to engage with people in a concrete way, in a short time frame, in order to develop real solutions to problems.

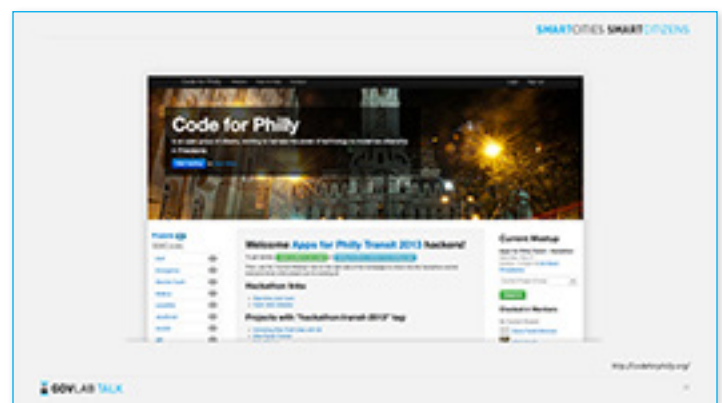
We're seeing real impact as a result whether it's money saved on budgets or in the case of the National Health Service, which started in there now and going big into opening up their data. They're making a big bet around this play. They started a few years ago, starting to put out the data about heart surgery. You could see the different performance across heart surgeons around the UK and over the last 9 years of doing this, there had been 1,000 fewer deaths in heart surgery each year attributed to the release of the data and the changes in behavior among doctors that it actually inspired. The ability to target performance and you're seeing this in healthcare here too. Where when agencies were putting out the data about things like hospital infection rates, we're putting out the data about where the green markets are in our communities, where we're putting out the data about nutrition. We're making these data sets available.

We're actually able to engage people as Philly is doing in creating a community of hackers and developers and designers and catalogers and organizers and others who are working together. In Philly, they have 41 active projects that the city is working on with citizens, using meet ups to get people together on a regular basis to do things like opening up their data to help citizens detect the safest way to travel from your house to your child's school based on crime and traffic and safety data, again solving real problems.

Sometime it requires spending a little bit of money and that investment can be very well worth it.

In Dubuque, the greater Dubuque Development Corporation, the economic council there's put \$30,000 in match by IBM into a project called Smarter Sustainable Dubuque. In which again they are doing projects to do things like locally manufacture smart meters to have every citizen put them onto their homes and through an online portal, citizens can then view their homes water usage data which is updated every 15 minutes.

It allows the city to monitor leaks and to target the fixing of leaks, saving over 50 million gallons of water while increasing revenues by \$180,000 reports of the mayor and at the same time, allowing the citizens to see their own energy usage and potentially bring down that usage as a result of seeing the fact that you are taking longer showers than your neighbor. It's the combination of the power to do things to change government's behavior but also to get citizens to change their own



behavior so that you don't have to do it for them using this collaboration around data.

Some money can be useful. My students and I are playing with a project that they've nicknamed the Community Brigade, which is the idea of -- I think about this as "project management meets Kickstarter" for communities and cities collaborating with each other -- citizens say we have a project where we want to undertake. Here are the tasks. Here are the tasks we need citizens to do and that we need the city to do. Citizens get a small amount of money to do the first phase of a project. If everyone completes the tasks, money is again dispersed to do the second phase.

For example, we the citizens may agree to clean up the park and you, the city manager may agree to put a padlock on the park or to provide the brooms if the project is successfully completed. The second round of grant is then dispersed for the second range of the project. We've been experimenting with both the policy and the technology of which this is a wire frame to create the idea of actually getting cities and citizens working together around concrete projects and to invest small amounts of money to enable them to do so.

How do you do this open data stuff and do it well? We could talk just about that at great length but I think what matters most is how you use it, not just that you publish it. Now learning to get the data up online, putting it up is the first step in the battle but connecting the data back to problems is the war. What are the problems we're trying to solve, what data might we have that we could use to solve those problems, and what data exist at the state level, at the federal level, corporate data, citizen data, what could we combine to help do things like create a more sustainable community?

