



Episode 15: Gaining competitive advantage from the next wave of digital transformation

Guest: Steve Brown, former Futurist and Chief Evangelist at Intel Corporation and author of the recent bestseller, *The Innovation Ultimatum*, in conversation with Kris Østergaard about digital transformation and the six core technologies that, according to Steve, will transform the next 10 years dramatically.

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Kris: So welcome to the Corporate Innovation Podcast. I'm here with Steve Brown, also known as the Bald Futurist. Welcome to the podcast!

Steve: Thanks for having me, Kris.

1:07

Kris: So, a brief resumé before we let you take the word here, Steve. Steve is the bald futurist and former futurist and chief evangelist at Intel Corporation, where you spent almost 30 years - spent the last many, many decades in high tech. Half of that time in strategic planning roles where you imagined and built plans for a world that is 5, 10 and 15 years into the future.

And now you run your own company called Possibility and Purpose, where you've got companies to understand the exciting potential of technology and have been featured on CNN, BBC, Bloomberg TV, Wall Street Journal, Wired magazine, many other places. And most recently you have a new book out called "The Innovation Ultimatum".

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And so I just got to see the beautiful cover of that book. So if you are listening, let me assure you, it looks amazing! So we're going to talk about all the stuff you talk about in your book about where technology is heading, why there's an innovation ultimatum and what companies must do to navigate the future. But you have a really great, interesting résumé, Steve. So, maybe let's double click a little bit on that and ask you to take us through your journey and take an innovation piece.

Steve: Yeah, I think from a career perspective, I never wanted to ascend the ladder and just do one thing and become a manager and a managing director and on up.

I was much more interested in just learning a lot about lots of different areas. So I was an engineer, a couple of degrees in engineering microelectronics. So, in theory, I can write compilers and design chips, but that's a long time ago and I still had a good head of hair. I was then tempted into the dark side and to go and work in marketing where I discovered that there were more parties and more free cake. And so I spent a lot of time in product marketing, customer marketing, and then moved into technology marketing.

So I literally sat next to the guy who is responsible for marketing USP, which we aren't, and then we'll take for granted in our lives. I was marketing a technology called Instantly Available, which when you open your laptop and it is instantly ready for you to use. You're welcome. That was me and my team.

I mean, those listeners who are not old enough will just think that's always the way it was. But it used to be you would open it up and have to wait a minute or more for it to wake up. So yeah. So a lot of time in technology marketing. If any of you are familiar with Intel and its outreach to developers, I used to run the Intel development forum program worldwide, so that was a big events program, global events program designed to help developers figure out how to use technology.

So throughout this entire thread, I am just fascinated with the impact of technology, whether I was an engineer and figuring out what things I could build customized systems to solve business problems. That was how I first started at Intel, doing technology marketing and thinking about the future of these technologies and the impact they bring to the world running events with thousands of developers and helping to get them energized and excited and given the tools they needed to be successful.

I then moved into internal communications roles at Intel where I learned “How do you tell a good story?”, “How do you motivate people by explaining complex things and technology can be quite complex in ways that everybody can understand?”, so I spent quite a bit of time honing those skills and then that culminated in moving into Intel's labs as one of Intel's two futurists.

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So thinking about the world 7 to 15 years out was the chance that we had when we're in the labs, designing a chip at Intel takes about seven years. So from initial thought of what that chip might be to it rolling off the production line and literally hundreds of millions of units is about seven years. So we'd have to go ahead of that. So I'm trained to think about the world 10 years out.

And when I left Intel in 2016, we were wrapping up the 2025-2026 business plan. So now I'm an independent futurist. I spend my time helping companies big and small to think about what their future is, how they will use all these amazing technologies that are now coming our way and combining them in interesting ways to solve problems for people, whether those people are their employees, to help their employees be more productive, more creative, more engaged in the workplace or to help solve problems for customers in really interesting and innovative ways. So that's me. That's my history.

6:04

Kris: Fascinating stuff. Thank you very much for sharing. Having spent so many years in Intel and having worked with looking into the future. I mean, I guess there's no one really better to ask the question and just get that out of the way. Is Moore's Law dead or not?

Steve: It certainly slowed down a little bit in terms of, you know, every time you go through a cycle of Moore's Law, it used to be you'd get half the power twice the performance. It was just much better every generation. And then that just got harder and harder and harder.

