

TIM O'REILLY INTERVIEW PART THREE - INTRO

Hello again, Ars Technica listeners. This is the third and final installment of a three-part interview with tech publisher and thought-leader Tim O'Reilly - discussing his fascinating career, as well as the rich tapestry of original thinking that fills his recent book WTF.

If you haven't yet heard parts one and two, there are links on the page where this player's embedded, and I strongly suggest that you go back and listen to them before this one.

And with that - back to my conversation with Tim O'Reilly. To set context, at this point in the conversation, we're talking about how automation sometimes actually increases demand for the jobs you'd think it would replace - by making the worker more valuable, and productive - and therefore more desirable to hire. Yesterday we talked about the example of ATM's and tellers. Today we open by talking about robotics in Amazon's warehouses.

TRANSITION MUSIC

Tim O'Reilly: We see it right now with Amazon and Robots.

Rob Reid: Oh gosh. Yeah, that's an incredible example. And, I'll actually quote your own book to you, because I found this example so powerful I pulled out the passage. You wrote, "Robots seemed to have accelerated Amazon's human hiring. From 2014 to 2016, the company went from having 14 hundred robots in its warehouses to 45 thousand. During the same timeframe, it added nearly 200 thousand full-time employees. It added 110 thousand employees in 2016 alone, most of them in its highly automated fulfillment centers." Then you added, "They can't hire fast enough. Robots allow Amazon to pack more products into the same warehouse footprint, and make human workers more productive. They aren't replacing people, they're augmenting them."

To that, I'll add, just a few days ago, and I'll put a link in the show notes. There was an amazing article in the New York Times about this very phenomenon. It's almost like a photo essay. It also has videos of these Kiva robots from inside the Amazon warehouses. And, you see some of the workers, who had formerly just been doing very simple pick and lift stuff. Some of them are now like maestros in front of a symphony, conducting these platoons of robots.

Tim O'Reilly: Yeah. The point is, if we actually use technology to do new things, or to do more of the things that make our society more productive. Again, Amazon will deliver to you, now, in many locations, same day. So, we don't have to run out of jobs. This really comes back to this notion in the book of the collective intelligences.

Rob Reid: Yeah.

Tim O'Reilly: And really, algorithmic thinking. It turns out that if you look algorithmic systems like Google uses to give you search results, or Facebook uses to curate the news

feed. They have what, in the book, I described as a fitness function. It's often called an objective function. And, it basically is the same that you're trying to optimize for.

Rob Reid: Mm-hmm (affirmative).

Tim O'Reilly: So, Google is trying to optimize for relevance. And, they measure it by, did people seem to find what they want? Literally, if Google succeeds, you basically click on a Google result and you don't come back, because it was the right result.

Rob Reid: And, it knows that it was a success.

Tim O'Reilly: That's right.

Rob Reid: Yeah.

Tim O'Reilly: Same thing with an ad. You know, you click through it and you do something. They built their business model around it. Facebook has a very different one. They have this, we want you to click on more, we want you to spend more time. So, even though it looks like they both have, quote, an advertising business model, their business models are, actually, very, very different. But, in each case, this is optimization function.

I started thinking about that as a metaphor for our broader economy. That led me down the path to realize that our financial markets are also one of these great, collective intelligences. And, what is its optimization function? And, this takes me back to this point that the ideas that we plant in this global mind, are so important. Because, in 1970, Milton Friedman planted this idea. The idea was that the only responsibility of a corporation is to make money for its shareholders.

Before that, we thought that corporations had lots of objections. And, they had lots of constituencies. You know, they had to look after their workers, they had to look after society. And, he basically put out this idea that, "No, no, no, no. All of that doesn't belong to the corporation. That belongs to, you know ... We just give the money to the shareholders, and they'll figure it out."

Rob Reid: And, they make donations.

Tim O'Reilly: That's right.

Rob Reid: Those are in voluntary societies, they do that on their own time. And, with the money that the corporation [crosstalk 00:53:52].

Tim O'Reilly: It was a good idea. It was just wrong. Right? We know now, just like Mark Zuckerberg's idea that engagement would actually make for community, and

people would actually make for community and people would be more connected and the world would be a better place. Then suddenly we see fake news and all these things that went wrong with Facebook's algorithms. What we see here is if Mark has to fix Facebook's optimization function in order to deal with the problem of fake news, well, let's fix the optimization problem that we have right now in our financial economy.

