After the Fact | Event Rebroadcast: The New Age of Invention
Originally aired Oct. 13, 2017

Total runtime: 00:47:01

TRANSCRIPT

Dan LeDuc: For The Pew Charitable Trusts, I'm Dan LeDuc and this is "After the Fact." In this podcast, we explore the numbers shaping our world today. Last summer, we had a chance to hear from Brian David Johnson. He was an author who was featured in a recent Pew publication called *Trend*. It looked at knowledge and invention in the digital age. Not long ago, Pew sponsored an event at the Chemical Heritage Foundation in Philadelphia, where we brought together some of our other writers who could talk about knowledge and how it can be put to purpose for the public good. That conversation was moderated by Frazierita Klasen, who directs Pew's work in Philadelphia. And here she is.

Frazierita Klasen: Before we begin, I'd like to take a moment to thank the Chemical Heritage Foundation and its president and CEO, Robert Anderson, who is here tonight, and I'm delighted that you are here. We're happy that you are hosting us this evening in this wonderful space. I'd also like to point out our evening's hashtag—and I actually do know what a hashtag is—on Twitter. And that is #PewTrend for those of you who want to engage with us on that medium. And please note that we are recording this session for our podcast, which is called "After the Fact." And we will share this conversation with our broader podcast audience in the near future.

So let me start tonight's discussion by introducing our panel. I want to first introduce Sue Urahn, the executive vice president and chief program officer at The Pew Charitable Trusts. Sue oversees all of Pew's programmatic work, including research, technical assistance, and advocacy campaigns in the United States and abroad. As chief program officer, she manages a diverse mix of projects, including health, state, consumer, and environmental policy initiatives; efforts to advance biomedical and environmental research; and our work in Philadelphia. So she's my boss.

Sue joined Pew in 1994, and during her tenure, she has led important pieces of Pew's research in the public policy portfolio, including projects in pre-K education, fiscal and economic policy, and biomedical research. Sue has created and led Pew's important state-based work for almost 20 years.

Next is Lee Rainie, who directs research on the internet and technology at the Pew Research Center. Under his leadership, the center has issued more than 650 reports based on its surveys that examine people's online activities and the internet's role in their lives. Lee is a co-author of *Networked: The New Social Operating System* and five books about the future of the internet that are drawn from the center's research.

And finally, let me welcome Jody Roberts, who directs the Chemical Heritage Foundation's Institute for Research. Jody leads research that is at the core of the organization's mission to foster dialogue on science and technology in society. He oversees CHF centers for oral history and applied history and ensures that research at CHF supports the institution's unique ability to speak through museum exhibitions, live print and digital programming, and its unparalleled collections in the history of science. Thank you, Jody, and all of our panelists for joining us tonight to share your thoughts and expertise.

So a little bit about tonight's format. I'm going to pose a series of questions to our panelists to elicit their insights on the important issues that are covered in *Trend* magazine. Following that, there will be an opportunity for additional questions. We are looking forward to a lively discussion, so thank you all.

And I was supposed to remember to carry this in my hand. So that was my first mistake. Sorry about that, everybody.

Sue, I want to start with you. Your essay in *Trend* magazine asked if public policy can be inventive. As the chief program officer for Pew, what have you seen that makes you want to answer that question yes, and can you please describe trends you are seeing that indicate that public policy is inventive?

Sue Urahn: Sure. Well, first of all, let me also thank everybody for coming. It is great to see so many familiar faces. I am in DC, based in DC now, but I spent many years in Philadelphia, and it's great to be back. Public policy has—yes. The answer to that is yes. It's kind of a rhetorical question, I think. And public policy has always been inventive. I mean, there are endless examples. You can go back to the Morrill Act in the 1800s that created the land-grant universities. You can look at the GI Bill. You can look at charter schools, which some of the legislation was drafted actually when I was working in the Legislature in Minnesota.

Whether you agree or disagree with any of those pieces of legislation, they were quite innovative in terms of dealing with social problems that they had at the time. I think what you can also think about in terms of public policy is, what are the conditions under which inventive, innovative public policy arises? I think that when you pose it like that, you have to look for a place where government is really thinking very hard about the role that it should play in

addressing some particular issue of the day, where there is an openness to thinking about new approaches or new ways of dealing with problems.