And then it went from initially when Moore's Law was postulated, the initial Moore's Law was every 12 months and then Gordon changed it to be every 24 months. Now we're looking like we're moving to more like a 3 year cycle, maybe even 4. But we're still getting better fits. It's not done yet. We probably have 4 now where it's 10 to 7 nanometers now.

Different companies measure what they're producing in different ways so that, you know, some of them are kind of equal. Even though some people call seven in 10, we're probably going ahead to 5 and then maybe 3 and 3, maybe the end of the road. But, you know, there are more technologies that come behind that.

There's all sorts of interesting new technologies, photonics, centronics, and the quantum way of time. So Moore's Law, in terms of shrinking on silicon may be slowing down, but there'll be technologies behind that that will keep things going and keep things interesting for us all.



7:52

Kris: Right. And technologies. We're going to talk about that in just a few minutes. But before we sort of head to that, the title of your book is called "The Innovation Ultimatum". Tell us just the headlines of it. Before we deep dive into all of this stuff. What is the innovation ultimatum?

Steve: Sure. So the innovation ultimatum, I think, has two main components. The first one is probably the most obvious, which is the competitive automation, which is that if you don't disrupt your own business, then a competitor is going to. There are a suite of very powerful technologies. So the subtitle of the book Innovation Ultimatum: How Six Strategic Technologies Will Reshape Every Business in the 2020s. No business is immune.

And these six technologies are going to change the competitive landscape. So there's the first time the ultimatum is kind of innovate or die. The classic idea there. The second part, which I think is as powerful, is the moral dimension to that, which is especially if you're a purpose oriented, purpose driven company where you have a strong humanistic purpose. These very powerful technologies can be used to solve problems for people.

And so the moral imperative is to use them in ways that improve working conditions for people, and make their jobs more rewarding. Remove dangerous, repetitive work and automate that. But also to use those technologies and combine them to do good things for people, whether that is improving health care, making education more accessible, creating exciting new products and so on.

So those are the two pieces of information to make to the structure of the book. The first third of the book is going through each of the six technologies as a chapter per technology. So those technologies, by the way, are artificial intelligence, blockchain technology, augmented reality, autonomous machines, the internet of things, and then next generation networks of 5G and satellite constellations.

It's just going through what those technologies are. Explain them hopefully in a way that is accessible to everybody and then talking to leaders about why those technologies are important. There's lots of interesting examples about how these technologies ought to be used to solve problems. Second section is some general thoughts on what these technologies will mean for business. There's a chapter on the future of work, a chapter on the philosophy of automation. Chapter on the value of data.

Then the final third of the book is a chapter spent on each of the major industries and how these technologies are already showing up to solve problems in their sectors. A chapter on health care. Chapter on real estate and construction. Chapter on manufacturing. And so on. So that's the



book. Hopefully it's gonna be a useful resource for leaders who realize they need to keep up on this stuff. But because they're busy running a business, they don't have the time.

10:53

Kris: Yeah. And I really enjoyed reading about the technologies and where you see them heading over the next 10 years. And I mean, I spend my daily life as an educator in this field at Singularity University. But nevertheless, I thought there were a lot of interesting new insights for me as well.

I'm sure there will be for any reader and I would love for you, and that's like an almost impossible task here is to ask you to share what you were most excited about here. I mean, obviously, which you also state is that all of these technologies are going to be absolutely important, pivotal for any business development over the next 10 years.

But what when writing, researching, etc, what really got you excited and where do you really see the big importance? The big potentials? The big "This is what you got to look out for"?

Steve: Yeah, that's a fair question. You know, I named my company Possibility and Purpose, and the idea behind that is to look at the landscape of possibility and then use your corporate purpose because there's so many things that companies can do with all this cool stuff to figure out.

Given our purpose, what are we going to do? What are we gonna focus on? And as I was researching this book, it took me about two years to research and write. Even as a futurist, I'm used to living in a world where a lot of stuff doesn't faze me. Yeah, flying cars are coming. No big deal. We can talk about it a bit later.

But there were still things that I discovered and I thought, holy crap, really? So, I'll give you a few examples. And a lot of them come when you take not just one of these technologies, but two or more and combine them because you get a multiplicative effect. So one example is this project called super sensors. We are taking a sensor and turbo charging it with AI.