If in fact we have this immense technological power which will produce all kinds of human bounty, the challenge that we have as a society is to make it new, to think fresh thoughts, just like the founders after the American Revolution said, "Well, we've gotten rid of monarchy. What are we going to do?" They tried to reinvent the way a country would be governed. I think we have an opportunity in this world of AI and cognitive productivity to reinvent the economy.

Rob Reid:

When you mentioned that huge technological bounty and the need to invest something completely new, it made me think of a term you've used in prior conversations with me. I'm not sure if it's in the book. It's combinatorial innovation. It seems that's where the bounty often comes from. Maybe that's where our opportunity to fix things lie.

As you described it to me, combinatorial innovation is taking completely dispersate technologies that have arisen and weaving them together in ways that create tremendous and unanticipated new things which really magnify what society's gaining from those new technologies. You might say with Uber and Lyft, it was we've suddenly all got GPS in our pockets that have nothing to do with ride hailing. We've got this mobile payment system that Braintree or Stripe or whoever created for completely unrelated reasons. Suddenly they combine into something society shifting that no one saw coming, ride sharing in this case.

You almost get amazing things for free that used to be impossible or wildly expensive by coupling together a few other new things that just kind of happen to be lying around, so to speak, and that when these new things can become an ingredient, maybe this new thing rather, can become an ingredient to something even more amazing, which may create a lot more jobs and social good. I think the example you used with Uber and Lyft was that even in a worst case scenario from a job standpoint with self-driving cars, let's say seven, eight years, ten years down the line, a lot of jobs will be displaced from those, but the cost of a ride might also come down by 80%. So while there's a lot of economic dislocation, a whole realm of new services can arise that are based on the sudden extraordinary ubiquity of transportation, much as the abundance in cheapness of wool led to the rise of fashion. The world laid off a lot of weavers, but through combinatorial innovation, a whole slew of opportunities arose.

Tim O'Reilly:

Well, the possibilities of the future are often lying latent in the field of our vision, and we can't see them. Then suddenly we do, and we rewrite the world. That's the central idea is that technology is this tool of amazement. The title of

the book, WTF, WTF can be an expression of amazement or an expression of dismay.

Rob Reid: Right.

Tim O'Reilly: A lot of people are focused on the WTF of dismay when they think about technology in the future, and it's our job as technologists to make the WTF of amazement be the one that guides us.

Rob Reid: I think maybe the dismay filter is so compelling to us humans, because when we were evolving on the Savanna, it was so important to prevent losses. Maybe it's a result of that, when both amazement and dismay can be appropriate, we often only feel the dismay.

You mentioned something that kind of exemplifies this in your book, which the VR pioneer Jaron Lanier said. I went and dug up the full original quote. It's from the preface of this book from 2013, *Who Owns the Future*. He says, "Here's a current example of the challenge we face. At the height of its power, the photography company Kodak employed more than 140,000 people and was worth \$28 billion. They even invented the first digital camera. But today Kodak is bankrupt, and the new face of digital photography has become Instagram. When Instagram was sold to Facebook for a billion dollars in 2012, it employed only 13 people. Where did all those jobs disappear, and what happened to the wealth that all those middle class jobs created?" Now that's a despairing WTF. But there's also a very uplifting WTF in your book that looks at digital photography through a completely different lens, if you'll pardon the pun, that I found brilliant.

Tim O'Reilly: Well, first off, I've always found the Jaron Lanier notion to be sort of impossibly wrong, because the idea that Instagram represents digital photography, when you think about the mountain of work that's required to bring us Instagram is the little tip of this massive economy, of data centers, of Internet connectivity, of manufacturing of phones that are more ubiquitous than cameras ever were.

Rob Reid: Ever were, yeah.

Tim O'Reilly: You think about the number of little shops there are everywhere selling cell phones, how many people work for Comcast than T-Mobile, Sprint, all the carriers, and all of the cable that had to be laid, just immense amounts of work in order for that Instagram culture to exist.