A government that is open to assessing the impact of whether things are working or not, and actually thinking about the results of that impact. An openness to tweaking policy as you go, because policies are never right the first time. So innovation is also iteration, and I think that's a really important part. So where have I seen it really play out? One of the things I point to is our sentencing and corrections work that we've been doing for well over a decade now.

It's emblematic of one particular piece I think that today, in particular, public policy is struggling with on the innovation side, and that's data and analysis and the sort of emerging flow of data that government is struggling with. And there was actually an article in *The New York Times* today on Louisiana, and a very significant sentencing and corrections overhaul that happened there. It happened to be one that Pew was privileged to work with the state Legislature and the government on, and I just want to read a very small piece from that.

It says, "Louisiana is following a growing number of states in applying an empirical, data-based approach. A politically diverse coalition of Louisianans understood that their state would see the benefits of reduced prison populations and increased public safety. And in the end their support made the reforms' passage possible."

So I think you're seeing a lot of innovative policy over the last 10 years in sentencing and corrections. It's come from the states. I think it was Justice Brandeis who said states can serve a very important role as the—what was it? Now I'm forgetting. Laboratories of democracy, right. In 1932. That's something that we're seeing today, and I think that's a lot of where some of the more innovative policies are springing from.

Frazierita Klasen: No, that's great. It's exciting too. Thank you, Sue. Lee, let me talk a little bit about your essay, which raises important questions about how technology, the networking effect, algorithms, and the internet of things will change our lives. I know you've spoken to a lot of tech leaders who are on the very edge of innovation today. What strikes you about the future that we're facing, and how we need to be prepared for that future?

Lee Rainie: Well, again, thank you for hosting us at this wonderful facility, and thank you for the Pew folks creating this magazine. It's a stretch for them that is really paying off. They're thinking in new ways about how to engage their stakeholders, thinking about trends, which is fascinating. And it's good for me, because I get to write pieces like this.

And I've been the luckiest social scientist in the history of social science, because I began working with a Pew grant in the year 2000 looking at the social impact of the internet. And

there've been three revolutions already on my watch. Most social scientists are lucky if one thing maybe happened in the distant past that they are interested in. I've had three to observe, and the fourth is already underway.

So the three are the rise of the internet and broadband itself. Completely changed the way that people communicate with each other and access information. The second was the mobile revolution. So in effect, data information communication possibilities became a body part. I think the last thing that people won't forget as they leave their homes is their cellphone, because it's their brain, it's their engagement book, it's their memory, and all things in between. So that's a second revolution.

The third thing is the social media revolution, which turned everybody into a broadcaster and a publisher. And all of a sudden all of these new voices, and all of these new insights, and all of these new crazinesses came into the world, and it's fun to study those crazinesses.

And the fourth one now is underway. The internet of things. How many people here have apps that remotely control something that is distant from them? A TV or house? About a third. How many people have Fitbit or other health monitoring devices on their bodies? How many people have smart appliances in their home like a thermostat, and things like that?

How many people are tweeting, by the way? You got to do this, and don't twackle, though. Twackling is heckling a speaker on Twitter. So don't do that, but if you use #PewTrend, say really nice things about all the fabulous things we're saying. And the thing about the internet of things is it's generating just unimaginable amounts of data. Data about us. Data about our tools. Data about our environment. Data about our economic supply chains, and things like that. And I spoke in the piece about the rise of a data chasm.

Sue talked about the rise of open data. A really exciting, really kind of troubling development that the policymakers are going to have to deal with. But data are going to be infused in everything. I'm sure there are exhibits here at this museum, and there certainly will be in the future, that tell you that you will access all sorts of historic facts, all sorts of other commentary on the artifacts you're seeing here, invite you to comment and tell your own stories about these things. And all of that is data that's generated for the purpose of getting more insight into you so your tools can perform better for you, and the corporations that collect the data might know more about you.

So the data chasm is a real thing that will essentially fuse data into almost every aspect of life. Related to that is how we will become more and more dependent on algorithms. It's just too much for humans to process, and it's too exciting to have all this data and not have it analyzed. So there are ways that we are going to manipulate data, and depend on those manipulations to

help us get from point A to point B. To help us cure the diseases that we have. To help us be better farmers.

One of the fabulous pieces in this issue is about particularized personalized farming that is now enabled by all of the infusion of data into environmental circumstances. But there's a scary part to algorithms, right? They're written by human beings, and human beings have foibles and biases and problems, and don't necessarily understand the consequences of what they're doing all the time. So there's that.

