After the Fact | Technology Today and Tomorrow

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TRANSCRIPT

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Lee Rainie, director, the Pew Research Center: "The internet feels—and digital technologies generally feel—like they're at an inflection point."

Dan LeDuc, host: That's Lee Rainie, who directs internet and technology research at the Pew Research Center. This is "After the Fact," a podcast that's all about data. Boy, Lee Rainie's got it. Under his leadership, the research center has issued more than 650 reports based on its surveys about people's online activities and how the internet's changed their lives. I'm Dan LeDuc from The Pew Charitable Trusts.

We're closing out the year on "After the Fact" with a focus on trends in technology and data, and how these digital advances are shaping our lives. The word that comes to mind is "connected." When the Pew Research Center first began tracking Americans' internet use in early 2000, about half of all adults in the United States were already online. Today, more than 88 percent of Americans are connected to the internet. I spoke with Lee about that data point, and we also took a look at the future. It's going to be different, that's for sure.

So Lee Rainie, welcome. Eighty-eight percent of Americans are now connected to the internet. Another way of saying that is—sounds like just about everybody. What does that mean right now in this day and age? And here we are at the end of this year. It feels like there's got to be something new happening in the digital space that happened this year. What was it?

Lee Rainie: We've been studying the rise of the internet and related digital technologies for 17 years. And the story has been ever-deepening connectivity. And what that's meant is that the internet has moved from a place in the early days when we were looking at it as kind of a novelty to people. You know, they did those weird modem protocols when they dialed into their accounts. And once they started getting high-speed connections, once they certainly

added mobile connectivity to their repertoire, and certainly when social media came into their lives, constant connectivity became a reality. So it's now not a novelty. It's a utility in their lives, and they have changed their expectations about the availability of their friends, and about the availability of information, and about the way that they intersect with their favorite communities and with institutions in the world. So it's gone from being sort of an outlier, little fun thing on the side, to something that's central to people's lives.

Dan LeDuc: And even how we connect to this connection, right, is changing. So we went from, like, keyboards at our computer to now everybody's got sore thumbs. And now it's even beyond that, right? We can just talk to this thing, and it talks back.

Lee Rainie: That's one of the delightful things about studying these technologies is they do keep evolving so that one of the big stories of 2017 was the rise of voice assistants in people's lives. We have just put out information that 46 percent of American adults now use voice assistants. They're talking to their phones. Sometimes they're talking to devices in their homes. And that interface is a big change. It's easier to use your voice, if it can be well-understood, to get what you want out of technology. The other thing that we're recently studying, that was another part of the 2017 story, is that about a 10th of Americans have drones.

Dan LeDuc: A 10th?

Lee Rainie: A 10th.

Dan LeDuc: Wow, that's a lot bigger than I would have thought.

Lee Rainie: And it will be a number that grows after the holiday gift-giving season.

Dan LeDuc: Right, right.

Lee Rainie: And of course, now, you know, drones are a central part of the way, for instance, that the fires are being covered in California. There are now news organizations, there are first-responder organizations, that are getting real-time information about what's going on with those fires thanks to drones. The other big technology story of 2017 was the embeddedness of artificial intelligence and machine learning in so many of the processes that we now use on our devices and that businesses use to advance their causes.

Dan LeDuc: What do you mean by that? Help me understand that last one.

Lee Rainie: Artificial intelligence and machine learning are essentially ways to teach machines how to amass a lot of data and make sense of it and to work alongside human beings as they're making decisions or trying to understand the world. In addition, there are ways now that lots of industries are building artificial intelligence into their processes. So this was the first year, for instance, that insurance adjusters were replaced by machines because algorithms can assess information and insurance claims and make payouts or figure out somebody's risk or credit worthiness as well or sometimes better than human beings. Now there's artificial intelligence in surgical theaters where certain disease conditions and certain treatments are now informed by the way that analytics—evidence from prior information and prior procedures—can inform how the surgeon performs in current places. The way that we do face recognition. Now it's— face recognition is part of the story of everyday life. You can see lots of pictures on the internet where they aren't tagged with a particular name or a particular set of contextual pieces of information, and yet we know the person in those pictures. Our computers now are learning, thinking instruments now rather than just brute computation instruments.

Dan LeDuc: Right, so artificial intelligence is still the cutting-edge stuff for—especially in the world that you study, right? Because you are on the cutting edge with all the data you do. You and I were talking a minute ago before we began this conversation about virtual reality and how that's almost entered the mainstream now. It's beyond cutting edge.

Lee Rainie: People can walk into their favorite stores now, or certainly go to online shopping places, and buy a lot more robust goggles for virtual reality than were available two or three years ago when they first went on the market. And a couple of years from now, they will even be more robust. They are incredibly appealing to people who are, for instance, in the gaming environment. They're increasingly interesting to people who are covering the news because it's a different kind of storytelling and a different way to engage consumers of news and information. It's certainly a big deal in the movie industry and has been for a while. So again, five years from now, we won't even be thinking about virtual reality applications as something that is sort of wild and out there and crazy technology. It'll be something that we witness and participate in, in many respects, as a commonplace of life.