So there is a company in Israel called Beyond Verbal. They are using artificial intelligence to analyze what they call vocal biomarkers, a particular sound in your voice that are indicators for diseases. So they are or they have been through clinical trials, they do some partnership with the Mayo Clinic, a very respected medical institution in the United States, and they have already successfully been able to demonstrate they can hear COPD, sleep apnea, chronic heart failure and coronary artery disease in the sound of your voice. That's mind-blowing.

And they're in trials now and they're optimistic that they will also be able to hear diabetes, hypertension and even cancer in the sound of your voice. And to be able to, I mean, diseases like cancer, early detection is vital. So to be able to have a device in your home, you know, your Alexa

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or whatever it might be. I'm sorry if you're listening and I just got one in my home to wake up to, to be able to have your voice constantly listened to and monitored, and to get you to treatment early is a massive breakthrough for humanity.

So those are the side types of things that really caught my attention. There's also some work going on at the MIT Media Lab. Dr. Dina Katabi is doing some great work. She's a great TED talk on this topic as well. They're using what is essentially a low power Wi-Fi hot spot on the wall. It's a radio frequency sensor. It sends out radio frequency waves and sees what bounces back.

Radio frequency waves tend to go through walls that bounce back off people. And they use that to be able to create essentially a camera using radio frequency. So they train the A.I. to be able to draw information from the signals that come back. They can see people, they can figure out where those people are walking, standing, sitting this week in the dark and through walls. So it's a way of creating a camera that is not a camera and it's being taught.

If it's sounding creepy to you, listening out there, yeah, it could be. We have to think carefully about how we use this very powerful technology. This is a technology they're aiming to use an assisted living facility for older people where you want to keep an eye on them.

You know, if they fall down and can't get up. You want to know that and send someone into the room to help them. So to be able to have a sensor in their image is a sense and not a camera. The consensus they've fallen over, very powerful. This sensor does more, what they found was the A.I. was so sensitive it was able to pull out from that radio frequency signal that was bouncing back off them and read their heart rate and their breathing. So now without wires on someone, I can read their heart rate and their breathing rate.

It can even read their sleep state so they are awake and they are in deep sleep, REM sleep and so on. So the reason you want to know information, the reason I told you this long, winding story here is that all of those things are indicators of health care conditions. If you have disruption in your REM sleep and you take repetitive motions when you walk around the room, that is an early onset Alzheimer's indication.

If you have disruption in deep sleep, that's an indication of depression or anxiety. If you have the issues where you are changing your gait, the distribution of weight as you walk, that is an indication of early onset Parkinson's. So AI can decode all that information from a simple essentially a Wi-Fi hotspot based on the wall.

To me, that kind of stuff is incredible because we think about AI as you know, it's going to power robots and drive our cars and all the things we read about in the press. We haven't thought about AI as a lens through which we can see the world more fully. And I think that notion when it struck me really brought it home to me. We think about AI as powering machine vision so that machines



can see the world. I think AI has the potential to allow us to see ourselves and the world in all its beauty and intricacy in entirely new ways. And that's exciting to me.

17:25

Kris: Yeah. And here, it also becomes relevant to start talking about augmenting yourself, right? This whole transhumanism movement, etc., which we may have time to get into a little bit later as well.

I'm very curious to sort of get your picture here, because, I mean, these are very big technologies, right? AI, Blockchain, 5G, IoT that are going to transform all the infrastructures, all the processes in our organizations and in our society as well. Paint a picture for us here on the supercharged highly successful company 10 years down the road in 2030, that AI, blockchain, 5G, IoT powered. What does that company look like? How is it different from what we see today?

Kris: Yeah, that's a big question. I'd think about that a little bit. So let's figure out together as we go along. You know, what are these technologies going to do for us? Well, I think the big picture things, we can expect more impact from technology on business in the next 10 years than the last 40. There are some people saying more in the next 10 years than the last 100. So buckle up.

So how might that show up? Well, for starters, satellite networks, satellite constellations and 5G in cities around the world is going to turbo charge people's ability to get data and 5G networks for the first time designed not just for cell phones, but for devices, for connected things, so 10 years from now we're gonna be in a world of 100 trillion sensors and 100 billion devices all connected online.

And those satellite networks are going to make the Internet accessible, the web accessible to the next four billion minds. So a big successful company in the next decade will now have a market of 9 billion people that they're aiming at because the potential of all those people who are connected in places that have not been possible to be connected before, they're going to be accessing data, drawing data from those hundred trillion sensors.