The third thing I wrote about was our new relationship with machines and complementary intelligence that is generated by these algorithms. Most dramatically, that's going to show up in all of the public policy debates that will take place around the future of work. Lots of human activities that are built around for pay are going to be taken over by robotics and artificial intelligence and other kinds of automation. We're probably going to talk about that a little bit later on.

But the fact of the matter is, everyone in this room who still has a job or aspires to a job is going to have to change as a result of that. There might be ways that you will benefit from it. That you'll be able to add more value to your job, because you won't have to do the drudge kind of work that the tools can do for you. But there are also ways that it will take over things that you thought you were applying intelligence to, and so you're going to have to step up your game to live in the newer relationship with machines.

And the fourth thing I talked about is really very tied to Sue's domain, which is that as a result of all of this change, we're going to have to invent new norms about how we get along with each other. Think how annoyed we all are now when people are staring at their cellphones instead of looking at us when they're talking to us, or sitting at the table next door. Well, multiply that by about 1,000, and we're going to have to figure out new ways to be in presence with each other as well as to access all this wonderful stuff.

We're going to need new laws. This is challenging fundamental aspects of people's privacy, about their autonomy, about their agency as human beings. Who gets to decide what's going to happen in that driverless car that you're going to drive in? You or the machine? And stuff like that. So lots of social innovation is in our future. And that's what kind of makes it exciting to be a researcher in this area.

Frazierita Klasen: That's great. I did think while you were speaking, that if Frank Baum—I think that's his name—wrote “The Wizard of Oz” today, he’d have to recast the character who only wanted a brain, right? Because he or she could just have taken a smartphone out.

Lee Rainie: That's exactly right, and we're going to get one of those brains one of these days with the singularity. But that's another point.

Frazierita Klasen: Jody, as a representative of our host this evening, the fabulous Chemical Heritage Foundation, I'm wondering if you can put all of this into context. Sort of give us the historical context for this period of invention and innovation.

Jody Roberts: A super easy task, and I will tweet my response to you.

Lee Rainie: Bless you.

Jody Roberts: So let me also add my reverse thanks. This has been wonderful to have an opportunity to host this event. I'm deeply appreciative of the kinds of conversations that all of you are trying to instigate with the magazine, and with the work that's represented inside of that magazine. I think one of the things that's really most amazing about the articles and the essays inside of that magazine is that we are often confronted with some of the topics that all of you have just discussed.

And some of the other pieces that are in there, from "The future is going to be fabulous" kind of perspective, rather than a "Let's stop and think about this." It could be fabulous, but we need to make it fabulous. And that's a different kind of conversation than just waiting for it to happen. So I think it's deeply important for that reason. So I think there's probably two ways at least to answer the question, starting to think about historical context.

One is to think about where we're situated right here in this particular location in Old City Philadelphia, and we are equidistant from where the Declaration of Independence is being drafted, and where our country and democracy is being imagined and written out, and where Benjamin Franklin had his home, right behind this institution. And I think there's an interesting hypothesis there that wouldn't take too much to argue that the relationship between democracy and invention is something that is unique about the democratic experience, and the ways in which we think about government and governance inside of our country over the long history of it.

And so I think there's a deep interest and passion for thinking about the ways in which there will be a belief in the social good and the social nature of invention and technological progress in scientific knowledge-making, long before we had terms like science, when the country was being formed. But nonetheless, there has been a need for rethinking over the course of 200 years what the relationship looks like, and what is the right way in which that relationship needs to be fostered, the ways in which it needs to be funded, the ways in which it needs to be reined in?

And so there's something special about what's happening now. I think part of the democracy and invention linkage here in the United States is also thinking about the ways in which we have a very prominent narrative of technological progress that guides us. We really do believe that things are going to continue to get better, and that is not just a social statement or a statement about economics. It is also a statement about a belief that technology is going to help make that possible.

And I think one of the things that's really interesting to me right now is that we are in a place where, despite the fact that by scale and scope, things really do seem to be moving much faster. So I think—I don't want us to negate things like rural electrification as a pretty phenomenal change to the basic infrastructure of the United States, or thinking about the interstate system as a piece of that. And thinking about other ways in which we really have experienced pretty dramatic technological change in this country.