Rob Reid: You also make the point in your book that in a very real way the rise of digital photography enabled vast new platforms, ones that verge on being almost economic sectors, like Airbnb to arise. In the specific case of Airbnb, the pictures that the hosts were posting on the site were terrible at first and people weren't using the site as a result. Would you mind sharing that story?

Tim O'Reilly: Well, it was basically one of the things they realized when it was not really taking off, Brian and Joe went to New York and they talked to hosts. One of the things they figured out was not having good pictures was one of their blocks. They were good with design, and they basically went around and took great pictures of the hosts, and the whole thing took off.

Rob Reid: That was the turning point.

Tim O'Reilly: Then they literally hired a team of photographers and on behalf of their hosts photographed their places for them, and that was this critical boost to their platform.

Rob Reid: Which has created significant income for several hundred thousand Airbnb hosts, which we don't instinctively think of as offsetting the losses at Kodak. In the book, you also talk about lots of ways wealth can be share that go beyond straight ahead salary structures.

Tim O'Reilly: If you look at history, there's a lot of ways to pay people more. One is reduce working hours. People in the factories and sweatshops of the Victorian era and still in many parts of the world work 80, 100 hour weeks. We reduced that to 40 hours. We took kids out of factories and sent them to school. Whether it's literally cut back working hours or whether it's introduce new kinds of benefits, like family care or time off, is really a way of reducing working hours. New kinds of educational time off are all ways that we could pass along more to the workers.

The question is why don't we? It's because we have basically ... we're really in the thrall of our financial markets. You can really see this with a company like Apple. Here's Apple, the most successful company in the history of the world when it comes to profits. These are profits in the real market of people who give you money for your stuff, and you have actual cash. They don't need any money from financial markets, and yet they're still somehow slave to financial markets, so that somebody like Carl Icahn can come along and buy a position in the stock and say, "We're going to fire you unless you give us that money." They are compelled by the master algorithm of our economy to keep making more money, to keep their stock price going up. That's my economic screed that's in the heart of the book, what we learn from technology is that technology wants to fix things.

Rob Reid: How do you wake the algorithm differently at O'Reilly Media? You're pretty much immune from the markets, right? You never took venture capital.

Tim O'Reilly: Right, we're a private company. Again, in our small way, we try to pay people well, as a platform, our online platform Safari, we think all the time about the health of the entire platform.

Rob Reid: How many folks are at O'Reilly now?

Tim O'Reilly: About 400.

Rob Reid: About 400, that's a good number. How many books have you put out now? Is it hundreds or is into the thousands?

Tim O'Reilly: I'm sure it's many thousands at this point.

Rob Reid: Many thousands.

Tim O'Reilly: Yeah, we've been doing this for 30 years and multiple editions and books come and go. I don't know if it's tens of thousands, but it's definitely many thousands.

Rob Reid: That's a lot of books, and I say that as an author. Speaking of which, I know from prior conversations that science fiction has impacted you a lot ever since you were a kid. To tap briefly into your own inner science fiction author, do you think the people of the future will have a relationship with technology that's basically an extension of what we've experienced, or do you think they'll be transformed by technology in fundamentally different ways?

Tim O'Reilly: Yes, the people of the future are going to be transformed by technology in different ways. I was very conscious of that also when I was a kid. My brother used to refer to me as the failed hunter-gatherer. I was blind as a bat from reading too much, and I didn't wear my glasses. I was adapted for a world that was coming. I was not very well adapted to the schoolyard world that I was living in. I was this little bookish kid who didn't play sports and didn't ... Again we saw that whole Revenge of the Nerds kind of thing. Anyway, I was one of those nerds.

I think the people of the future who have access to just knowledge on demand, way beyond what we have today, where this sort of ambient computing, ambient knowledge. I do think we will get to the point where we have ... Certainly we're going to have pervasive Alexa-like experiences that are connected. There will be many, many objects that we can talk to and that will understand what we are asking them to do. Certainly, I think we will have some kind of AR heads up display, at least until we get to the point where we have direct neural interfaces. I think neural interfaces are, certainly neural output is already on its way, whether it's muscular based, some amazing work being done there, whether it's not necessarily going to be electrodes implanted in your head, but we are going to get there to a very different world.