You can only tackle problems with open gov data when you develop an ecosystem. If you're working with local business, if you are working with citizens, if you were working with the academic community in your backyard, if you're working with those outside of government to come up with ideas for how to actually solve problems. Let me just say, the reason I mentioned this and emphasize it as strongly is for those people who work whether it's in city government or any level of government who don't have enough hours in the day and for whom creating and making data more available and working with data can be an extra task and the data's already too long and too hard.





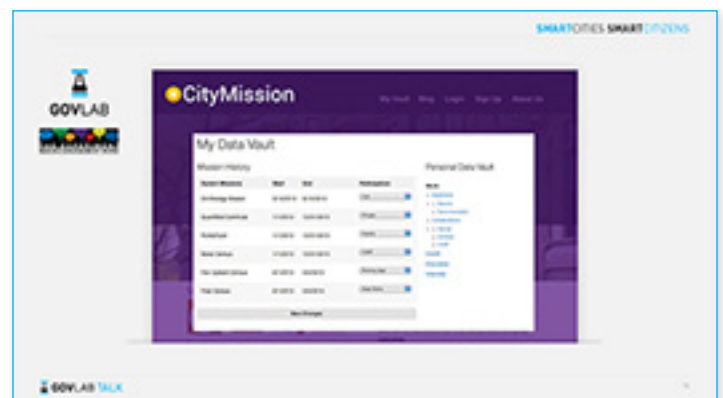
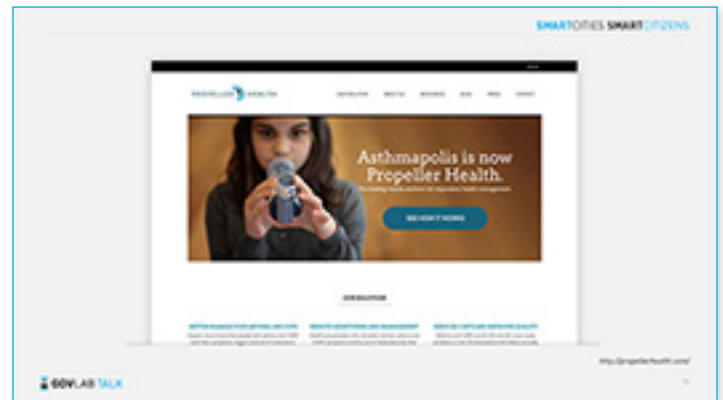
Creating the ecosystem has two benefits. One is it gets leaders the help that they need but more importantly it focuses us on the reason we became public servants in the first place which is to solve problems. When opening data is just about criticizing government and giving people the stick to beat you with, there's not very much incentive for someone in government to want to work on an open data project. When I'm working on an open data project to help the city become greener, become leaner, become better at what it does, then I think there's a real impetus for collaboration.

Above all you have to let people surprise you. The other reason to open up your data is because people will do stuff you just don't expect. When Health and Human services started to put out their public health data sets, there was a doctor in Wisconsin who said, "I'm going to use the existing databases that we have about asthma and then I'm going to stick sensors on people's inhalers and that's going to allow me to contribute back to the public data set, the data not just about who has asthma that we are currently collecting when they show up at the emergency room but where they're using their inhaler."

The project's been going for about three years now. They just renamed it from Asthmapolis to Propeller Health and they have 30 employees. They just got five million dollars in funding. Again this is an open government data project creating real jobs, real growth in a community but more importantly it is saving lives. There's measurable and drastic reduction in the rates of inhaler usage and in asthma incidents among people who are using this kind of self-tracking devices using data and visualization to help see where asthma incidents is occurring, which enables policy makers to make changes and individuals to make changes in their own lives.

You've got to connect people back to problems and you have to call on them to take action.

