

# Re-Engineering the Web Around People

## An Interview with Tim Berners-Lee

### Interviewer:

David Kirkpatrick, Techonomy

(Transcription by [RA Fisher Ink](#))

**Kirkpatrick:** Let's get started by bringing up on stage to join me, the great Tim Berners-Lee. Thank you so much for being here. Introducing Tim Berners-Lee is a challenge because he has done so many things. He invented the World Wide Web in 1989, but not only did he invent this extraordinary global facility, that has had I think even more success than he probably would have even guessed, but he's created a number of institutions to help oversee, govern, and advocate for it.

The World Wide Web Consortium, the World Wide Web Foundation, the Open Data Institute, and he's been honored extensively for these many accomplishments. He was named one of Time Magazine's 100 most important people of the 20<sup>th</sup> century. He was knighted by Queen Elizabeth in 2004. But the way I think of it, most of all, is that he has served as a steward and guardian of his own invention, which I think is really impressive. And especially when we think about half the world is going to be online in the relatively near future.

And just finally let me mention he just, last week, announced something called The Contract for the Web, which we're going to talk about. He also is currently on sabbatical from MIT with a significantly reduced role in the institutions that he helped found to help promote and develop an opensource project called Solid, as well as a company called Inrupt that is intended to help Solid succeed. So that's a lot, Tim, but it seems like it's even more in the last two years than it has been in the past. I mean, your contract for the web, which has been signed by Facebook, the government of France, Google, many, many other organizations, why is this kind of thing needed now? And what is it that's causing you to really even further up the level of your own activism and stewardship?

**Berners-Lee:** Why aren't we done yet? You'd think. Thirty years ago, 1989, I proposed the World Wide Web and wrote the code and stuff. And very quickly, the first thing that was necessary was the consortium, and the reason we needed the consortium was all the industry actors needed to collaborate to build to standards so that there would just be one web. So, the threat then was the web would fragment in to different non-interval pieces, none of which would really have the critical mass to fly. I'm not sure if that works? So, the concerns back then though were to keep one web and that's with standards and so going to working groups, you need to thank all the people you know who invented standards.

**Kirkpatrick:** That was the roots of the consortium.

**Berners-Lee:** That was originally—and so then to get to the point where we were sitting around one night and realized that 20 percent of the people we heard on the planet are using the web. Well, it turns from being a cool project to being a responsibility at that point. So Rosemary Leith and I founded The Web Foundation, at that point, with I suppose a broader mission than the Web Consortium. It's about standards. It's about making the technology work. The Web Foundation is looking at all of the ways in which we need to make sure that the web serves humanity. And the first part of course, when there was 20 percent of the world, obviously the big question was, "Yes, but what about the other 80 percent?" So, The Web Foundation spent a lot of time working with people to get to point that we're almost at now.

And so, as the thing spread, it became now that it's almost 30 percent of the people are connected, and so obviously there's a big sort of responsibility thing, and I think anybody, if you used the web for 98 percent of your time, you should spend the other 2 percent just looking out for it, not taking it for granted. And looking out for the people who haven't got it yet. But then a couple of years ago, I think, a lot of people did a complete reset, because there was a philosophy that we had used happily all those years, which we had to reset. Because somebody would come to me and say, "Hey Tim, I looked at your web, and there's bad stuff on it. You know, there's some fake stuff on it." I said, "Yeah, well, don't read it." You have bookmarks. You have people. You have blogs that you follow. If somebody leads you to bad stuff, don't go that way again. And so, basically the web is not email. It's not spam. If you find bad stuff, it's because you've gone and followed the wrong links.

That philosophy, that it's really my duty to go and find good stuff and read it, was fine until a couple of years ago. And then suddenly realized that the fact that there's a bunch of junk out there; there's a bunch of fake stuff out there. There's nasty stuff out there, actually there are lots of people who do read it, and they vote. Oh! So, then the Web Foundation sort of wrote us a web birthday memo saying, "We need to change course here. It's not just about keeping it open and free and assuming that good things will happen." We're not just going to sit and wait until everybody becomes a Wikipedian, and we actually have to analyze—we've been saying—we started the web science research initiative—

**Kirkpatrick:** Sorry. It's hard to keep them all straight. I'm impressed that you can.

**Berners-Lee:** But the web science was about a big complex thing. We don't understand it. We have conjured a science to look at the brain, and there more webpages out there than there are neurons in your brain. And so, we need a science for that. So, there was a feeling that—there had been always a feel that we don't really understand it. And then a couple of years ago, then there was the realization that understanding it is really important, and I think a lot of people have come to the conclusion from different points of view that, yes, we need to get together and lots of different people involved in different ways, but this is not right. We can do better. We need a seriously needed course correction.