Understanding what is happening in their businesses and with their customers and in the world in real time and using AI to control that data and make informed decisions or to make recommendations to humans that can make better informed decisions as a result.

They may well be distributed businesses creating distributed value by using blockchains to build businesses and completely new ways, businesses that are almost all semi-automated by the fact that governance has been built into the structure of the blockchain platform that's been set up.



Certainly I think by the end of 2030, the smartphones that we all carry in our pockets and purses and that have become a primary way of interacting with digital information services and with each other give way to augmented reality and we're going to be wearing fancy glasses and digital information services will just be part of the world that we experience.

They'll be everywhere and they will just merge in with the physical world. So we're not walking down the street bumping into things because we're looking at this rectangular screen in our hands. Now, it's just part of the world around us and moving and have control over that and decide what we turn on and turn off.

So we'll have customized views of the world. And I think brands, companies that recognize that early on and take advantage of that the same way that brands and companies that recognize the shift to mobile and were quick to come up with apps and a strategy around mobile were successful.

So the success that will come in 2030 would have embraced augmented reality in the same way. Depending on the business, they may or may not have a need for autonomous machines. Let's say they do, and they embrace and they use them to project their brand offerings.

So people often think about self-driving cars as a great way to get people from A to B. But they're also a way to project a brand's offerings and take them to people, so rather than bringing people to you, why not create mobile premises that can push things out there and that there are companies already doing trials with using autonomous platforms as a way to deliver services to people.

So in China, they released their alpha platform and Shanghai is a fully autonomous mobile store. You summon it with an app, it trundles through the nights to you. You open the door, you get on, you buy what you want when you're done, you pay with your phone and it moves on to the next customer. So I think that may be a significant component of the business of the future. I think I covered all six of the technologies there so just a flavor of the type of things people should be thinking about.

But fundamentally, I think the most successful businesses of the 2030s may not exist today or they may be very small startups today because they may come into being in a very distributed fashion, perhaps using a blockchain platform. But I think they will be successful and they will differentiate themselves from their competition by using data to make every decision that they make.

And that's going to be the transformational game for established companies today over the next number of years. One of the things they have to look at is to look at all the decisions that all of their employees make and track what essentially is being made using data and what essentially,

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still, using the gut, the human gut. Which of those decisions do you want to start making raw data and then what data you have?

23:40

Kris: Sorry for interrupting, I had thoughts around that - both automation and level of automation and the role that AI will play in organizations that I definitely want to get back to. It is really, really interesting stuff. And maybe before we get to that, these technologies, you covered them all and one of the technologies where we see most skepticism around industries is blockchain or blockchain technologies or I don't even know if that is the right terminology or it should be distributed ledger technologies or whatever.

Talk a little bit about that. Because many people I meet are like, yeah, we know and we know it's early days and maybe eventually, but the hype is sort of over, right? What do people and organizations need to be aware of here in regards to blockchain technologies?

Steve: Yeah, I think you're right. Those criticisms have been fair. Blockchain was hyped and a lot of people link blockchains with cryptocurrencies and bitcoin and so on. I personally think cryptocurrencies in and of themselves are very boring.

Blockchain is a platform to build trust and to build distributed value is fascinating. Blockchain has been around for almost eleven years now. So it's starting to mature as a technology. And I think if you looked at blockchain a few years ago, you would rightly conclude it was not ready for prime time. As a technology consumed way too much energy, it didn't have the speed that was needed for some enterprise applications. That's now changed. And as we move away from actually blockchains into these new dags and other formats of these platforms, they've started to become competitive and to be really interesting.

So why would you need a blockchain? Do you need one as a company? The answer is maybe, but maybe not. There are some organizations that will not benefit from them at all. But if you're exchanging value or you're helping people to exchange value, in some ways, especially if you are looking to shift value between strangers, blockchain can be interesting. If you're looking to create platforms which are highly distributed that reward people in new ways, that are decentralized platforms, it can be really important to look at. So blockchains kind of got a bad rap and I would say that was fair 3 or 4 years ago, it's less so now and is worth taking another look

26:22

Kris: So moving on to looking at the companies out there and what kind of strategies they should be thinking about. You open the big questions. What is the future you want to build? What is the future you want to avoid as the two core questions that organizations need to ask themselves in



order to figure out where to move into the future? Maybe you want to unfold that a little bit for us. How to go about exploring those really interesting and really difficult questions?

