

EPISODE 780

[INTRODUCTION]

[0:00:00.3] JM: The Internet has transformed humanity. The internet is the result of a long series of innovations, from military, academia, business and the open source community. In his book *How the Internet Happened: From Netscape to the iPhone*, Brian McCullough tells the story of the last 25 years of internet development through the lens of companies like eBay, Amazon, Google and Apple. Whereas other books have focused on the trajectory of these individual companies, Brian explains how innovations in one company often lead to success in another.

Without the lessons of Napster, we might not have Spotify. Without the trust model pioneered by eBay, we would not have marketplaces like Airbnb. Brian is also the host of the Internet History Podcast and the Techmeme Ride Home Podcast. In the Internet History Podcast, Brian interviews entrepreneurs and engineers who were firsthand witnesses to the developments that led to our modern internet. This includes early employees at Amazon, Tesla and the globe.com.

In his other podcast, the Techmem Ride Home, Brian gives a daily overview of the day's internet news. Through his podcasts about the internet's past and present, Brian has also accumulated an intuition about the future. Brian joins the show to discuss his book *The Art of Podcasting and the Historical Lessons of Technology*. My voice is a little faded right now, but it was not during this interview, so my voice will be delightfully refreshed after this first advertisement break.

Thanks for listening to Software Engineering Daily.

[SPONSOR MESSAGE]

[0:01:52.9] JM: DigitalOcean is a reliable, easy-to-use cloud provider. I've used DigitalOcean for years, whenever I want to get an application off the ground quickly. I've always loved the focus on user experience, the great documentation and the simple user interface. More and more people are finding out about DigitalOcean and realizing that DigitalOcean is perfect for their application workloads.

This year, DigitalOcean is making that even easier with new node types. A \$15 flexible droplet that can mix and match different configurations of CPU and RAM to get the perfect amount of resources for your application. There are also CPU-optimized droplets perfect for highly active frontend servers, or CICD workloads.

Running on the cloud can get expensive, which is why DigitalOcean makes it easy to choose the right size instance. The prices on standard instances have gone down too. You can check out all their new deals by going to do.co/sedaily. As a bonus to our listeners, you will get a \$100 in credit to use over 60 days. That's a lot of money to experiment with.

You can make a \$100 go pretty far on DigitalOcean. You can use the credit for hosting, or infrastructure and that includes load balancers, object storage, DigitalOcean spaces is a great new product that provides object storage, and of course computation. Get your free \$100 credit at do.co/sedaily. Thanks to DigitalOcean for being a sponsor.

The co-founder of DigitalOcean Moisey Uretsky was one of the first people I interviewed and his interview was really inspirational for me, so I've always thought of DigitalOcean as a pretty inspirational company. Thank you, DigitalOcean.

[INTERVIEW]

[0:04:00.1] JM: Brian McCullough, you are the host of the Techmeme Ride Home Podcast, or the host of the Internet History Podcast and you're the author of *How the Internet Happened*. Welcome to Software Engineering Daily.

[0:04:10.3] BM: You can make it sound like I'm a busy guy.

[0:04:12.6] JM: Well, you're not doing them all at the same time, but you are a busy guy, so let's get into that busyness. You have lived through the dot-com boom and bust. That experience was different for you than how books and media have portrayed the early internet. This disparity between how the early internet was portrayed in books and media, versus how you actually experienced it made you a little irritated. This caused you to eventually write a book. What did

the previous writers and commentary people about the internet, what did they get wrong about their histories of the internet?

[0:04:54.8] BM: Well, I would tweak that a little bit. I don't know that they got it wrong so much as when it was happening, there weren't a lot of books about it at the time. There was a lot of media certainly; media coverage of it. It seemed to be this, "Gee whiz. What's this interesting new thing happening?"

A lot of the earliest stuff treats it as this magic that no one's really sure is going to stick and things like that. Well obviously, what has been more disruptive – technology is in every little crevice of our lives now. A, I wanted to do justice to that. Okay, let's reassess, let's see how we got here. Then also it is because well, two-part, I just turned 41. A couple years ago when I would meet with young entrepreneurs they'd be like, "Oh, wow. Dot-com stuff. What was that like?"

Like I always say, you live long enough and the stuff that you actually were there for and remember becomes history. There's so many lessons about the birth of the modern tech era that we're living through that I feel have to be remembered, because they're so valuable for people trying to do startups, trying to do tech today.

Then the other thing was it just bothered me, there's been a bunch of – Brad Stone had a great book about the history of Amazon and this company and that person, whatever. I feel for normal folk, technology is just this thing that comes over them in waves. Like what's this new thing? Should I be on this platform? Do I need this device in my life?

From the opposite side of the fence, I felt a lot of the coverage for mainstream people and history for mainstream people of technology, it's not something that's confuse – It's just an industry like any other industry. I also wanted to write the book from the sense – I was thinking of my dad. Here's how you got a supercomputer in your pocket. Here's why you know what your college roommate had for lunch. Here are the people that did it to you and here's why they did it the way they did it.

[0:06:42.2] JM: You limited the scope of the book to from Netscape to the iPhone. You could have done earlier things, you could have done later things. Then even in this span of time, there

was so much that happened that you had to cut things out. You do cover milestone companies like eBay and Google and Amazon, but you had to cut some stuff. What were the biggest milestones you had to cut from the book?