Another experiment that we have developed is nicknamed City Mission. It is a simple site that some folks developed at a hackathon we ran and it was about getting local citizens involved in the process of gathering data in a community. In this case, the community was Newark, New Jersey and the problem was price gauging in local stores where on the day that food stamps come out and I don't exactly know the rules around this but apparently in New Jersey, the benefits are issued all on the same day. Let's call it the first, on the second all the prices go up in the local bodegas.





Let's send out a brigade of citizens to gather the data about price gouging instances to check the prices in the stores on different days of the month. A specific task, a specific action, engaging people around the problem so that the city can target scarce resources to enforcing this anti-price gauging laws or to identifying in fact that there isn't price gauging occurring at all and then in fact the conditions on the ground are not what we assume them to be. It's about giving us better data gathered by citizens but giving people a task, giving people a mission, making the community your partner in what is ultimately about doing experiments.

I think to undertake the work that I'm talking about, you have to embrace it with a degree of humor and a degree of whatever it takes to recognize that these are things you have to try. You have to try and see what works. We don't have well-established practices. You know we have a hackathon and not as many people come as we'd hoped. We give people a challenge and they don't all turn up. We put out some data and to our great surprise everybody turns up around the data set we thought nobody would be interested in and suddenly they're making apps and businesses.

It can often surprise us in one way or the other and I think it's very important that we embrace the sense of experimentalism and embrace it with a sense of humility and adventure that we are trying to do things in new ways to bring innovation to change that 18th and 19th century model in which citizens are here and government is here and to bring them instead closer together.

People will participate even though you think that they may not. They do it for reasons of community, they do it for reasons of belonging, they do it to get professional status. I can't tell you how many resumes I see of people who put their Wikipedia entries on their resume. That will surprise you. People who put their Klout score or their profile from Stack Exchange or on some other site, they do it sometimes to earn money because they want to get the prize and most of all though people do it because they want to do stuff that matters.

Most people -- unlike the people in this room who get to do public service -- do not get to have the satisfaction of doing well by doing good and they are eager for the chance to participate.



For you, it makes a lot of sense for all the reasons that I have enumerated. It can help you to spot problems. It can help you to gather the data that you need to make better decisions and it helps you to go beyond the usual suspects and get help from people you wouldn't otherwise expect.

One way to do this is to hold not a hackathon but an “ideathon” and I think that's what happened here yesterday.

You don't just need to code things and make apps. In fact, there are lots of apps already out there. What you need sometimes is to get people to work with you in thinking through a problem. I was at a hackathon the other day and I was a judge and the first prize went to somebody who was working on the problem of trash delivery. That was his passion: trash. He came out after the weekend-long hackathon and everyone else was showing their apps and he came and he showed a Google Doc.

He said, “Well, you know what I decided to do was instead of trying to make you another app, was I took my problem and I worked with my team on coming up with 57 different ways we could tackle this problem.” He got first prize.

Sometimes you have to support open innovation with legislation. You need an open data law; you need the policies that help to mandate the use of collaboration. If you need to do it then that is one route that has to be undertaken if it's necessary to get you there.

We had to do it the federal level by creating an open data policy, it's been reinforced again by open data and open government policies, the world over, there's 60 countries who have signed on to the open government partnership and the pledge of openness. Do whatever it takes to help create the culture of open.

Finally let me say that this culture of open, it may be foisted upon you, it may show up in your backyard in the form of Sky Truth that wants to study fracking in your neighborhood or the folks from the DIY science collectives who are measuring their air or water quality, whether or not you've asked them to do so.

When it happens, embrace it, it's a great way to solve problems and to move forward and to move us away from the adversarial context of citizens versus government.



People can help us to do more than just inform how we decide.

Increasingly what we're seeing is things like participatory budgeting, in use now in 1,500 communities in the US, probably in many of your towns as well, to hand citizens the purse strings, to hand them the power of government, to involve them in the decision making about how money gets spent.