Steve: Yeah. I must give full credit to my old colleague, Brian David Johnson. Those were his two questions that he used to ask when we were at Intel together. And I think that the two fundamental powerful questions and I encourage people as they're thinking about these questions, to remember that the future isn't something that happens to us. This is also something I learned from Brian. The future is not when it happens to us. The future is built by people working together. And typically people working together. That's called companies inside corporations.

So, you know, everybody listening, I call myself a futurist, but you're all futurists. I deputize you all. And to be a futurist, you need to ask these two fundamental questions and ask it in your own context what it means for you. So what is the future you want to build? And the emphasis there is on you. What are you going to do, right? And that means you have to become savvy in all these technologies. What they can do and what they can't do and then decide what am I going to spend my time doing, what is worthwhile to me. And very often, if you're working inside a company, that means looking at your corporate purpose, looking at your mission and figuring out how could we fulfill that mission more powerfully? How can we empower our people in our organization to fulfill this purpose more powerfully by supporting them with these technologies.

So it's not just what's the technology infrastructure I want to build, it is what is the change you want to be and see in the world and how can I use these incredibly powerful tools and technologies to support people working together to make that happen? Now, that's the first sign of it.

The second side is what's the future you ought to avoid? And we all know about the unintended consequences of technologies. And technologies are neither good nor bad. They are benign. How we choose to use them is what matters. And even if we didn't think ten years ago, when we were talking about social media, that maybe it would be something that had to be regulated.

And yet here we are with disinformation, rife and bullying and all kinds of problems on social media. It seemed like a lovely technology to bring the world together and help us all connect and see, you know, friends, babies when they were born. It still can be that. But other things have happened. So it is important to think upfront in a rigorous way about, OK, this is a wonderful piece of technology you're going to build, it is incredibly powerful. Well, when you build something incredibly powerful, it can be used for incredibly good and incredibly bad.

So there's a technique that I have used many times called science fiction prototyping where you write a story and you take your technology, your experience that you're building, whatever it might be, your product and you imagined the worst possible things. We go to a really dark place if you can drink whiskey while you're doing it, it's better, I promise.

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And you think through, what horrible thing could happen? This is the first act of the story. The second act is how would you detect that horrible thing has happened or is happening? And then for the final act of the story, how would I mitigate that? How do I stop it happening and fix it and put things back, put things right.

The reason that you do that and the reason it's called science fiction prototyping is you're going out in time and imagining what happens when this thing I'm going to build is everywhere. It's normal and it's a normal everyday use. How might people abuse it?

It's almost like pressure testing your idea and helps you to figure out what are the holes in it that I can guard against and plug the holes before I let this thing out into the world. So that's in a very short term way. That's how you think about what's the future I want to build? How do I support people with technology to make that happen? And what's the future I want to avoid? How do I pressure test testing and wring out that idea using science fiction prototyping to make sure to inadvertently create something awful?

31:15

Kris: Yeah, I find it fascinating to actually add that dimension to not just what is it we want to create, but also what is it that we want to avoid. And then as you say, you have to go to a dark place here. And then there's, of course, some problems building into this, right? Which is sort of the limitations of the human brain and our inborn tendencies to think very linearly. And the difficulty of really challenging ourselves and to understand really what all of these accelerating technologies will enable us to win in X number of years.

And the other thing is that, I read somewhere and I can't remember who said it, that it typically takes a generation before you understand what the impact of a technology was. And so could we really have foreseen what social media would be like today, you know, 10 years ago? 15 years ago?

So what are your thoughts in actually when running these science fiction prototyping workshops, how do you actually ensure that you don't want to project too linearly and that you really are able to unfold those potential landscapes? That, of course, can be radically hard to imagine because they in many ways show or end up being lives that are very different from the lives you have 10, 15, 20 years before that.

Steve: Yeah, I think it is difficult, but it's still worth a trial. And if you get 50 percent of them, but you missed 50, at least you got 50 percent, that's a good start. So just because you get them all doesn't mean you shouldn't try. My old colleague Brian David Johnson had mentioned a couple of times. He runs a threat casting lab at Arizona State University. And if you're interested in looking



at the dark side of technology, you very often need to bring in professionals who do that for a living. And he works with the army cyber core, with security professionals, with the CIA, FBI. So I've been in one of your sessions and they get pretty dark.