The initial utopia has curved to become what a lot of people out there on [the] street feel is a pretty dystopian world based on the web, a pretty dystopian web. So, how about—how can

[we] rethink? Change a lot of the rules. So, a lot of activity recently. Yes, partly a startup with new technology to give people control of their data. But also, the Web Foundation producing a contract for the web that we announced a few days ago, in Lisbon, at the Web Summit.

**Kirkpatrick:** Which has core principles that the web was designed to bring people together, to make knowledge available freely. Everyone has a role to play. And it has goals for governments for companies and for citizens to be activists. And I won't read them all, but they're very aspirational. They're very inarguably great, and you've—do you feel pleased with the response to it so far?

**Berners-Lee:** Well, we're only starting. So, what you do then is you go to the Web Foundation start site, [webfoundation.org](http://webfoundation.org), for the web and you can then find the contract for the web, and we've got those aspirational principles, but now what we have to work out is what in practice everybody to do in more detail. We announced that this process will start, and we will have lots of working groups, and you can get involved. You can sign up to say, "I think the principle is a good idea," and then you can join, because the discussion about what we've actually put in the contracts, and some of those things will be easy like freedom! Bad words! Everybody! And some of them will be tricky like no hate speech but freedom of speech and things like that. So a lot things will have to have serious discussions about where to draw the line and who to leave in charge of defining where that line goes, where you have two great principles but actually they conflict in some ways.

**Kirkpatrick:** So, there's no easy answer there, for example.

**Berners-Lee:** Yes.

**Kirkpatrick:** I mean, you heard me talking in my intro about the respective roles of business and government, and one of the interesting things about the web was it was sort of a creature of neither for most of its history. But I think it's been perceived in the last couple of years to have become a creature of corporations, and I think a public perception that is very much in parallel to a sense that way too many things are going wrong on it under the control of corporations. Does that imply or do you believe that what we really need especially is for governments to understand this facility and to engage more aggressively with it, at least to understand it and help to govern it? I mean, it's hard for me to understand what's needed there, but what do you think?

**Berners-Lee:** I do think, certainly, when I'm telling people, you tell kids, girls particularly—you tell all your girls to code, to get into tech, get a computer and learn how to code, not because we need you building the new user experience for another website, because we need [them] in Parliament and in Congress. We need people in positions where—and in judiciary, we need people who understand what a computer can do. So, when you've coded a computer, you have a completely different attitude. You realize when you look at this thing that it can do whatever you program it to do. So, when you go to a social networking site, you realize that this site, this has been set up by some people and they could change it.

It was hard enough—it was really hard to get some people to believe and to really determine that climate change was anthropogenic, was made by people. It seems to be ridiculous that sometimes people seem to forget that the social networks are anthropogenic. So, they write about it like they're writing about the weather, but actually it's all code.

And someone from Facebook will think about things, and they think well, we are going to have eight different emojis that you can pick and, in a way, they changed the whole world of people on Facebook by allowing you to be more subtle in what you say when you like something, for example. There are lots of decisions being made all the time in social networks.

And so, one of the things which is part of the contract is that if you're a company, you really need to try to think not about just to what extent you can more efficiently ambush your user from doing what they were trying to do to into buying something that they didn't really need which is [the] current model, but try to actually help them be part of a system where they will end up having constructive conversations, where they will end up learning more from the people that they disagreed [with], being about to build—you can tweak the way you built these things so that humanity behaves in a different way.

**Kirkpatrick:** Right, that's such a wonderful concept that we need to talk about more, so thank you for that. It's interesting. When you were calling out some of the challenges in the beginning, you said, you know, "Freedom of speech but more respect," I mean, to look at it broadly; less hate speech, less fake news but freedom of speech. Is that to something that you think is simply of function of better design?