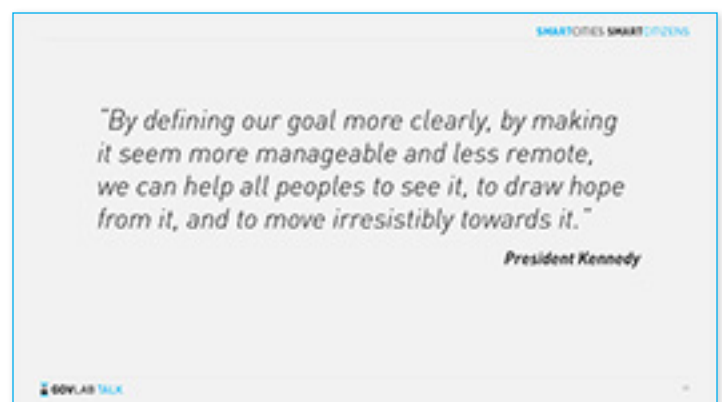
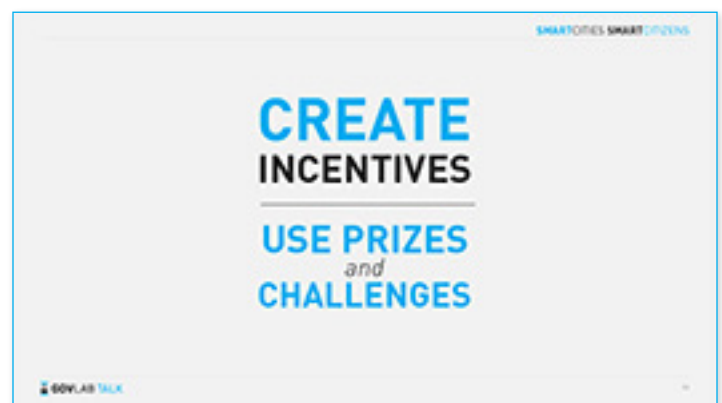
Participatory budgeting brings with it, many more diverse players to the table who wouldn't otherwise participate in the decisions, thereby making the decisions more legitimate and easier to implement but it also helps decide real money, to decrease fraud and abuse and in many communities to bring the community together in a shared process of public service and public engagement.



Prizes may be one route to go, we've mentioned them a few times before, they don't have to be big, sometimes they help to create, not only of the financial incentive but the sense of competition that really drives people, gets them out of bed on a Sunday morning. The same thing that gets us to play video games, the challenge as President Kennedy described when he talked about what was the paradigmatic grand challenge namely the Moon Shot.

The race to the moon that drove so many of us for a generation and got us not only to work specifically on that problem but on improving science and technology education in this country over a generation.

Why? Because of our desire to beat those Russians, that's what got us out of bed. Don't underestimate the power of competition to actually drive.



Finally, crowdsource wisely not widely. This is the problem with these petition sites. It's generally felt that engagement is only successful if I reach a million people. I've got to have a huge number of people participating for it to work. If I get six people who turn up and they do really good, quality work and it solves the problem then it works.

Think about the fact that people have very specific kinds of knowledge. In the book that was mentioned earlier, I wrote about an experiment that I worked on called Peer to Patent where what we did was crowdsource ideas for how to increase the quality of patent applications by getting help from scientists and technologists outside of the patent office.

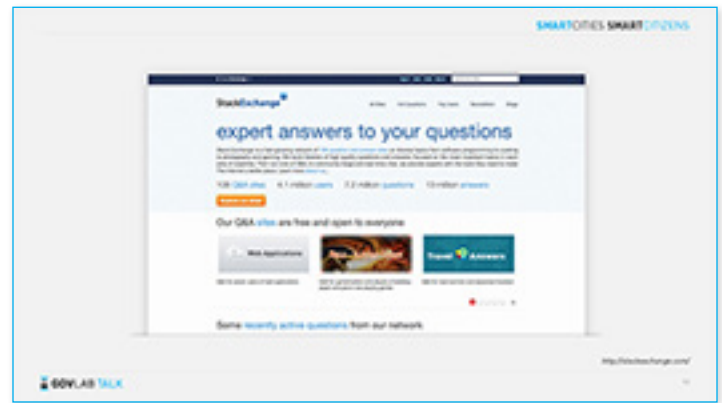
We didn't have millions of people looking at a patent application, we were lucky to get 10 or 15, on a good day we got 30 or 40 and sometimes we got three.