[0:07:06.2] BM: Actually, I fought hard to save a lot of the dot-com bubble frothy stuff; the pets.coms and things like that. The publisher and my editor, they were sold on the idea of well, here's the true story of how Facebook happened. Here's the true story of how Amazon happened and things like that. They didn't want some of the companies that didn't make it and I fought hard to preserve that.

In terms of what I ended up having to cut out, it was more that I cut limbs, or I cut fat off of the larger stories, because I could have gone into way more detail. If you listened to the early episodes of the Internet History Podcast, where some of those episodes are actually my first draft chapters of what eventually went into the book. A lot of what was lost there was more of the detail, which on the one hand it's great, because all of that detail is still there if you listen to the podcast.

Essentially, what I had to lose was the nitty-gritty, beat-by-beat, year-by-year details. The book it became more of telling the overall arc and how each company contributed to how slowly technology in the web went mainstream and all of our lives. Then at the same time, that's what I learned the interesting process of doing the book, because I've never written a book before. I'm not a journalist. I'm not technically a professional historian.

I would find the actual narrative that I needed in the doing of it, right? It wasn't that well, first came Netscape and then came Yahoo. Then after Yahoo, came eBay, so I got to do eBay next. I would discover in the process of doing it what the real story was. What was the contribution that some of these big names actually made to mainstreaming technology?

The story of eBay, I realized in the in the telling of it is eBay trained us to trust strangers for the first time. eBay did things like create the first online reputation system that where would we have – where would Uber and Airbnb be today without that. I knew I was going to do stuff on Napster and file-sharing. You think, “Oh, well that. I know that story. That's all about piracy and things like that.”

Well, no. Napster was the first blow and the first brick laid to the modern foundation of we live in – In society today, we expect unlimited selection and instant gratification. If you tell me about a book or a movie, I expect that I failed to start watching it within 30 seconds. It was more that I discovered the narratives that each company and each technology advanced to get us to the modern day.

[0:09:39.3] JM: How does Microsoft factor into the history of the internet?

[0:09:42.4] BM: Way more than I thought it would. The startups that I founded were mostly tail end of the dot-com bubble, the dot-com bursting aftermath, so mostly in the 2000s. In that decade, Microsoft's infamous now lost decade where they lost their relevance in the tech industry. By my own experience I was like, well, Microsoft is almost a non-issue and a non-player, especially when you talk about the modern era. Well, now it's back of course. Now it's super relevant again.

What surprised me, maybe it wouldn't have surprised me if I was doing startups in 1994-95, how much each and every company throughout the 90s, everything that was happening, everything that everyone was doing was in relation to Microsoft was can we do this before Microsoft does it? If we do this, will Microsoft come kill us?

It's hard from the perspective of 2019 to – Microsoft is back. They've been thriving, especially the last two or three years. You can't imagine today how in 1994, Microsoft was the technology industry. There was Microsoft, this giant supernova and then there was all these other little planetoids orbiting around Microsoft hoping to survive in Microsoft's wake.

It was illuminating to look back at that time period. We think of the tech – tech has eaten the world now. Something eight of the top 10 most valuable companies in the world are tech companies. There was only one in 1994 and 1995. It was Microsoft. Microsoft was the whole ballgame. It was interesting to realize and remember that that was the case.

[0:11:20.2] JM: Microsoft was eventually scapegoated. The public turned against Microsoft, whether for good reasons or for not good reasons. Has some parallels to today, where

Facebook is getting scapegoated, but what's different today is that there are more companies that could be scapegoated. To some degree they are. I mean, you do see Amazon and Google and etc.

[0:11:44.7] BM: Right. Well, Amazon right now, today, the day we're recording this, they basically been chased out of New York by pitchfork mobs.

[0:11:51.1] JM: Absolutely. I think you would agree that Facebook has suffered the brunt – I mean, or maybe you wouldn't. Do you have any reasons why, I'm asserting that Facebook has been scapegoated more than other companies. Do you have any perception why that is?

[0:12:05.6] BM: Well, I'm going to interject something real quick. In the 90s, the general public did not really care about Microsoft, because again, tech was not in most people's lives, mainstream people's lives in a major way. The people that came after Microsoft that rallied the crowds against Microsoft were other people in the tech industry for the reasons that I just alluded to. Everyone was in fear of them and things like that.

The difference now is that well, Facebook is in everybody's lives, Google is in everybody's lives, Apple is in everybody's lives. That's the thing about telling the stories of these companies is that it's not just telling some boring business history story. This telling stories about companies that touch all of our lives in very intimate ways and every minute of every day.

To get to your Facebook issue, I think that the reason that Facebook is probably getting the lion's share of it is threefold. Number one, it's the one thing that I guarantee you, your grandmother, my grandmother, anyone in North America knows about where – even they might not know that Google makes a phone or something like that, right? It's something that everybody can relate to.

Number two, media people feel that Facebook and Google have eaten their businesses. I'm not saying that there's a conscious axe to grind here, but there's probably some subconscious, or latent jealousy and anger on the part of media people, the people that are writing the headlines and doing the stories towards Facebook.

Then third, look, on the Techmeme Ride Home podcast, every other day it seems I have to do another story about a Facebook scandal. You can say that people are out to get Facebook, but it's Facebook's fault to a large degree. It's things that we can talk about, like their culture, the move fast and break things. Especially doing the daily podcast, I have basically come to the conclusion that a lot of Facebook's PR issues, but also business issues – they're facing a multi-billion dollar FPC fine that it's looking our decisions that they made, things that they did to themselves that they didn't necessarily have to do, the way that they do business doesn't have to be the way that they do business.