But these people are trained to think in that way and to take things to those conclusions that if you go to a threatcasting.com, you can actually go in. And all of the reports they've done on AI might be weaponized 10 years from now, they're all up there to download for free. So sometimes, you know, you have to surround yourself with people who are able to go to those dark places. And the reason that they do that is not because they're morbid people. It's because they know that somebody has to do it's kind of dirty work.

34:55

Kris: Yeah, and one of the things that I really love is, how throughout the book, you go back to the notion of purpose and how do you align your different technology strategies with your pick of purpose. And you're talking about aligning automation strategy with your purpose and your AI strategy, etc., How do you actually do that?

I mean, one is I mean, this is why we're here. This is the world that we want to see. And then there's automation, which in many ways is something like very concrete that processes more customized offerings, etc. How do you create that link? How do you build that bridge?

Steve: It's a fine question. So let's talk about another bridge first. It's the bridge I took about in the book, which is the bridge between the digital world and the physical world. And we have been building that bridge for decades now. But in the next 10 years, we're going to connect those two sides, the digital world and the physical world that we live in in a much more intimate way.

Much more value can stream across that bridge from the digital world into the physical world. And in part, that happens because we deploy those hundred trillion sensors into the world, sort of the digital world understands what is happening in our physical world and can act upon it in real time, which allows us to sort of semi automate life processes so that, you know, the world just becomes an infrastructure becomes more responsive to human needs.

So some ways to think about that in the book I talk about an optimization hierarchy is if you're creating a sensor and switching something on, something off to respond to something that's happening in the world. It's what's called a control loop. So, for example, a sprinkler in a park, you know, I can switch it on and off like clockwork on a timer. But if it's rained that day, that's kind of a waste of resources. So if I have a moisture sensor on that and then the ground is already moist, then I wouldn't switch that sprinkler onto that day. I've optimized for the use of water in that example, so I'm optimizing for resources.



But one of the things I propose is that as these technologies get more powerful by using these hundred trillion sensors and incredibly powerful and over time incredibly cheap artificial intelligence capabilities, we can start to optimize for higher level ideas so we can optimize resources like energy or time, labor or water. But you could go higher. You could start to optimize for quality output on a production line. You could optimize for efficiency or profit. You go higher than that.

You can optimize to make your business more responsive, more agile, more flexible. You might optimize for sustainability. You can go higher still. You know, maybe I want to optimize for human health. And then this starts to get into the purpose side of what is the purpose of my organization. Why do we come into work every day, it's not to make money - that's a result of executing against that goal, corporate purpose. But maybe I'm optimizing for the safety of my workers. Maybe I'm optimizing for my ability to help people get around easier. And then you can go right to the very top, which is thinking about the human side of things.

Maybe I can use all this technology to optimize for human connectedness, for creativity, to boost the humanity of an organization, to boost happiness. I mean, think about an organization like Disney, right? They are in the happiness business. How could they use all these technologies and combine them in that same park to optimize for the happiness of the children in that park? You make the children happy. You make the parents happy. That's an easy equation. So I encourage people in the book to work their way up.

The hierarchy set their goals high because in the past we've focused on low level stuff, productivity and efficiency. And we should still work on that. But these technologies are now mature enough that we can start to lift our heads up and think about higher level things to optimize for surprise, building awareness in the world, delighting customers, sharing information to more people. There are things that we can do which better align with the reasons we actually get up in the morning and are excited to go into work.

39:38

Kris: And what does that mean for the people who need to be involved in this decision making, research process and decision making, etc. to actually get to that where we have those discussions around? Are we automating for a bigger purpose? And then. Is that you start from the top and it trickles down or is it a bottom up process or both? And or what do you focus on?

Steve: Yeah, my gut tells me we have to do both at the same time. You know, you're going to get a certain budget to go work on stuff. You better continue to deliver some short term wins, lower down that hierarchy, but set your goals to try and get some rest, get some stuff done higher up because you have to demonstrate to your management team, your leadership that the stuff you're talking about or, you know, optimizing for happiness or whatever it might be, you know, it's not.

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The sky stuff. This is really achievable. So stop pushing your way up the hierarchy and demonstrate that you can deliver high level business results and you will get rewarded for that. Right. High level business results are worth a lot more. Which means you, if you've excellence against them, are worth more to your company. But I think you have to get the short term wins, lower down the hierarchy and then maintain that effort to try and move your way up.