**Berners-Lee:** I think to a certain extent. I think what—to plug the web scientist piece of this, what is really hard is not obvious. When you build something, you build a technology, typically it involves the way two people interact. So, somebody makes a link. Okay, on the web. I made the technology so that when you click on a link, then suddenly you will get transported, and I made a technology so that when—originally in the web browser, you could make a link. You could sort of highlight things. And so, you could construct this web of links and that was how this technology worked, but the reason it worked was that people wanted to make links, and they wanted to make links because they wanted to make their blog be apparently very high quality, and they wanted it to be apparently high quality, because they want other people to link to it.

And when other people link to it, more visitors will come and then the counter on the bottom of the page—and do you remember those blogs, they used to have a count of how many people have read it on the bottom of the page, before Google Analytics, and they would just live for that counter going up. So, they were driven by the counter going up. That meant that they had to get people to link them. And so, that mechanism of each person just thinking, "Oh! It's just so exciting to be blogging, and there are more people reading it today," together, made this ridiculously valuable blogosphere that they felt great to be a part of it. So the macroscopic effect of the blogosphere was a huge amount of value. Just from a little bit of microscopic design of somebody putting together a website. So, when you look at something like Twitter,

when you look at any social network. You look at Reddit, so Reddit has the ability to vote things up and down. When I did an Ask Me Anything on it, I thought it was useful. It was actually useful because lots of questions came in, but the people who asked the questions themselves voted them to the top, so I could just look at—take the top list of most popular things. That was a really neat system.

If we built systems which allowed people to have good political discussions, for example, then we should have better politics. We should—if we build systems which—one of the things I've suggested to social networks like Facebook is a stretch friend. If you're building a social network, this is the only thing I can think of to make it better, but as I said, not instead of everyday you suggested I become friends with somebody who's a friend of a friend. Basically, you're looking at my friends. You're thinking, "Oh! You've missed this one. These people all know each other, but you've missed this one, so add that one," and you will end up with a solid knot of people who all know each other. The parties will be cursed.

**Kirkpatrick:** Also known as a filter bubble.

**Berners-Lee:** Now called a filter bubble, and so if you every time you suggest to me people who are friends of friends already, I will end up with more and more of this lump of a filter bubble. Suppose you could say—by the way—slam dunk. You're going to like these people. Here's somebody who's just like you in almost every respect, except they live in Iran, they're male, they're a computer scientist, they speak English, but they live in Iran. Or they're computer scientist, they live in America, but they're female, and sort of suppose you just stretched somebody along each axis and say, "You know, if you don't mind, how about making friends with this person?" You'd automate it, presumably, completely, and just try to throw in little things, so bit by bit, people get introduced to people who are a little bit different. What could that—then when you step back, suppose you introduced that today, would people look back ten years later and say, "You know, that was what did it?" Just a stretch friend. That's all we needed to—it isn't all we needed, but we need lots and lots of ideas like that.

**Kirkpatrick:** We need a lot of ideas like that, and it's great to hear you suggesting a good one. What is Solid and how does it fit in to what you're telling us here? I mean, one of the contract principles is companies will respect consumer's privacy and personal data so people are in control of their lives online. I assume it's very much connected to that particular target, but tell us what all it is, because you're spending a lot of time on it.

**Berners-Lee:** I am. Solid is web technology repurposed and, if you like, it's a layer on top of the web, using web. Solid is a technology, which is driven by the belief that you should control your data, so that means—by your data, I mean not just your name, address, and telephone number, and your social security number, all those photos, all that stuff, all the things that you do on social networks. You should control that. That means you should be able to share it with whoever you want. You [should] be able to share it with nobody. And you should own it from scratch. So, we should have the world where actually you don't have to worry about somebody monetizing your data, and in the process of that monetization happening, some bad actor

getting hold of masses of data including your bit, and then horribly manipulating an election by using all that insight they gain from that data, because actually you're storing your data in your own place.

You have your little private clouds. We call them pods. And these personal private clouds, they're a little bit like having a [Google] drive or a Dropbox, except that they all have an API. And what was magic from the technical point of view about Solid, is that we say—instead of having for the Twitter website, a Twitter API, and for the Facebook website, a Facebook API, and for the Strava website, a Strava API, we say one API. You write an app, whatever it is, it just talks to a Solid part, and that is the magic there. We have one API common, a Solid API for everything. Every Solid service supports it.