Microsoft being a perfect example, Microsoft got into trouble for being incredibly rapacious and aggressive. It didn't have to be that way. Microsoft has changed its culture, changed everything about itself and is as we've been saying, has found success again. I think the third part of it is that it's Facebook's fault for doing things the way Facebook seems to want to do them.

[0:14:36.6] JM: How are startups that are starting today different than startups that got started in the 90s?

[0:14:42.1] BM: The most obvious thing is people know what they're doing now. Not only in the sense that when the web was new, people didn't necessarily know what would work. It was an open question for years. Can you actually build a big business on this technology? Will e-commerce ever catch on? Will people be willing to do business on the internet? Will people be –

Early on, the difficulty was finding if there was a there there, if you're an entrepreneur. Number two, it was a lot more expensive. We live in a world where if you have a great web idea, or a great app idea or stuff, you can off the shelf do things that everything in the 90s had to be done from scratch. There's all sorts of open source. There's repository. You can be like Instagram famously was, or WhatsApp famously was. You can be a team of a handful of people and have a billion users overnight and create a billion dollar company overnight, because you don't have to do things like run your own server farm, or oh, we need an e-commerce back-end? Well, I guess we'll have to spend the next 18 months coding that together ourselves.

All of the tools are there. Then back to the first point, people understand the idea. I think I mentioned this in the book; being an entrepreneur, at least when I was growing up in the 70s

and 80s and early 90s was not a thing. We're used to the idea today of college kids coding up something in a dorm room and it being a billion-dollar company.

If you have an idea now, there are plenty of examples of people that came before you. There's a proven at least path of success that other people have blazed a trail for. That did not exist in the mid-90s certainly. Then when the bubble burst, it seemed like, "Oh, that door had shut but." Now certainly in the last 20 years especially, if you have a good idea, you can see the path to bringing that great idea to fruition. No guarantees a success of course, but at least there's obvious patterns for you to do it, patterns to follow to get you to success.

[0:16:47.0] JM: One historical relationship that you explore in both the podcast and your book is the relationship between hardware and software innovations. Sometimes you have hardware innovations that enable new software paradigms. One example was the small hard drives that enabled the iPhone. Then other times you have software innovations that lead to a new hardware paradigms. More recently, you have deep learning that leads to specific chips. Do you have any favorite anecdotes, or episodes of the podcast that have been perhaps overlooked about the hardware and software dynamic?

[0:17:24.4] BM: My personal favorite arc for that is the idea of mobile computing was obvious to everyone for a long, long time. The PC revolution happened in the 80s. There were people in the 80s that were trying. To them, the next obvious step was well, let's put a personal computer in everyone's pockets. Some listeners might remember that Apple had its infamous Newton debacle.

There were a whole range of startups in the early 90s that I've alluded to as it was a mini-bubble before the dot-com bubble happened. You had companies like Go, General Magic. There was a whole mini-boom in Silicon Valley, venture-backed startups that were all going to bring handheld computing to the fore. It crashed and burned and then the web happened and then everyone forgot about that.

Then there were also all these great people, like of course Jeff at Palm, especially Palm, but then also the BlackBerry guys as well, that hammered away at that idea. It's a combination –

This is not maybe fitting the software part of your question into it as much, but it was just the thing of we know this from technology, sometimes it's just too soon for something.

The Newton failed famously, because it tried handwriting recognition that – Well hey, there you go. There's software that didn't work, that they couldn't figure out. Then it took the iPhone to get input paradigm for a handheld device right. It was also too soon, because you didn't even have 2G in the mid-90s. You couldn't even do data, right? Much less Wi-Fi. Wi-Fi doesn't get ubiquitous until around 2000, 2001 to 2003. You didn't have the first consumer grade digital cameras; didn't come out till 98, 99, as you're talking about the hard drives and things like that.

It's funny because and I've alluded to this – I think I said it on the a16z podcast. I remember for years being told that well, mobile internet is going to be a huge thing. Mobile video is going to be a huge thing. It's one of those things of where AR is. Or sorry, VR is today. Where people have been telling me that for so long that I get jaded and just roll my eyes when I hear it now. Then boom, man. The time was right. It was too soon, too soon, too soon. It's always too soon until the exact day that it's right. Then man, KD bar the door when that happened.

[SPONSOR MESSAGE]

[0:19:54.4] JM: We are all looking for a dream job. Thanks to the internet, it's gotten easier to get matched up with an ideal job. Vetterly is an online hiring marketplace that connects highly qualified jobseekers with inspiring companies. Once you have been vetted and accepted to Vetterly, companies reach out directly to you, because they know you are a high-quality candidate. The Vetterly matching algorithm shows off your profile to hiring managers looking for someone with your skills, your experience and your preferences. Because you've been vetted and you're a highly qualified candidate, you should be able to find something that suits your preferences.

To check out Vetterly and apply, go to vettery.com/sedaily for more information. Vetterly is completely free for job seekers. There's 4,000 growing companies, from startups to large corporations that have partnered with Vetterly and will have a direct connection to access your profile. There are fulltime jobs, contract roles, remote job listings with a variety of technical roles

in all industries, and you can sign up on vettery.com/sedaily and get a \$500 bonus if you accept a job through Vetterly.

Get started on your new career path today. Get connected to a network of 4,000 companies and get vetted and accepted to Vetterly, by going to vettery.com/sedaily. Thank you to Vetterly for being a new sponsor of Software Engineering Daily.