Dan LeDuc: So one of the things you do at the Pew Research Center is try to figure out where things—you analyze where we are, but you're also looking a little bit ahead at where things are going. I know you've done some surveys of experts, right? Where are we headed in some of these areas?

Lee Rainie: We're really interested in exploring the thing that you asked as your first question. What's all this connectivity doing to us, and how will it change when the interfaces that we use, the amount of data that are packed into those exchanges, becomes even greater? So we look a lot at social impacts. And there are ways in which people make the argument that all this new stuff is going to make life safer, more convenient. We're going to know more about ourselves. We're going to know more about our world as all the data from ourselves and our tools—you know, appliances, the "internet of things," smart cars, smart streets, self-driving cars—all kinds of data are now being infused into everyday objects.

So we're looking at the ways in which people think there will be improvements in life, but we're also looking at some of the problems. When we hand off a lot of our essential decision-making or a lot of the data in our lives to algorithms and artificial intelligence and machine learning capabilities, what's that going to do to human agency? Are we going to be able to make all the decisions we want to make, or will we be steered in certain directions by the algorithms that think they know who we are? There are also all sorts of worries about how, when algorithms are a central force in lots of human life, they have biases built into them. Algorithms are devised by human beings who are not neutral creators of things. They've got their own life context and life story. And sometimes their bias is built into the things that they create. It's also the case that the algorithms and machine learning systems learn by the data sets that are available. And sometimes those data sets themselves have some biases in them.

Dan LeDuc: As we sort of learn more about ourselves thanks to all this stuff, whoever's controlling and writing the algorithms is learning a whole lot about us, right? Some people are going to make the case, "But, yeah, but the algorithms are the scientific way to do this. It will mean less bias, actually." Is there some merit to that way of looking at it?

Lee Rainie: Of course. One of the arguments that was a strong theme that came out when we did some research with experts about this is the argument—pro-algorithm argument— essentially is: The test of whether an algorithm is succeeding is not whether it's perfect and

doesn't have any bias and doesn't have any unfair or unequal outcomes created to it. It just has to be better than the human beings who used to be administering that system. And there are plenty of pieces of evidence that algorithms are more neutral and sometimes a lot more accurate.

Dan LeDuc: You know, this is all part of a phrase you mentioned earlier, the internet of things. So for people who don't know what that is—and it's becoming more and more common, but there's plenty out there who don't—explain what that is and tell us about the ramifications of it.

Lee Rainie: It means a lot of things to a lot of different people. It is commonly understood to be connected objects. So it's not just connections between human beings, but it's literally appliances, cars, streets, elements of the environment, elements of the health care system all gathering data and feeding data into assessment systems and analytics. There was a magic moment that actually happened in the year 2010 or 2011, when there became more connected things than there were connected human beings. And the delta now between connected things and human beings is much higher than it used to be. I mean, we're literally talking about— hundreds of billions of connected devices are predicted to come into the world and come into markets in the next couple of years.

Dan LeDuc: Could that be as simple as, like, my TV now can connect to the internet so I can stream movies?

Lee Rainie: Yes, smart TVs are part of that story. Smart refrigerators are part of that story. Cars that have connected systems—even if they're not self-driving cars, there are lots of ways that cars now gather data, assess data, feed data into central analyzing systems. And so those count as internet of things devices. And you can just watch in the consumer marketplace. And every year, there are new gee-whiz or scratch-your-head kinds of connected devices that come on the market. One of the favorite ones that I saw a couple of years ago was a smart hairbrush. Where for $200—as opposed to the couple of dollars you might pay at your local drugstore for a hairbrush—you could get a brush where the bristles had sensors in them. They could tell when they were sweeping through wet hair or dry hair. And they had gyroscopes in the brush that could tell how violently you brushed your hair. It's not a problem for me, unfortunately. But for lots of people, that was thought to be a big advance in things. It would be fed into a central

database that would be available through an app. And so you could tell how your hair grooming status was changing over time. And this is just an example of how connectivity is now a thing that is going to be baked into lots of the old-school appliances and old-school artifacts that people used and some new things that we haven't yet imagined.

Dan LeDuc: It feels like we're going to have less and less choice to unplug. People are going to have choices if they don't want the monitor on their wrist for their health. But it does feel like there's going to be increasing pressure for us to stay connected. It's going to be harder and harder for us to disconnect if we choose to, isn't it?

Lee Rainie: It's one of the most interesting phenomena in the technology world. And as we've built all these connected devices, of course our vulnerabilities have increased. We've touched a little bit on privacy—all your devices essentially being spy tools for the companies that build them and things like that. But there have also been any number of really devastating attacks on elements of the internet that had been mounted by these vulnerable internet of things devices. And so one of the theories—there were some really serious cybersecurity protagonists who are saying that vulnerabilities are so great, and that the problems that they create by going after important utilities or important elements of the infrastructure of our daily world, that people might withdraw, that they feel vulnerable themselves, but they also realize that they can't control the outside world. And they might withdraw. But the counterargument to that was much more powerful among the experts that we talked to. They basically said you can't avoid connectivity. It's hard to live your life now in a disconnected state because people's expectations about your availability are built into social relationships. Your expectations about how easy or difficult it will be to navigate the world is built into your access to that device.