You can run it on a server in your basement. You can get Solid servers at Solid.community or Inrupt.net or other things coming down the road. You can—hopefully, there'll be lots and lots of people who'll give you different types of storage service but all looking the same, all looking [at the] same API. And so, when you saw any Solid app, that app is completely separated from the data. You're very used to going to a website, deciding when to meet, so you go Doodle.com and doodle—and you tell Doodle.com all about when you can meet, and it stores it. The guy who wrote Doodle.com had a good time writing the app, but also he wrote some Javascript. He wrote the stuff that runs in the client, and he wrote also some stuff that runs on the server.

And every time he added stuff to Doodle.com about how you could meet, he'd have to change both sides. In Solid, it's different, because you wrote the app in a different way, so it just writes whatever data it needs to our generic store, using a generic API, and so when [you] go to something at Doodle.com, they'll say, "Where do want to store all this?" And you'll think, "This is home or this is work. Oh, this is work. I'm going store this on my work pod." And so, then once you're working with that work pod, you could then share it with anybody.

Cool thing is you can share it not just with the people you would have expected to share it with before, because even though it's a work thing, it's Solid. So, you can share work things with family, and you can share family things if you want. You're used to sharing your medical stuff with your doctor by going to the hospital website, and you're used to sharing your photos with your cousin. Well, in a Solid world, you might have taken a picture of your knee. Might want to share that with the doctor, you could do that. He's got a Solid ID. And actually, your medical staff, you want to share all of that with your cousin, because that's just the cousin is going to be your medical number two. And so, just deciding to do that, because you have the power of real data, and you can share it and do anything is one of the things which I think is incredibly powerful about Solid world.

**Kirkpatrick:** And the name Solid is meant to suggest the control that you have over it, that it's kind of solidly under your control, or something like that?

**Berners-Lee:** It was, at one point, I think it came from originally, we were talking about social-linked data, because the fact that it's linked between other things like you can raise an

issue—you do anything about anything. You can like anything. You can have a chat about anything, so it's very linked and it's social but in fact, now it's just Solid. It's just a name.

**Kirkpatrick:** Well, it's a good name. I want to hear from the audience. I think we should let you have a chance to ask Tim questions or make comments. Identify yourself please. Is that John?

**Mattison:** Yes. It is.

**Kirkpatrick:** You're the chief medical—chief technical officer at Kaiser—

**Mattison:** Kaiser Permanente and in Singularity University, I teach as well. The question I have is I love the idea of separating the data from the application layer. My question is applications operate on data, so how do you give temporary permission to the application to have the data under it and its substrate for action without implementing something like a distributed ledger of sorts. What happens on the other side of the API in the application space that retains the control of those data over time?

**Kirkpatrick:** Briefly.

[LAUGHTER]

**Kirkpatrick:** Because we want to get to others, but it's a good question.

**Berners-Lee:** Your app, if it's an independent service, so it runs on another computer, it has an ID just like a person, and if you're running something that is going to look at my medical records and I'm going to let you use that to decide what sort of insurance to give, then I could explicitly give that app, because it has an ID. I can put apps that I trust into groups, just like people, so—an app is an agent. I think that's the answer to the question, and I'm not going to go [into] any more depth, because I've been asked not to.

**Kirkpatrick:** Since he works at Kaiser, I'm sure he's a good person to have understand it later. Okay. Who else has a comment or a question?

**Zomorodi:** Hi Sir Tim, it's Manoush here, tech journalist.

**Berners-Lee:** Hey Manoush.

**Zomorodi:** Nice to see you.

**Berners-Lee:** How's it going?

**Zomorodi:** Good, thanks. I told 800 marketers and advertisers about Solid, last week, at an event.

**Berners-Lee:** Uh-oh.

**Zomorodi:** And they looked horrified. But what I couldn't tell them was how soon it was going to be rolled out. I wonder if you have any idea about what sort of the timeline is? When consumers will be able to start testing it? Because I know that a lot of people are really, really excited about the concept.