[INTERVIEW CONTINUED]

[0:21:38.7] JM: There are all these patterns that you see if you study the last 20, 30 years of internet technology. Then you'll see them recur, even if you go further back in history. One area that I can't really pattern match to history is the world of podcasting. I really felt in the last couple weeks with the Spotify acquisition, we saw history in the making to some degree. I would love to get your evolved take on that, now that we've had a couple weeks to digest it, or one week. I don't even remember. The strangest thing about that, or one of the strangest things is that Apple had control over the podcasting market for so long. They had complete dominance. It seems like they conscious –

[0:22:27.8] BM: They still do. They still do to a large degree. They're just letting it soak away.

[0:22:30.4] JM: They still do.

[0:22:31.3] BM: Yeah.

[0:22:32.3] JM: Well, but are they letting it slip away, or are they making a conscious decision that they don't want to go into that domain?

[0:22:39.0] BM: Right. Seemingly yes. With Apple specifically, I said this specific thing on the Ride Home just this week that things – the Eero purchase by Amazon, Apple had airport and airport express and extreme. They've seemingly let Apple TV wither on the vine. There's a lot of things. Apple famously is a company that they're almost prideful about the things that they say no to.

Siri being another example, the voice assistant market is exploding and they had the early lead there. Others have caught up with them and are surpassing them, because maybe Apple hasn't followed through. To your point about podcasting, I don't know. On the one hand, I don't want anyone to take over podcasting, because I love it that way. It reminds me of the open web. There are no platforms on audio right now. If you want to do video, you basically play on YouTube's terms and that's the only game in town, right?

If you're an independent creator in audio right now, it's still the open web. It's just an RSS feed man. No one can you from doing what you want to do. On the one hand, I'm glad that Apple podcasting is the way it is now, because Apple has treated it with benign neglect in a sense. I would say, you were talking about pattern recognition. This reminds me of something that I was there for which was the birth of blogging as an industry. What blogging eventually evolved into is essentially modern digital media.

The thing that we used to call blogs, Gizmodo and Gawker and things like that, or all of the people that started as bloggers and are now basically running – they are the faces you see on TV every day and running the Voxs of the world and things like that. It reminds me so much of that ecosystem, where there's a few early pioneers and people are moving the space forward and the industry forward and people are trying to professionalize it and monetize it and industrialize it in the sense that podcasting is still not even a half-billion dollar a year industry. At the same time, all podcasting really is is radio. Radio itself is still a 20 billion dollar a year industry, I think in North America.

In the same way that all that happened is you used to have newspapers and magazines and now you have all of these media brands and BuzzFeed's of the world. All that's going to happen is radio is going to move to inside an app and inside a phone and I think that that's what Spotify sees. Then there's the paradigm of all people care about and Daniel Ek said this in the earnings call, or press release or whatever it was on the Spotify earnings announcement, or the purchases of Anchor and Gimlet.

They want you to spend time in their app. It's how Netflix says their main competition is Fortnite, because what their business is is you spending time with them. There's no reason why audio can't be just as powerful and take up a certain amount of time of a person's day as video does.

Spotify sees that. I don't see why there's not as powerful a business opportunity in audio as there is in video.

[0:25:53.3] JM: Ben Thompson. What key innovations has he brought to writing about technology and podcasting about technology?

[0:26:00.1] BM: Well, the innovation is people have to come along and prove this every now and again that you can be a one-man band, or a tiny indie producer and developer. There's not been a flood of people that have been able to replicate Ben's model. There probably is a whole universe of them, it's just they're in tiny little niches that you and I are not aware of. That's the beautiful thing. You can be a successful indie publisher, producer whatever you want to call it, if you're willing to carve out space in a super targeted niche.

There's probably Ben Thompsons for I don't know, what niche you can imagine. I can't think of one right now at the top of my head. What Ben does that no one else can do is Ben's the smartest MF'er there is though, right? There's not a universe of Ben Thompsons, because there really can't be, because there's not a universe of people that can think about tech as smartly as he does. I mean, Horace Dediu a certain degree.

Oh, you know who's a perfect example of carving out a niche, carving out space in a niche is look at how successful John Gruber has been just covering Apple. Again at a similar way, there's tons of people that talk about Apple, very few that do it as smartly as Ben does. Also Daring – not Daring Fireball, but Beyond Avalon does that for Apple as well, sort of in the Ben Thompson model.

What Ben does that no one else can do is he can analyze the tech industry and industries in general in the Clay Thompson way of this is really smart. Forget the forest for the trees. I can see what's really happening here. I don't think everyone can do that, so that's what makes him unique.

[0:27:35.4] JM: I assert that Jason Calacanis falls into this category also. Yet, he seems to be tremendously misunderstood. What can we learn from Jason Calacanis?

[0:27:45.2] BM: I don't know if you're aware. I had him on the Internet History Podcast once.

[0:27:48.2] JM: I am aware. Great episode.

[0:27:49.9] BM: To tell, right, the whole story of his career. I think I said this to him. He's a hustler. He's a guy from South Brooklyn who was just going to hustle and make it and tells the stories –

[0:28:00.3] JM: In the most endearing sense of the word.

[0:28:02.3] BM: A 100%. Oh, I'm not being pejorative at all. The man made his first business by literally mimeographing a magazine and handing and walking around Manhattan and handing it out and leaving it in places. To this day where he's still doing podcasts every day and the e-mail company that is inside, I think. I think that Jason's insight is – what Jason does that's a little different than what other people do is he wants to do the let a thousand flowers bloom thing. If he finds a good idea, he's like, “Well, why can't there be 10 of these? Why can't I replicate this a 100 times?” He did that with web logs, which he sold in the early 2000s.