Unless, unless we take another path, which is that we turn against technology. That's the thing that I guess I've always had in the back of my mind as a classicist, and that is that, Ray Kurzweil likes to say that yes, there's been this continual through the middle ages through the dark ages, this continual march of progress, and he draws these graphs. I go, yeah, but for the people who were there, who were part of that, it didn't feel like progress. I think of this wonderful passage in a medieval manuscript, there's this period of about a hundred years

of war, and it was referred to as the time when Christ and his saints slept. We could have a time like that, too, where things are terrible.

Rob Reid: Because we've rejected technology perhaps like a Luddite type of thing?

Tim O'Reilly: Well, it could be that we rejected technology, but more I think about it the biggest challenge is going to be that ... You think about climate change and you think about what we just experienced in Houston and now in Puerto Rico, these terrific natural disasters and happening all over the world. You think about how much of our economic activity is going to be diverted towards fixing those things. You're going to end up with disasters, you're going to end up with more and more refugees, you're going to end up with political instability, and the whole thing comes crashing down. That's a very dark scenario that is very much in the realm of possibility.

I end the book actually with a little exercise in scenario planning, which of course is this discipline for imagining very different futures, and then thinking about what is a robust strategy, which is a strategy which makes sense in the face of these wildly divergent futures, one in which there is incredible abundance and one in which there's the collapse of society as we know it. To me, the strategy that is good whichever way you go is one in which generosity and trying to build a better world for all of us is part of it. We will make better decisions if that's our operating premise.

Rob Reid: Are you worried about people turning against technology? We've seen what might be early signs of that in San Francisco, if not yet against technology per se, there have been throwing rocks at the Google buses and so forth. There are a couple speculative passages in your book where you talk about the Luddites going way back, and you talk about the possibility that perhaps in reaction to say maybe it's climate change or other things that people have dissatisfaction about, inequality, there might be a turning against technology?

Tim O'Reilly: Oh, absolutely. In fact, one of the reasons that I wrote the book was that I saw this coming. I started this conference called The Next Economy Summit, and I started working on it in 2013 because I was seeing this coming, that we were going to turn against technology because technology is being used to put people out of jobs, this narrative about disruption and we're going to get rid of this. The counter-narrative I was trying to put out was like, "No, that's not what technology is for."

We saw this vlog recently around this startup called Bodega, and it's like, "We're going to disrupt the bodega, the little corner store. We're going to put them out of work with automated kiosks." My wife, Jen Pahlka, wrote a piece three or four years ago called Bodega 2.0 that was the real vision of what would be the disruptive pattern for bodegas. It's how would we build a platform infrastructure for bodegas so that they had the kind of intelligence about what the market wants that Walmart has, for example?

Rob Reid: Augmented bodegas like augmented workers.

Tim O'Reilly: That's right, augmented bodegas, platforms where they could buy stuff for cheap, so the people in these poor neighborhoods would actually have access to cheaper food, not be the people who are the poorest have to pay the most for the worst products. How would we solve that problem? That's what Silicon Valley should be working on. That's Bodega 2.0, not some automat so that we don't have to have a proprietor there.

Rob Reid: This just reminds me that one of the things I love about your book is the extraordinary empathy you express for even the angriest, let's call them disruptees. The term Luddite is almost always used, especially by folks in tech in a highly pejorative way, and there's very little empathy for them. But there's this wonderful passage that again compels me to quote your book back to you.

When you were talking about the pain that the actual historical Luddites were motivated by when they wrecked those machines, and you said, "But those weavers couldn't imagine that their descendants would have more clothing than the kings and queens of Europe, that ordinary people would eat the fruits of summer in the depths of winter. They couldn't imagine that we'd tunnel through mountains and under the sea, that we'd fly through the air, crossing continents in hours, that we'd build cities in the desert with buildings a half mile high, that we'd stand on the moon and put spacecraft in orbit around distant planets, that we would eliminate so many scourges of disease." That is just profoundly empathetic, optimistic, and very lyrical.

Tim O'Reilly: I also said, and they could not imagine that their descendants would, I forget exactly how I said it, enjoy fulfilling work bringing all this magic to life. Yes, that's so true.

Rob Reid: That's kind of what's at stake. Now we could go up another level comparable to that-

Tim O'Reilly: We could.

Rob Reid: ... if we don't turn against this.