**Berners-Lee:** So, we're thinking—

**Kirkpatrick:** Good question.

**Berners-Lee:** Yes, and there's another implicit question in there: Should we all start using it now? No. Not unless you're a developer. So, what we have said—we tried to make a very gentle rollout. The *Vanity Fair* article maybe didn't help let it be very gentle and we kept the whole Inrupt website quiet for a long, because we—

**Kirkpatrick:** That's the company part.

**Berners-Lee:** —the company quiet. But basically, we do want you if you're a developer. So, we do want you if you're a partner. We do want you if you want to invest, frankly. But if you're a user, then maybe sometime next year. It's really hard charge when—basically, if you come to it now, you can get an account. You can get an account at Solid.community.

And for example—it's a bit rough around the edges, the user interface. You can do all kinds of things, but you really have to know how. Developers hit that and they think, "Wow. This is neat, but I could do better than that with a user interface." So, they're all working on—so we're getting people designing apps. We're producing support for developers, so if you're a developer and you have a particular user interface framework you use, then we want you to be able to plug in very easily into Solid, so we're working on very different frameworks. This is time for developers.

Consumers? Sometime next year. And we might start with early adopter communities. One possibility with journalists, because they're curious, often they have need for sharing. They may want to set up their own Solid pods in a privacy respecting place like Berlin and interview their sources there, for example.

**Kirkpatrick:** Okay. Well, let's get to this person over here. And please identify yourself.

**Goldberg:** Hi. My name is Dave Goldberg. I'm from Capital One. I think the concept of ownership of data is difficult to wrap, at least, my head around. For example, in the case of the hospital, where the line is between a patient's data and the hospital's data doesn't seem clear at all, and it doesn't necessarily seem to be something you can work out with technology as the solution. Do you have a view on how you can mediate between what is the service provider's data, because they need that in order to operate, versus the individual's data?

**Berners-Lee:** Well, it's an interesting question. First of all, yes, we don't like talking about that you own your data, prefer control. Because when people sometimes talk about owning their

data, then they talk about you selling your data, like it's oil. Data is not the new oil. Because oil, when you sell it, somebody else burns it, you don't.

With data, you give it to somebody else initially, the fungibility is different. And so, data is not something that you should feel as something, which you should own in the sense of something as an asset. You should control it, because being able to do stuff with your data, being able to run apps that have access to your data is something which you are going to wonder how you ever did without it. We could do it for the bank too, for example.

But so, for the hospital, clearly all my test data, all my diagnostics, all of the stuff which I have been part of, then I would imagine the health system at the moment in the States, I can download that stuff onto my computer. It's a bit painful. It tends to come in PDFs rather than XML files, but I'm sure we'll get in that direction. So, stuff that I'm aware of, I think, obviously, the hospital will store it, and obviously I will store it. And I may store it in several places, and they may store it in several places. So, they may store a copy of it off of the system, and they may have a copy of it locally. I may have a copy of it always on my phone, because not having it isn't a risk I want to take.

So, but I think where the line is, probably if you want to have an argument about it, then go to Europe and talk about it to the GDPR people, because they must have a way of answering that question. So, if, for example, you have derived data from me in which you categorize me by my demographic, I think GDPR would say, "Yeah." Even if you derive data which I have never seen, and you've decided which data demographic it is by looking. And then, actually anything which is about me, under GDPR already you have to give the ability to correct, to access and correct.

So, for example, another thing, a bank for example, a bank statement. The bank statement is the relationship, is the status of the relationship between me and the bank. It says basically how much I owe—we owe each other. And that status is just—every time something happens, we update it, and I [imagine] we'll both keep a copy. I want immediately to have my local copy on my phone and my laptop and my server. I want my bank statements to be updated immediately, and I expect the bank to be keeping it on each continent on which they operate. So, and yeah, the GDPR. If you look at the people addressing GDPR legislation and Europe, I think they must [have] algorithms for answering that question.

**Kirkpatrick:** Unfortunately, we're out of time. Very imminent, interesting questioners too. But, thank you so much Sir Tim. It was really helpful to have you here and to be—really understanding the seriousness with which you continued to take the stewardship of what you invented, and I think we all have you to thank for so much. So, thank you very much.

**Berners-Lee:** Well thanks for having me here.

[APPLAUSE]

**Berners-Lee:** It's great to be in such a thoughtful audience as well. Good questions.