One of Jason's things is that he doesn't – and this is to his credit. Again, I'm not being critical about this. He has a great idea. Some people have a great idea and they laser focus on it. Jason has a ton of great ideas. When he has one, he wants to try to apply it in 30 different arenas. One of the reasons that that works for him is that shotgun approach allows him to rapidly test ideas, rapidly iterate and then basically, figure out what what's gotten traction and what works and then hopefully all right, now let's do that and do that and do that, repeat. Rinse, repeat, rinse, repeat. That's what's amazing about Jason to me.

[0:29:23.5] JM: If we fast forward into the future 10 years and then we look back at medium.com, what trends in media will we be thinking that medium.com represented?

[0:29:35.7] BM: Well, when medium came out people were thinking this is a platform play. This is essentially we're going to put all of writing on to a platform, like all the video has gone onto YouTube, right? I think that that misunderstands what it's becoming, which is it's becoming more of a public commons broadcast space.

When Jeff Bezos wants to out the National Inquirer for alleged misdeeds – he owns the Washington Post. He could have done it there. I mean, there's some obvious probably legal reasons why he wouldn't have done it there. He could have issued a press release. He went and did it on medium, because there's something that medium has. Medium is like Twitter. Everyone complains about Twitter not having a character limit and things like that.

I think what people have to understand is that medium fits in the space between Twitter and say, any of the other platforms like Facebook and YouTube and Instagram or whatever, in the sense that medium is more of a place of record and a place where it's like, I have something important to say. I can put it on my website. If I have lots of things to say, I might do my own website, or I might do my own podcast or something like that. If I have something to say that I want to get traction, I'm going to put it on medium where at least built into medium is the potential for virality.

There's a potential for virality on Facebook as well on the potential for virality obviously on Twitter as well. For basically for standing up on a soapbox and being like, "I'm going to have my rant," that's where medium fits in. This is not a small business, but it's a place for PR. There still are wire services that make good money and stuff like that. In a way, medium has gotten the most traction as being de facto, the PR wire service for modern companies.

[0:31:30.0] JM: What is the most underrated attribute of Steve Ballmer?

[0:31:34.4] BM: See, that's a tough question because I don't know that I have a lot of – I have no animosity towards Steve Ballmer. I don't know that I have –

[0:31:42.0] JM: What are your reflections on the Steve Ballmer period as CEO of Microsoft?

[0:31:46.9] BM: All right, if I'll make one criticism and again, I personally find Steve Ballmer to be a charming man. By the way, Microsoft was success. If you look at the actual dollars and cents under Steve Ballmer's tenure, he basically quadrupled or something the size of that company while he was CEO.

My criticism of him was that – would be that he was too much of a team player, too much of a fan of his own team and forgot that Microsoft was a software company, or a technology company. I mean this in the sense that he believed it was a Windows company. I think that one of the reasons that Microsoft had its lost decade was because he's so – he learned too well the lesson that's still applicable, which is man, if you can create your own platform, that's the key to unbelievable wealth and success and power and control.

He believed that Windows was that platform and it blinded him to seeing how different paradigms were rising up and were making the platform that Microsoft had so successfully built completely irrelevant. My criticism of him, I don't think he's a dumb man. I think he sees these – he saw these things coming. Microsoft, they were trying to do tablet computing since the early 2000s. They obviously knew this was coming. I think that he was a little too myopic in trying to fit whatever new paradigm for coming into the existing platform that he had, when again, it's the classic innovator's dilemma stuff.

At some point, he had to make the decision to break his platform, or to abandon his platform, to burn the boats as it were, as Sachin Adela famously and explicitly did. Again, has at least thus far into his tenure had great success doing.

[0:33:32.7] JM: You believe that the 90s internet bubble will not recur. Why not?

[0:33:38.4] BM: Unfortunately, we live in a world where it's seemingly all we can do is run an economy that lurches from one bubble to another. What I mean when I say that is it is unlikely that technology itself will be the thing that will essentially be the bubble. There will be bubbles in technology. There will be froth. There will be times when too much money is pouring into tech companies. The point that I'm making is that the late 90s were a unique period of time, where mainstream Americans were entering the stock market in large numbers for the first time. I don't have the book open in front of me, but there are data points in the book where something like 80% or whatever of people that opened a 401k for the first time did so within a three-year window in the mid to late 90s.

The baby boomers being the largest generational cohort of all time at that point, reaching their peak earning years. All of this money flooding in to Wall Street needs to go somewhere, needs

to be invested in something. Just as a accident of history, the internet happens at that time. All of the explosion, the Cambrian explosion of entrepreneurialism and companies chasing this new technology and trying to see if there is an industry and a market here happens at that exact time.

The fact that tech created a global recession, I feel that's probably not possible anymore, because the tech is too diversified now, tech is everything. Every industry is tech. The thing that can't be repeated in the 90s is that it's not going to just be us in tech that blow up the world, or it's unlikely – I mean, supposedly we could create a killer AI that destroys the world or something. I don't think that you can replicate the exact macroeconomic and financial conditions that were there in the dot-com bubble for lots of purely accidental historical reasons.

[0:35:34.8] JM: Why did you publish your book through a conventional publisher, rather than self-publish?