But what seems unique about this moment is not just that scale and scope piece, but the fact that we are trying to have a deliberative process about this. And I think we can look at very recent evidence of this. Looking at the ways in which we handled or didn't handle the first iteration of genetic modification, and the ways in which we did or did not have the appropriate kind of public dialogues about that.

The ways in which, when the national nanotechnology initiative was rolled out in the early part of this century, there was an explicit—and we could argue about whether or not it was well done—but an explicit effort to start thinking about those larger social, legal, ethical implications alongside the development of the science and technology. That this is something that needed to be done in real time and in parallel with those sorts of investments.

And again, that provided a really interesting kind of 10-year experimental basis for wondering what kinds of policy innovations might need to take place to start to encourage the kinds of public dialogues that would be necessary. Not for quick uptake of the technology, but for starting to question what kinds of technologies we need in the first place. And again, we could talk about whether or not that that's actually been successful.

But I think what you're seeing now is, as we are getting into this discussion of data, as we are starting to run the corner on other emerging technologies, whether they're synthetic biology, whether we're talking about human enhancement, that there is a more acceptable place for having a public dialogue and public conversation about those. And we're also changing who gets to participate in those, and that has also been one of the dramatic changes over the last couple of decades.

And I think it's an exciting opportunity to be at a place like CHF at this moment, because we are trying to think about the ways in which humanistic approaches. So how can the humanities and social sciences help to instigate the right kinds of conversations rather than simply be reactive or documenting a process as it's happening? In broad strokes, I think those are some of the things that I see happening that are maybe a little bit unique to what's happening now.

Frazierita Klasen: That's really very, very helpful. I want to come back and probe some of that. About sort of how we get—sort of how some of these processes and products lead to social good, and those conversations about humanities and social science, and how they can help inform all of that. I want to come back and probe that a little bit more with you.

I want to talk a little bit more now about the sort of challenges and opportunities that we face, given this sort of new age—this modern age of invention. And, Lee, if I could start with you, and the comment you made earlier about the implications for the future of the workforce, and what that means, and what that looks like, and whether our education and training systems can keep up with these developments.

Lee Rainie: That's the big question. So there are some reputable econometric work that suggests that half or more of the current jobs in America will be jeopardized by artificial intelligence, robotics, and the spread of them in the next 10 to 15 years. So this renegotiation of our relationship with machines is inevitable, and it's going to be pretty awkward in workplaces around the country. And one of the things that these experts that we talk to worry about is, what does it do to inequality? And that's so germane to the discussion about the future of democracy.

And so there are ways in which this makes us more efficient, makes us safer, makes us less tied to drudge jobs or boring jobs or dangerous jobs, and things like that. So there's an upside to all of this change in workplaces. But there are ways now that the current arrangements just won't work very well for people. And when we do surveys on this, the people who are most acutely aware that they're in jeopardy are the people with the best levels of education.

So the people who are most in line to be harmed, and whose jobs are most directly immediately in jeopardy, don't have this sense that their jobs are on the line. Actually there's a very wonderful polling phenomenon that plays out across this. They think they're fine. They think the rest of the culture is hosed. So they don't personalize this at all. They understand that this spread of technology is going to affect things.

And then the question becomes, well, can we upscale people and retrain people for the new jobs that are coming? And there's some substantial hope that by moving some courses to online, by moving towards micro-credentialing rather than sort of saying, you have to have this

capstone degree from a capstone program as the single marker of your skills and competencies. But there are ways in which you can prove that you've mastered something in a much more efficient, much more rapid way, and maybe get certified for your next line of work.

So there are a whole host of ways that we'll probably be adjusting to this. But there's a fundamental question here whether capitalism generates enough jobs to keep the populace happy. And particularly in America when we do surveys on this, it's so clear that the vast majority of working Americans tie a central part of their own personal identity to their job. So the fact that it might be at risk or the fact that someone might take it away from them is not something that they treat with relish. It's something that is deeply wounding to the actual person that they are.

Frazierita Klasen: As somebody who spent a good part of their career in workforce development, thinking about workforce development issues, this is a whole new territory. And sort of whether our existing workforce development systems really need to be rethought and reframed, and whether public policy is ready to do that, is a good question.