Tim O'Reilly: That's right. Actually, probably my favorite story, I try to end on a bunch of positive entrepreneurs who are doing positive visions for the world, but probably my favorite story, because it's a collective action story, is the story of the high school movement in the United States, which began in 1909 in Iowa, where the people realized that their kids wouldn't need to work on the farm, that their kids were going to be put out of work. There was basically this organic movement that spread. From 1909, 9% of eligible age teenagers went to high school.

Rob Reid: In '09 in the United States?

Tim O'Reilly: Yeah, and by 1935, that's just 24 years later, it was up to 70%.

Rob Reid: Wow.

Tim O'Reilly: These people just basically spread and people taxed themselves and they started schools, and basically they transformed the economy. We have these enormous moments of transformation like that, where people go, "Whoa, this ain't working. We can do something different." This whole generation that expected that just like their parents they'd work on the farm, suddenly didn't have to.

Rob Reid: That phrase, didn't have to, is so powerful because it sounds like they started out thinking they couldn't work on the farm, which had to be terrifying. But then moving from couldn't to don't have to is so bold, and it led them to create something so much bigger. That's exciting.

Tim O'Reilly: The thing that really triggered me into that story was this wonderful statement from Bob Putnam, the author of *Bowling Alone* and various other books. He said at a meeting I was at, "All of the great advances in our society have come when we have invested in other people's children." I love that statement, because that is what is before us. We have to invest in our children and our grandchildren. When we think about them as the object of our economy, to make a better world for those who follow us, we are going to be able to create this magical world where WTF is an expression of amazement. That is just like those people I described from the early days of the Industrial Revolution would be so amazed.

Rob Reid: Right.

Tim O'Reilly: We will be so amazed if we get this right.

Rob Reid: If we get this right.

Tim O'Reilly: We will be so amazed at this magical working economy that works by completely different rules and anything we can imagine today.

Rob Reid: Well, let's hope that something equally lyrical to that beautiful paragraph that I couldn't help but quote to you could be said a couple generations from now about the things we can't imagine that hopefully lie in the near future. I like your idea of ending on a positive note, that's a positive one. You have been outlandishly generous with your time. Thank you very, very kindly. This was a fabulous conversation.

Tim O'Reilly: All right, well, thanks a lot, Rob.

Rob Reid: So I hope you enjoyed that. That was actually my first ever proper conversation with Tim. We've crossed paths a few times over the years and exchanged brief

pleasantries, but that was the first time we sat down and talked one-on-one for longer than even a minute. It was a great honor and an education for me. It was also wonderful to be able to document such a personally significant conversation. It's just too bad I had to use my iPhone to do it. Apologies once again for the sound quality. It's ironic that this should happen just a few days after none other than Sam Harris publicly called me out, quite appropriately I'll add, for the consistently low quality of the consonant p as recorded in our interview. Apologies to Sam as well as Tim. At episode 10, I still have a lot to learn.

If you enjoyed this interview, you should seriously consider checking out Tim's book, WTF

Personally for me, the book was a feast. Although I should note that in many ways, I'm the ideal audience for it. I'm fascinated by the history of the commercial Internet, which when he wasn't personally shaping it, Tim documented for me front and center seat. I'm also optimistic by nature, almost pathologically so, according to those who know me the best. So the book's largely optimistic message resonates strongly with me, and I love elegant counterintuitive framings of complex events and processes, a domain that Tim has few if any peers in. His response to Jaron Lanier's dower comparison of Kodak to Instagram is, to a mind like mine, a veritable work of art.

END INTERVIEW ELEMENT OF PART THREE

So Ars Technica listeners - here we conclude the third and final installment of my interview with Tim O'Reilly. I do hope you enjoyed it .

And if you do enjoy my work, I hope you'll consider visiting my site, at after-on.com. Or, just type the words after-on into your favorite podcast player, and scroll to through the episodes. You'll find lots of stuff about life sciences - above all, genomics and synthetic biology. Conversations about robotics, privacy and government hacking, cryptocurrency, astrophysics, drones, and a whole lot more.

Or you could join me in September here on Ars. Yes - September. We're taking August off from this lunchtime series to let everyone to better allow one and all focus on the tail end of the summer. Or, the winter, if you're in the southern hemisphere. But starting in early September we'll be back again, with lots of fascinating conversations about tech, science, and society. I hope you'll join us then.