[0:35:39.5] BM: That is an interesting question. Again, I think my initial – it's freaking six years on from when I had this idea. My initial impulse was I want this to be mainstream. I want this to be authoritative, right? Yes, I could have published a Kindle book, or even a PDF book or something. Other tech nerds like me would have hopefully bought it and read it, but I wanted it to be in Barnes & Noble. I wanted it to be in airports, because I wanted normal people to again, get educated on what the tech industry really is and what technology really is and what it really is doing to our lives and how it did that, right? I've got nothing against indie publishing, but I guess the impulse was that it would give it more a sense of credibility, it would make it more mainstream and hopefully, be authoritative.

[0:36:34.1] JM: The Bloomberg story about the tampered potential servers that was basically debunked, do you think this is going to be historically significant as a really big black mark against Bloomberg, or against conventional media outlets? Or is it completely insignificant?

[0:36:54.2] BM: I don't think. Certainly, it should be any sort of a knock on mainstream media outlets, because let's be honest about it, there are thousands of journalists out there. Some of them either A, make mistakes, or there are famous examples throughout history of actual people making stuff up. What's that movie about? That one guy that fooled the New Republic or

whatever, that Hayden Christensen was in? It's actually a good movie, even though he's not proven to be a very good actor, but shattered glass.

I would say look, it's not a good look for Bloomberg. It's not a good look for those reporters. We might never know the real story behind that, because there's something that tells me that there's some kernel of truth there that either they fumbled or got wrong. There's some reason why the truth of that might never come out. At the same time, it certainly does not look like they got it right. Hey, listen. I do a daily tech news show where I have to read headlines every day and decide what I think is the important stories. Those particular reporters causes me to think twice about their reporting.

That's the point is that that can happen, is you can have certain venues have credibility issues, you can have venues make mistakes. Even as a news consumer, you're free to make those evaluations. Darn, I really loved this reporter, even this magazine. They've been so good for years. Man, they've gotten bad over the last couple years and I don't trust them the way I used to. The ability to discern that just means that you're a sophisticated consumer of news and we all should be.

[SPONSOR MESSAGE]

[0:38:37.5] JM: How do you know what it's like to use your product? You are the creator of your product, so it's very hard to put yourself in the shoes of the average user. You can talk to your users. You can also mine and analyze data, but really understanding that experience is hard. Trying to put yourself in the shoes of your user is hard.

FullStory allows you to record and reproduce real user experiences on your site. You can finally know your user's experience by seeing what they see on their side of the screen. FullStory is instant replay for your website. It's the power to support customers without the back and forth, to troubleshoot bugs in your software without guessing. It allows you to drive product engagement by seeing literally what works and what doesn't for actual users on your site.

FullStory is offering a free one-month trial at fullstory.com/sedaily for Software Engineering Daily listeners. This free trial doubles the regular 14-day trial available from fullstory.com. Go to

fullstory.com/sedaily to get this free one-month trial. It allows you to test the search and session replay from FullStory. You can also try out FullStory's mini integrations with JIRA, Bugsnag, Trello, Intercom. It's a fully integrated system.

Full Story's value will become clear the second that you find a user who failed to convert because of some obscure bug. You'll be able to see precisely what errors occurred, as well as the stack traces, the browser configurations, the GO, the IP, other useful details that are necessary not only to fix the bug, but to scope how many other people were impacted by that bug. Get to know your users with FullStory. Go to fullstory.com/sedaily to activate your free one-month trial.

Thank you to FullStory.

[INTERVIEW CONTINUED]

[0:40:59.5] JM: There is a phenomenon right now where we have all of these different media organizations that we can assemble information from. We have the New York Times, we have the Wall Street Journal, we have the Joe Rogan Podcast, we have TechCrunch. These organizations vary in their degree of unfilteredness, of uneditedness and it becomes quite hard to know who should we be waiting? How should we wait a conversation between Joe Rogan and Jack Dorsey that lasts for two and a half hours, versus the New York Times writing about that conversation? How should we calibrate our balance of truthful weights that we put on these different media outlets?

[0:41:49.5] BM: A little bit. See, that's one of the things. I'm in the minority of this when people are gnashing their teeth about well, who can we trust? Who has credibility and things like that? I actually think that it was a weird world where there were these venues when I was growing up as a kid that's like, well, you're going to trust CBS for sure, you're going to trust the New York Times for sure, because they're CBS or the New York Times.

That's a passive lemming state of affairs that everyone's like, "Oh, the current universe of anyone can have a megaphone. There's no editors. There's no validation. There's no verification." I'd rather live in this world, because that old world, that's a passive media

relationship. That's a passive populace. Now the problem is that because for several generations, we've been taught to be passive media consumers.

It's not easy to just turn the switch and be like, "Listen, now you have to be an actively discerning consumer of media." I think what you're describing even in the way you're framing your questions, I think you should always – I love Joe Rogan. I listen to the Joe Rogan podcast every single week, right? I love the fact that he seems to be an intellectually curious, genuinely curious guy. He's a seeker, right?

Just because Joe – I love Joe and he's proven himself to me, that doesn't mean that I should ever shut off. I should always be skeptical. Every single venue – What you should do for all media is you should actively evaluate them, but then don't stop. If you're like, this venue has proven themselves to me to be reliable, I believe that they're accurate, I like their take, I like the way they do things, fine. Then the problem is that when people talk about people going into their bubbles and you then, well I'm only – some people are only consuming the news that validates their preconceived notions, that's because people shut off. Don't shut off.