Lee Rainie: One of the wonderful pieces in this magazine is by a thinker on this named Alec Ross, and a really nice point that he makes that also shows up in some of our data, when you talk to people about this, one of the most interesting spots that they eventually end up in is a very existential pondering of what it is to be human. What are the special, unique, wonderful things that humans do that machines can never do?

And it's in a way, if you think about it, it's kindergarten stuff. It's emotional intelligence. It's pattern recognition. It's being able to get along with people. It's being able to communicate. It's not mastering code, although there's some virtue to be thinking about that. But it's a really interesting dimension to this conversation that as machines encroach on many of the things that humans are decent at, including emotional algorithms.

There are good algorithms that can look at a face and say, that's an unhappy person. And they're actually developed to sort of say, we understand you're unhappy. How about doing a little meditation now? And so there are just a lot of interesting different things cascading through human nature that's part of this conversation.

Frazierita Klasen: I think I have all of those apps on my cellphone. So, Jody, I want to come back to the prior conversation that we had about sort of the processes we've been putting in place to sort of get us to the conclusion that these products and processes will lead to social good. Can you elaborate on your thinking?

Jody Roberts: Sure. Unfortunately, every time someone speaks, there's a couple of other avenues that would be great to explore. I think with respect to that, I think what we're looking for is as we become—so if we accept what Lee has discussed and what shows up in a lot of those different essays that we will be awash in data, and we will be trying to use and mobilize that data in more ways. It's really increasing the emphasis on, did we ask the right questions to get the data, and are we using the right data?

So for us I think it's kind of from the social science perspective, stepping back and saying, what's the question we need to be asking before we get to the point where we start doing the data generation to then mobilize it? And I think that's where you start to see some of the experimentations. I think it's also a place where there's been a lot of degradation over the last couple of decades.

So in the place of, say, the Office of Technology Assessment, which goes away in the 1990s, where there was an official mechanism by the U.S. government to think about how to evaluate and look for the applicability or acceptance of certain kinds of technologies. When that was taken away by Congress, nothing really jumped up in its place. And yet there have been some social innovations then outside of government that have attempted to bridge that.

And so you have an article by one of the faculty down at Arizona State University, and that's obviously been a place that through that national nanotechnology initiative, did begin to experiment with what a lot of those opportunities could be. And some of that is public dialogue. Some of that is just trying to find opportunities like this where you can share. Some of it is expert panels. So remaking, refashioning the citizens' panels that have been very popular in certain northern European countries. Very resource intensive. Very time intensive, but you get some really wonderful opinions, right?

So the average person walking down the street is not dumb and does not need to be educated about what science is and what technology is. What they need is a vehicle and an opportunity for participating in the conversation in the first place. The challenge again is that that's a very long deliberative process, and we don't tend to like long deliberative processes.

The other element, I think, picking up on a comment that Sue made at the beginning, we have—so you have this wonderful comment, "Policies are never right the first time." And yet we kind of expect that they will be. And we kind of expect that especially on the social policy side of it in evaluating the technology, that we're going to get that right the first time. And if we don't, then it was a total waste of our time. Rather than thinking about the ways in which that needs to be re-engineered.

So I think these experiments in bringing in public voice have been interesting experiments. I haven't seen a way in which they're being mobilized to actually start influencing the ways in which technology is developing. And that's probably the chasm that needs to be crossed.

Frazierita Klasen: That's really helpful. Sue, can you talk more about how policymakers are using technology, and engaging citizens around these issues?

Sue Urahn: I can, but I want to come back first. I'm going to go down one of these points. And I have to laugh here, because while we are all sitting here talking about technology, my watch is telling me I should get up and walk around for a minute, because I've been sitting too long. You mentioned the challenges that technology poses. And in the policy sector, the challenges are really quite significant as technology moves. And, Jody, you mentioned speed. So that's kind of the first challenge I really see when it comes to policy.

I remember 20 years ago when I was first working with legislatures to help them figure out how to do good policy. What we worried about was whether or not they had access to good research. Research does not move at a blinding pace, right? So you had time to go out and look, and it didn't change really rapidly. And they didn't have the capacity then, really. Governments didn't have much capacity then to even use the research. So there was a certain pace to policy development, and it was kind of under control.