Dan LeDuc: Right, you have to pay a premium to have a lesser device, basically.

Lee Rainie: That's exactly right. In part because one of the reasons those devices can be somewhat lower cost, the connected devices can be a lower cost, is the data they are generating is one of the major assets that those companies are harvesting when they sell the thing to you.

Dan LeDuc: Should we be creeped out by that?

Lee Rainie: There are people who are. There are people now who are creeped out that when they do a search for a product online, ads for that kind of product now follow them around their web-browsing behavior even if they're quite far away from the site where they did the initial querying. We're soon enough moving, with that machine learning capabilities, into an age where predictive analytics are going to be a commonplace thing. So not only will you get book recommendations that are tied to things that other people buy, but they will be based on things that you bought in the past and things at a price point that you've indicated you're comfortable with. There are companies built around: We'll send you a new batch of sort of nice clothes in your size and right for the season and stuff like that. If you don't like them, send them back.

Dan LeDuc: But again, all of this gets back to sort of the algorithms and who's figuring out what and tracing us. Are we creating new challenges for ourselves even, like, sort of at the policy and regulatory level?

Lee Rainie: An enormous policy debate is just starting now. And it will, I would argue, be one of the top two or three most important debates of the next generation, which is the degree to which all of these machines and tools enter the workplace. So artificial intelligence, machine learning, and robotics now are embedded in lots of workplaces. And there's a lot of really interesting scholarship and consultant analysis showing that amazing numbers of jobs are in jeopardy, or at least the skills that are underlying those jobs are in jeopardy. Routinized factory work has been replaced by machines for a while. Now we're seeing it invade the white collar workplace.

Dan LeDuc: Right, right.

Lee Rainie: But the more these machines can learn, the more data that are generated, the more elements of their job that really are routinized and will be replaced by machines. Some of the most high-skilled jobs that are currently available might be at risk in the future if people don't upscale and upgrade what they have.

Dan LeDuc: So, we're completely connected now, but not quite, right? There is still a digital divide in the country. There are parts of the country where broadband isn't as accessible as it is in most big cities. And there's sort of some economic questions, too. I mean, some of this

technology's expensive. Not everybody can afford a smartphone. Not everybody can afford broadband access. What does that say about where we're headed?

Lee Rainie: There are really interesting multiple stories that emerge when you talk to people about digital divides. You're right to point out that the connectivity story itself is not complete. Twelve percent of American adults don't have the internet; 23 percent of Americans don't use smartphones. There are lots of ways in which even people who have those technologies are not particularly adept and savvy about using them. So in addition to the connectivity story, there's also sort of a literacy story and a competence story. And people come out in different places on that.

The people who know how to assess data sources and know how to find their way to accurate information are in much better shape. So there are a whole new host of concerns that move beyond the connectivity question and talk about divides that are based on people's cognition and people's social networks. People who have great social networks are now going to be in better shape than people who have less great social networks. So there are all sorts of ways this cascades through the normal divisions that we have seen in society for forever. And there are all sorts of concerns on the policy side about how you remedy that, how you create learning programs, how you create educational systems that allow people to get the support that they need to get to the right stuff and avoid the bad stuff.

Dan LeDuc: OK, well, that's a generation of stuff for us to be thinking about. As we begin a new year, what's the one or two cool things that you really are going to have an eye on in the coming months?

Lee Rainie: We're going to pay attention more to voice assistants and the variety of interfaces that people are using to connect to their gadgets. We're going to be talking to people a lot about the way that algorithms work out in their lives. One of the marvelous things about being a researcher on these issues is that every year generates new stories, new technologies, new social dynamics that are worth studying. There's a really big Supreme Court case that's going to come out on privacy issues related to smartphones. The question is whether law enforcement authorities need to get a warrant to get access to a smartphone—as they currently have to get when they are accessing a landline phone—or whether those phones are sort of separate kinds of devices. It's an enormously important case that relates to all of the privacy issues that we

were discussing heading into the future. And it's a moment, though, where the internet feels—and digital technologies generally feel—like they're at an inflection point. We've gone through the glory days when everybody had high hopes that they would transform people's lives, transform democracies for the better. We've gone through a period now where there are lots of questions about the impact of these things on our physical well-being as well as our social well-being. But the reason to be talking about it now is that there are still ways probably to influence the course of the future.

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Dan LeDuc: That was Lee Rainie with the Pew Research Center. He's just one of many experts on a wide range of topics we discuss here on "After the Fact." If you're interested in nonpartisan, fact-forward stories that tell the tale behind the numbers, then keep listening. We have more coming your way in 2018, including conversations on timely issues and rebroadcasts of newsy events—all informed by sometimes surprising and always significant data points. Please give us a review on Apple Podcasts or wherever you listen, and visit pewtrusts.org/afterthefact for additional resources on past episodes. Above all, thank you for listening. We wish you happy holidays and a wonderful new year. For The Pew Charitable Trusts, I'm Dan LeDuc, and this is "After the Fact."

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