Find a venue that you believe. Find voices that you trust. Then once they've won your trust, that's not permanent. They have to earn it every single day, right? The problem is that I think that we don't – a lot of people are not used to and haven't been trained and don't understand how to be sophisticated discerning media consumers. Just be smart about it. Don't be one of the lemmings.

[0:44:22.9] JM: What company has had the most underrated impact on the development of the internet?

[0:44:27.6] BM: eBay. A 100%. I said this in an Inc. Magazine piece; Chris Dixon, and I talked about it on the a16z podcast. Again, eBay is not a company that is in the tech headlines these days much anymore. They don't seem to have impact. No one's making decisions based on what eBay may, or may not do, versus what – obviously with Facebook and Google and the Amazon and that you do.

The three things that eBay did that they deserve way more credit for for laying the foundation of modern technology is A, they taught us to trust strangers online, which forget about it from a

business perspective. Think of it from a sociological, from a cultural perspective. There was a time and I talk about this in the book. For years, when they launched Amazon, they launched it as an e-mail product. Most people were calling and reading their credit card numbers over the phone, because they didn't trust putting their credit card numbers online.

eBay convinced a lot of people, my dad included, you know what? Not only is this internet thing worthwhile, because look, I can get the 1970s stereo equipment that I've been looking for for years now, but I can get it from a guy in Oklahoma whose name I'll never know, whose face I'll never see and actual, real commerce and constructive things can happen with absolute strangers and with crowds of strangers. That's number one.

Number two, as I said, we live in the tyranny of the five-star rating system now. The system of online reputation that eBay developed that allowed eBay to function well, and was in fact one of their great competitive moats that allowed them to be successful. If they hadn't come up with that, again, the gig economy world, the idea that you're going to get in some stranger's car, or sleep in some stranger's house, that wouldn't have happened. We wouldn't have the Yelps. We wouldn't have – There's a lot of social media that is all about upvoting and downvoting and online reputation and things like that. That's number two.

Then number three, this is a business one. We understand this is common now. Facebook owns nothing. Everything that is valuable on Facebook is created by us. Now Facebook is the one that's getting rich off of it, but think of what a bizarre through the looking-glass concept that is, that Facebook is a media platform that owns and produces nothing. It is simply the platform. eBay proved that out for commerce, but also a little reputationally, because eBay was – eBay famously never housed the goods, never took possession of the goods.

By that reputation system, they even outsourced the – verifying that transactions were on the up-and-up and things like that. eBay was we live in a world where there's all of these platforms that own nothing, except for whatever the activity is that its users do inside of or on top of it. eBay was the first company. Not to prove it. They weren't even the first to do it, but they were the first one to prove that was capable at a scale that would be a meaningfully multibillion-dollar business.

[0:47:35.9] JM: How will technology in politics intersect in the 2020 election?

[0:47:40.3] BM: Whoa, boy. I'm not remotely qualified to comment on that one. I would say that is interesting right now, because think of the last several elections. Shoot, I'm old enough to remember how the 2000 election was considered to be the first tech election, because things were happening online and then the blogs in 2004. You had the rise of the Dean candidacy that came from the blogs. Shoot, we have right wing blogs that for a time were running the White House in the form of Steve Bannon.

Also 2008 famously, was the Obama campaign. A lot of people credited their ability to use things like Facebook, to mobilize and things like that. Obviously, depending on what you think happened in 2016, social media had some impact on the election. What I find interesting right now is that all of those things are reactive. It's like, okay, technology is here. Some people are making use of them, but a lot of it like, well, how did technology shape or change?

Look at AOC. I think what we're going to start seeing happening and this is probably nothing more complicated than just generational turnover. You're going to have people that understand how to use technology natively in political ways. Basically, until very recently not a lot of politicians were at all conversant in that. AOC for whatever you think of her, politics or whatever, she is proficient at using Instagram in the way that a very popular Instagram influencer would do. That's not an insignificant thing.

There are people that have 40 million followers and have 100 million dollar careers and things like that, based on understanding how to use social media and things like that. I think that what we're going to see maybe in this election is people that are going to understand how to use that stuff natively.

[0:49:35.1] JM: Are there any trends that you are noticing in the modern internet that you think are underrated?

[0:49:40.3] BM: I think it's underrated. Let me go this way, I think that the way that a lot of pundits and media – or technology analysts have been looking at technology lately has been missing the forest for the trees here. Sorry to use that phrase the second time on the same

episode, but when all of these scandals, these Facebook scandals happen it's like, our data, our data, why does everyone want our data?

I don't think you can comprehend. Tech companies have and they don't want to be – they don't want to publicize this, because they understand that it would make people feel icky. Especially the Internet of Things is happening in the next decade or two decades or so, we're going to be in a world 30 years from now where it's impossible not to know absolutely everything. Every single thing in the world, every event, every item, every – it's going to be a data point that's going to be measurable.

Now that can be good. That means sensors on bridges will tell engineers right before they're about to collapse and things like that. That also is going to mean that – One of the stories I did on the Ride Home podcast this week was Amazon buying Eero. Suddenly, Amazon will have access to all of the data flowing in and out of your house.

The very next story that I had to do was a story about how Google and Amazon are asking, forcing actually Internet of Things, producing companies to do things like every time a user turns on or off their smart lightbulb, let us know. Tell us when they turn and turn off their smart lightbulbs and things like that.

Well again, if everything in my house is telling you everything about me, there are positives to that in the sense that like look, Apple and insurance companies are buying Apple watches for people, because if they can track your health data, they can determine how active you really are and maybe that'll lower your insurance cost, it will lower medical costs overall, because less trips to the hospital, positive things.