What you've got now is data and technology and changes coming so fast that government has absolutely—it is literally like being at a firehose. They have to look at data, how to connect data with the privacy issues. They have to look at how to analyze that data. Think about predictive analytics. Governments are leaping into the predictive analytics space with very little ability to figure out how to do that. And people are selling them predictive analytics to use in making very consequential decisions, and they may not know what's—to your point—the algorithm. What's underlying that. It's an enormously complicated thing that's moving at a lot of speed.

The capacity to deal with it is very limited. Government doesn't have the people. They don't have the expertise, and they can't afford to bring it in, as a general rule, to figure out how to even do that. And then overlay on that the expectations that the public has. Because the public is firmly convinced that since they can pick up their cellphone and get pretty much anything in two minutes, why should government not work the same way.

Some years ago, we developed a project working with the states to help them figure out how to make their voting rolls more accurate by relatively simply just comparing a whole lot of data sources to figure out if Joe Smith who lived over here and Joe Smith who lived over here were the same person. And if so, what did they do about that?

What was really kind of interesting about this, it took us several years to get this technology put together to get the states to bring it. And we asked some of the secretaries of state if there were challenges in moving this technology. And they all looked at us and they said, "To be honest with you, the public thinks we do this already. So we really have to kind of figure out how to get it in place and move it ahead."

And that's true across the board. The public expectations for what government should be doing and how it should be using technology are light years beyond where the government is. And there's not a very easy path that I can see for how to get them from where they are today to where they need to be in a thoughtful way.

Frazierita Klasen: Well, it's striking to me that it's also—it's all happening at a time where there's pressure on government to be lean and mean. So there's pressure on the sort of public sector and state bureaucracies to downsize, right? And so how they cope with more sophisticated data and technology alongside the pressure to be lean and mean and more efficient, and to sort of eliminate whole departments or thousands of jobs is—

Sue Urahn: It's a little bit of a vicious circle, right? Because technology can help you become more efficient, but in order to figure out how to use the technology in a proper way, you need the capacity to do that. So it becomes a little bit circular.

Jody Roberts: But I think there's something to that—if I can just add quickly. I think one of the things that really struck me in reading through the magazine, and reflecting on some of these comments, is that there's a lot of investment, very purposeful investment, in that technological innovation space. And yet this clear understanding that the social innovation, the social policy, isn't keeping up. But not a lot of then comparative work being done to also then invest in that social policy. And so, some of that is happening at the state level. Some of that is happening within the local governments, and they're also being trimmed down.

There is both a labor issue in terms of who's going to do this, but also are we undermining our ability to facilitate that process of the social innovation to keep up with some of this? So are we either rethinking where that place needs to be, where the social innovation needs to happen, or we need to rethink who's investing in it in the first place. Or we need to be arguing that these places that appear like they're just full of bureaucrats are actually places where experimentation is happening. And by doing this, it's the equivalent of gutting a government lab.

Lee Rainie: There is innovation happening, and it's usually subversive. Because the bureaucratic structures of government agencies are emerged from the industrial era. That was the most

efficient way to gather up lots of information and expertise, sort it out, and make sense of it. That's not the model now. It's networked, platform-based, rapid iteration.

There is a new phenomenon in the business world called flash companies that come together—there was a piece about it in *The Wall Street Journal* last week—that come together, assembling a batch of expertise. It's kind of like a movie, but it's a much faster time frame. You iterate, you get a designer, you get a prototype or you get market testing and stuff like that, and it goes away in weeks, maybe months at most. And that's the world that we're living in. And government bureaucracies are all structured around who's on the org chart making decisions, and how do they flow up and down the system. And so it's hard for them to do. It's exactly the way you described.

Sue Urahn: It's enormously complicated. And you think about something as simple as data, right? And it is. It gets back to what—I don't remember who was saying it—but it's like the things that you learned in kindergarten. It's like who owns this data, right? So you go into a state, and they will say, "Well, this is my data, and this is Joe's data." And those things don't talk to each other, but that's okay. And I don't actually want you to look at my data, because you might find something wrong with my data. And if there are errors in my data, and I can guarantee you there are errors in the data because there always are, then there may be a problem and that will come back to me.

So that's where you're starting. Then you can overlay the legal counsel, who varies in every single state and jurisdiction, and they will have their own way of looking at it, and they will decide whether or not it's a good idea to share that data. Some will say yes, some will say no, and they don't really care what anybody else said. So you have to kind of one place at a time start to negotiate every little piece. And this is happening in the context of a private sector that's moving like the speed of light to move these things.