If it's those three people who know about that specific technology and can help the patent examiner get the information he or she needs to overcome the fact that they have very few hours in the day, then it actually works.





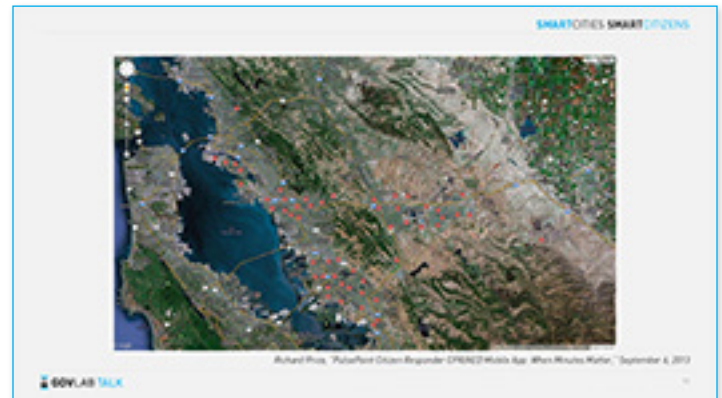
We handed off the project to a group called Stack Exchange, this is a freely available website that has communities of people who are there to ask and answer questions. Anyone can create their own stack on gardening on photography, on patents, whatever it may be to help get answers to problems from a solver community.



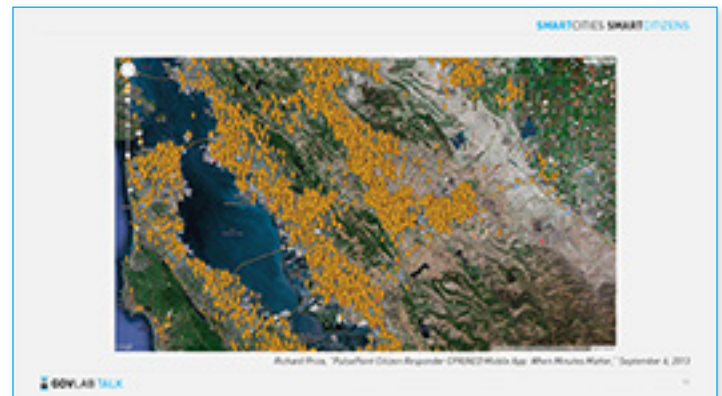
The important thing about Peer to Patent, about Stack Exchange and about PulsePoint which is the story I want to bring to you at the end is that it's not about targeting everybody. It's about targeting people with specific skills and abilities. In the case of PulsePoint (this used to be called the fire department app) this is about targeting those people who have, who are CPR trained. When a 911 call comes in that someone's suffering cardiac arrest and I'm nearby, an alert goes out like a text message on your phone to tell you to race to the side of that person.



In California, this is the penetration of first responders. These are the fire departments. When you add in the first responders available, when you count the PulsePoint network of registered CPR users this becomes the penetration of first responder ability (see slides showing dramatic increase).



It's not about crowdsourcing widely. I don't want just anybody coming to my side to use the defibrillator and administer CPR and do those things that by the minute increase the likelihood of survival by 50%. I want people who have CPR training.





This is a site called VIVO that has profiles of people.

You all know LinkedIn, which tells you about people's expertise and ability.