Then also, why do you need to know what time I go to bed every night? What can that tell you about me? Well, it can tell anybody anything about everything. When you think of self-driving cars, one possible value – something valuable that could be sold is how often does this household that lives in this zip code go to this particular store? Well, you know who would want to buy access to that information? Hedge funds, that would know, that would have exact to the person data points of boy, it looks like Gap is really in trouble. No one's shopping there anymore.

I think, it's what people are missing is that the real value, the plastics, or the gold, or the oil is what technology – the value of technology is data. It's data about you and right, it's being used to sell advertisements to you and things like that. It's data about everything you do and everything that everyone does. The question is what a world does that make? A more efficient one certainly, you would hope, but also a dystopian one? I don't know. I'm not sure people understand that it's probably inevitable. It's going to be impossible not to know anything. People are misunderstanding how valuable that's going to be for basically every company in the world.

[0:52:56.4] JM: There's a bias to believe that that world will lead us to at this 1984 style dystopia, or this brave new world style dystopia. Why is our public sentiment biased towards the negative futurist outcome?

[0:53:14.4] BM: Well, because it's new. Well, I mean, that's the most obvious knock against any Ludditism. I don't like it because it's new. To be fair to that perspective, which I don't necessarily share – I share it in some specific instances, but to be fair to that perspective, it is up-ending very basic cultural and societal expectations of how culture and society function, where our families exist as these little nuclear independent entities inside of a larger culture, versus everything is going to be meshed together and everything is going to be out in the open.

That is not something that we as incredibly social primates are even in our brain wired to accept. I think people buck against – and are fearful of like you're describing at this 1984 panopticon future, because almost everything culturally and socially, that runs counter to everything culturally and socially that we've been acculturated to expect.

I don't think obviously that it's going to turn out that way, but I totally understand that because that is something that – it's hardwired into us to see a snake and be fearful of it, right? I think that it is hardwired into us to be fearful of people looking in my window, right? That's applicable, even to things like technology, like when I turn or turn off my lightbulb at night, right?

[0:54:46.6] JM: What have you learned about conducting an intelligent podcast interview that you can share with me? Either in this interview, or in your previous podcast experiences.

[0:54:54.1] BM: Well, that presumes that I conduct intelligent podcast interviews. Okay, real quick though, because I have super simple answers for this one. A, be over-prepared. Every time I do an interview, I end up using maybe 30% of the questions that I come up with, because you have to know what you want to talk about. Then don't be married to the things that you want to talk about.

Over-prepare. Have more questions than you'll ever use, so that when you start talking, if you actually listen, good interviews go in the direction that they're meant to go in and that they should organically go in. If you're over-prepared, then when the interview goes in the direction that's this 30% of questions instead of that 30% of questions like you thought it would, you can go too. Over-prepare, listen. Then listen, I've listened to Howard Stern my entire life and his precept is don't stand in the way of good radio. If the conversation goes somewhere that you don't expect, but it's interesting, trust it. Be willing to throw your notes out and go where the good radio is, which is good, interesting conversations.

[0:56:07.0] JM: Why is Joe Rogan successful despite the fact that he doesn't seem to prepare?

[0:56:11.2] BM: Ah, because he's curious. You know what I mean? Because he's intellectually omnivorous. He's always wanting to learn new things. That's a superpower, because it means that he can sit down – as long as you're interesting, if Joe brought on a boring person and by the way, I have heard boring interviews on that show and guess what? I haven't heard those people back again. If Joe can find someone interesting to talk to, again, he's willing to listen because if someone takes him down an interesting road, he's willing to go there too. He's dying to go down that interesting road with whoever that person might be.

[0:56:42.5] JM: What will your next book be?

[0:56:44.2] BM: We are currently shopping a history of nerds and nerd culture.

[0:56:49.4] JM: Fascinating.

[0:56:50.1] BM: I'm not going to elaborate any more than that. It's going to be a history of nerd culture.

[0:56:54.2] JM: Okay. Brian McCullough, thank you for coming on the show and for producing so much useful and high-quality media about technology. It's been really helpful for me.

[0:57:03.2] BM: Well, thank you so much.

[END OF INTERVIEW]

[0:57:08.3] JM: This podcast is brought to you by wix.com. Build your website quickly with Wix. Wix code unites design features with advanced code capabilities, so you can data-driven websites and professional web apps very quickly.

You can store and manage unlimited data. You can create hundreds of dynamic pages, you can add repeating layouts, make custom forms, call external APIs and take full control of your site's functionality using Wix code APIs and your own Java script. You don't need HTML or CSS.

With Wix code's built-in database and IDE, you've got one-click deployments that instantly updates all the content on your site. Everything is SEO-friendly. What about security and hosting and maintenance? Wix has you covered, so you can spend more time focusing on yourself and your clients.

If you're not a developer, it's not a problem. There is plenty that you can do without writing a line of code, although of course, if you are a developer then you can do much more. You can explore all the resources on the Wix code site to learn more about web development wherever you are in your developer career. You can discover video tutorials, articles, code snippets, API references and a lively forum where you can get advanced tips from Wix code experts.

Check it out for yourself at wix.com/sed. That's wix.com/sed. You can get 10% off your premium plan while developing a website quickly for the web. To get that 10% off the premium plan and support Software Engineering Daily, go to wix.com/sed and see what you could do with Wix code today.

[END]