Lee Rainie: The Obama administration placed great stock in an open data initiative. They were the first to name it. They were first, too, in trying it. There were orders. There was an executive order that went out to every agency and said, share your data. And you have to do it, and here are some timelines for it. And so at least in the first wave of data sharing, the first two years, about two-thirds of the data that were shared in public data sets were in PDFs. So you couldn't work with that data at all.

Sue Urahn: Oh, that's a huge problem.

Lee Rainie: And so maybe the subversive is the guy who releases machine-readable data and risks getting fired by their boss for making it usable for the community of activists who want to use it.

Frazierita Klasen: Thank you. I want to sort of take it down to the local level a little bit. So we're in Philadelphia, and I want to talk about—see if I can get your insights on sort of how—what some of these issues mean at the local community level. And, Lee, I think you have a lot to say about this question. About regarding the networking effect of social media, and whether it's making people closer or making them feel more lonely.

Lee Rainie: Yes.

Frazierita Klasen: Thank you.

Lee Rainie: So community is being really interestingly changed as a word and as a concept. The whole idea of what's a friend now is different from the way it was pre-social media. The whole idea of what's an acquaintance is different. The very idea that you can ping several hundred people who have deigned to follow you or friend you or something like that. We've never managed this amount of social data and social interaction in human history before. And so, of course, it's going to be all messed up.

But the best thing to say, probably the most accurate thing to say, and can't be proved with Pew data but it just makes sense is, the internet makes people more of what they already are. So if you're lonely and miserable, and maybe an introvert and stuff like that, this doesn't help. Because all you do is see more people who are happy and extroverted and living way better lives than yours. If you're an extrovert, this is like the biggest playpen in the history of the human species, right?

And there are these super users of social media who do more than anybody. They friend more people. They like more things. They post more comments. They are now part of more groups. That's a big digital divide, in some respects, that's driven by people's personality traits. So there's more connectivity, which probably is for the good. You get more sharing. You get more insight. You can invite people into your community. I mean all of us, really, when we're building something are in the community building business, especially if you're in a museum.

And yet there are ways now that this pushes to the margin people who don't have the emotional or psychological or social structure wherewithal to pull it off. And one of the things when we talk to experts about, does Google make you stupid?

There was a cover story in *The Atlantic* about this, and a fabulous contrarian technology historian basically said, I find myself having more trouble just sticking with a piece of text. And sticking with a piece of writing that I have to do, and sustaining my capacity to research. So it's

got to be bad. And yet, if you care about something, you can find out more about it than anybody in human history could. And so it's a mixed bag. There you go.

Frazierita Klasen: It's a mixed bag. Thank you. Sue, we talked a lot about what's happening at the state level. How can some of this sort of technology and data help local communities improve?

Sue Urahn: Well, I think particularly at the local level is where I think you are seeing some of the more hands-on innovation, and this is not something that we've been involved in so much. But certainly I've read in cities across the country places where if you see a pothole, you can take a picture of the pothole and text it to the city, and they will put it on the list and come and fill it.

So I think there's an opportunity to engage the citizens in the things that matter very much. And at the local level, that's a lot of where the policy community plays, is in the things that matter very much to day-to-day life. In DC, I could send a picture of the pile of rubbish that somebody dumped in the alley behind my house to 311, and two days later the District came and took it away. I never had to talk to anybody. It was all online. It got done very efficiently. So that kind of expectation I think is being met much more at the local level, and we're seeing a lot of cities across the country developing some very interesting interactive technologies.

Frazierita Klasen: Well, it's great. It strikes me that there's also data and technology facilitate more learning across communities too, right? So what one community is doing. You have to wait—30, 40 years ago you'd have to wait for that article to appear in whatever magazine. It appeared, but this can happen much more rapidly now. And we can learn from communities not only domestically, but globally as well.

Jody, we have efforts here to build innovation hubs, and to help reimagine and reinvent the urban communities. Can you talk about how data and tech—how this sort of era of modern invention can help to facilitate some of that?

Jody Roberts: Yeah, I think Philadelphia is an amazing region for that reason, because I think it represents a lot of the hope that is being discussed here, and also some of the challenges that have come up. Especially as someone who grew up in western Pennsylvania, I wasn't sure what to make of Philadelphia. Coming over, we don't think much of each other on each other's side of the states. But it's okay. I've actually learned to love the place.