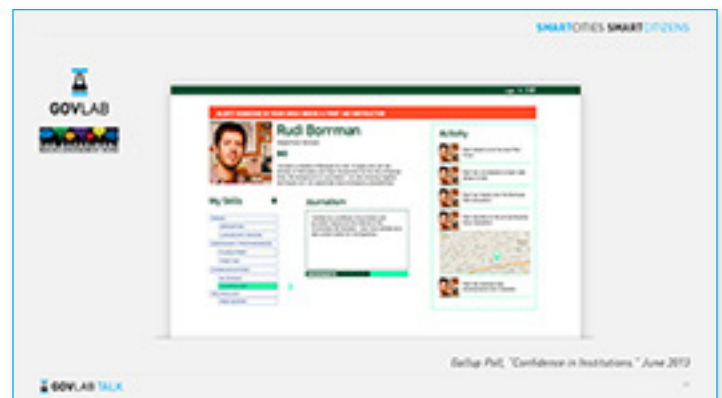
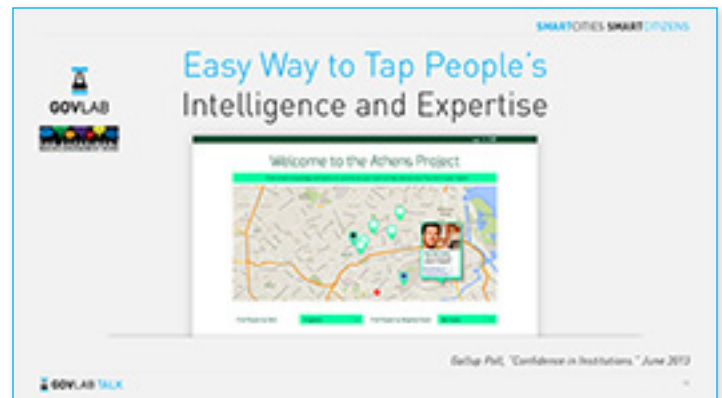


You may or may not know about GitHub, which is a really great way to see, to find developers and to see who's doing what kind of technical activity and you wanted an easy way to tap people's intelligence and expertise.



Like Rudi Bormann in Buenos Aires -- another project we're working on -- who wants to develop this kind of Facebook of skills for government.

It can be very highly quantitative and algorithmic like LinkedIn does to really figure out all the things that people know based on all kinds of big data algorithms but I can also just have a form that I hand out at the local school, that I hand out at the supermarket to ask people what are the skills and passions and interests that you can bring to government, that you can bring to solving problems and challenges together.

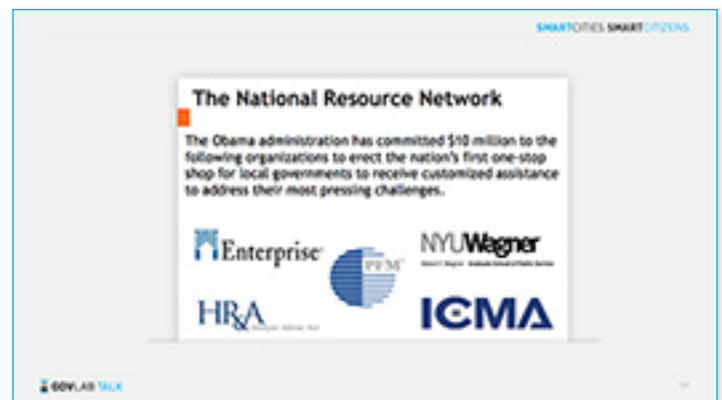
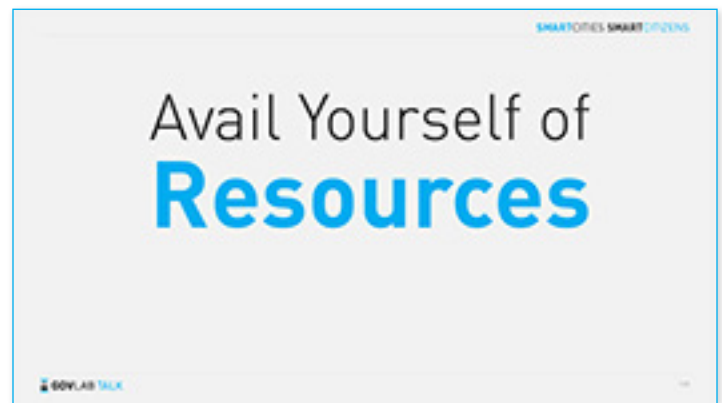