One of the things that really strikes me is that you have something like the University City Science Center over in University City over on the boundaries of University of Pennsylvania and Drexel. One of the, if not the first, urban research hubs established in this country back in the

1960s. So this idea of, how are we going to create a space outside of just adjacent to these amazing research engines at public universities and private universities, and find a way to help facilitate this process of getting it out into the world? But also as a model for economic development for our cities.

And just the history of that place is fascinating, because it isn't built in. So anyone familiar with that structure, it is a contiguous block for a reason. Because it was not designed originally to be a very inviting place. It was designed to be a place that was for those particular research communities that were adjacent to it, but not necessarily something that was designed for the community.

And right now to have that same center undergoing a reimagining of itself, to start thinking about itself as a public square, to imagine what it means to be putting different kinds of publics in the conversation with one another, and to be stoking a different kind of research conversation. And I think that's part of a larger set of developments that you see happening inside of the region where you have both the University City Science Center, you have the Department of Energy hub that was built into the Navy shipyards as part of when Secretary Chu was in charge of the RPE program.

So thinking very specifically about how do we take spaces that are part of an old economy and a part of an old industrialization and reimagine them for where we think we're going into the 21st century? And very specifically focused not just on technology development, but on technologies, energy technologies that would yield small businesses that would help to reinvigorate the economy of Philadelphia and the region. And so all that's very exciting. There's a lot of really exciting energy happening inside of the city.

At the same time, you have a city that still has pretty great disparity. You have a surrounding region that is still ringed by old industrial towns that have not benefited from these promises. And I think there's both a conflict in here of who remains in the old economy, the industrial economy, and who has made it or is on its way to making it into the data economy. And how we think about not just—I mean so if those numbers are right, and 50 percent of who's already employed is potentially not going to be employed, because they're going to be replaced by robots.

We haven't done much to clean up the mess from the last set of changes in industrial infrastructure. So some work that we've been doing in the community of Ambler, a small town about 20 miles north of Philadelphia, that had its heyday like many small towns across this commonwealth in the '20s and '30s, and never quite recovered from the Depression or the postwar economy. That is a town that is still waiting in some ways for someone to bring back an industry of the past.

Growing up in Latrobe, they are still waiting for steel to someday come back to western Pennsylvania and to come back to Ohio. And they're waiting for coal to come back to West Virginia. So there's still a lack of imagination for what kinds of economies these folks are going to participate in while everybody else is running full speed towards greater biomedical advances, greater advances in data economy, and intellectual infrastructure.

And I think there's a serious problem there, not just because it yields disenfranchisement and inequity. But I think coming back to your point about social identity. This is something that is very, very real in these communities. And I think it can't be understated the extent to which that continues to shape the community fabric. It continues to shape our larger national conversation in national politics. And it will continue to shape the ways in which we decide which kinds of communities are going to benefit and which ones won't in a still-emerging 21st-century economy.

Ambler is actually kind of interesting. They've figured out a way to start moving beyond that. So as a town that used to manufacture asbestos construction materials, there was definitely no going back to that. And so they have started to reimagine what that infrastructure looks like going forward. I think that's been a slower process in places out in western Pennsylvania where I grew up.

I think we're finally past the point where we have to watch steel mills pouring molten steel as the images for when we watch the Pittsburgh Steelers on national television. And I am struck by how long that persisted. That they would still somehow find stock footage of molten steel being poured.

And now it's an amazing—pulling off of the technologies from the University of Pittsburgh, and the University of Pittsburgh Medical Center, and off of Carnegie Mellon, there really is an amazing reinvigoration of that urban center. Whether or not you're going to start to see it in the parts just outside of that urban center I think is something we still need to struggle with, and that the identity part, again, is something that will factor very, very significantly in those conversations.

Dan LeDuc: You just heard Lee Rainie talk about the internet of things and its growing impact on our daily lives, and Sue Urahn talking about policy innovation and how it's changed over time. You can read their essays in Pew's *Trend* magazine, as well as reading more from Bill Gates, who writes about the importance of research, and Alec Ross, who writes about how robots are actually changing our workplaces. You can find it at all at pewtrusts.org/trend.

For The Pew Charitable Trusts, I'm Dan LeDuc and we hope you'll listen again. Let us know what you think at pewtrusts.org/afterthefact.