There are lots of resources available out there to help you do these things.

You all heard talk yesterday I think about the National Research Network and you'll hear more about it today. It's trying to bring advice and expertise to people to do this.

There is a Personal Democracy Forum, folks who run conferences on innovations in government.

Code for America has not just the fellows that they send into cities but they have a brigade of people who work together to form chapters that can help local governments.

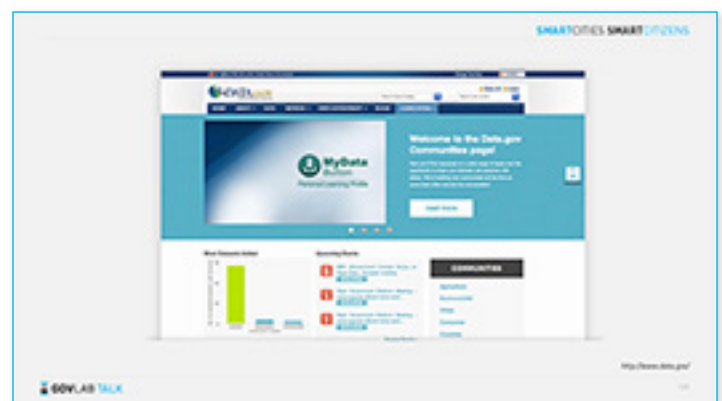


The Civic Commons is an app store for innovations for local government.

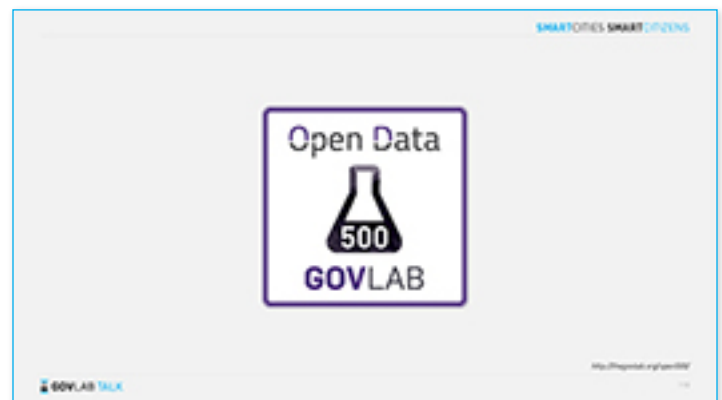
Sunlight Foundation just got two million dollars from Google to work with local governments.

The Omidyar Network is a major foundation based in California that spends most of its money on government innovation now.

There's Data.gov which has data from the state, federal and local level, if you don't know where to find it on data.gov, you can go to the RPI University website which has a catalog of all the data sets from the entire globe, all available online.



The GovLab is here to help you with our Research Digest that we make available as well as the other projects that we do, including our Living Labs where we're working with communities and governments on building new technologies to help bring innovation into the way that we decide.



We've talked about a whole range of strategies using data but above all using people, smart citizens with big data, with small data, with open data.

You can do it. You have to be experimental. You have to innovate. You have to try. You have to try again.

When we embrace the concept and the value that we can't do it alone, that the smartest people are those who don't work in government but who may work for somebody else. When we recognize the joy that comes from collaboration -- that many hands make light work -- then I think we begin to embrace the future of not only a data driven government but of a 21st century stronger democracy. Thank you.