41:03

Kris: And so, you also I mean, digital transformation is at the core of your book, right? And our information sort of part of that and all the different technologies that you mentioned as well. And you also talk about how to build a modern culture of innovation. It's a theme very close to my heart. I've written a book about it as well. And it's obviously very close to many, many people's hearts who work in this every day, who live this every day, and who have to sort of try and figure it out in both small and medium sized and large corporates out there.

What are your experiences? Is absolutely core here, maybe also drawing upon experiences from being in Intel, which by all measures is and has been one of the most innovative companies around ever.

Steve: Yeah, I think it comes down to communication, permission and reward. And you know, you have to communicate very clearly to your teams. That you expect them to aim high. You expect them to take risks, that risks will be rewarded. That, you know, this is our mission. This is our purpose. This is our vision for the way the world could be.

These are the steps, the strategies we're going to take to execute against that. Just be really clear on the communication and sitting people down once a year and saying that is not clear communication. It's got to be part of everything that leaders do. They have to say over and over and over again and give people confidence that they understand and are aligned with where the company is going.

Second, they have to be given permission to try new stuff. That means that leaders have to be willing to reward failure, to stand someone up and say, you know what? I told this person to take a risk. They took a risk. It wasn't a dumb risk. They went into it eyes wide open. They knew the chances. They knew that potential rewards. They did everything they could to mitigate the downside. And they did it and it failed. But you know what we learned from it? This is what we learned. And we should be trying this kind of stuff.

Give that person an award in front of their peers and show them that that's OK. And then reward successes. When you get successes, it's the successes that everybody's and link those successes back to the purpose. Back to the mission. So, you know, we achieved this today. All of



us working together. And this is why it's important, because this helps further our mission, our purpose in this way.

And keep that loop going and, you know, reward creativity, reward all of the skills that are needed to drive innovation forward and do it in a very visible and systematic way. And that was something that I think Intel did very well. They would always reward people against the corporate values and do it very publicly so that it was understood. If you behave in this way, even if you don't get the result you'd hoped for always, you will get rewarded. And that's vital.

Kris: Do you have any concrete examples of how that has been done at Intel? I believe, for instance, one of my favorite cases is, at least I know some people in Google that have applied, they hand out what they call the Courageous Penguin Award, which is like, you know, the penguins, they stand on the edge of the iceberg, right? And who's gonna jump first? They don't know if they hit ice or water.

Hence the courageous part and took that principle and awarded it to someone who, not based on a resolve but daring to do something, even though they don't know how it turns out, right? So I think that's a great story. Do you have any stories like that from Intel or other ways of sort of highlighting the important thing that isn't most items sold or these sort of obvious successes?

Steve: Yeah, I'm trying to think I mean, it's been a while since I was there and a lot of examples were from a couple decades ago. But I mean. The guy behind USP, he was just one guy that came up with the idea. And he's so passionate about it. You know, he pushed it and he pushed it and he was told, you're crazy. Are you sure? Can we do this? Are we in the position to build, drive this? And eventually he convinced the leadership to get behind him and Intel pushed it and drove it into the marketplace and it became a global standard.

When that happened, he was rewarded inside the company. He was even included. It wasn't an actor that played him, it was him, he was put into an Intel commercial as a result. So he's kind of a hero inside the Intel element. But there, you know, there are many people who make lots of big things that consumers would never know about. There are a couple of guys who almost single handedly went and figured out how to build a supply chain that Intel could guarantee did not have conflict materials in it.

And that had not been done at the time and was thought to be almost impossible. But Intel pioneered the way and it was two people that really did most of that work. They had a small team that supported them, but they got rewarded and held up as heroes inside the company.



46:36

Kris: And it is always interesting also to learn, I mean, there is this myth around Silicon Valley, right? And maybe not so much now as even just a couple of years back. And one of the reasons, of course, is that we see more and more ecosystems around the world that are challenging Silicon Valley's status as the number one innovation ecosystem of the world, even though it still is very special.

But it's always interesting to learn also from the Silicon Valley companies that even in those companies, you know, it can actually be a real journey to get something to happen that is new. And that is sort of challenging the status quo, right? It's a common thing, even across any type of organization.

Steve: And the big challenges ahead of us know, creating the next breakthrough products and services, solving the big human challenges. They're not easy problems. And the only way they'll get solved is by increasingly diverse groups of minds working together. And that's going to take a level of collaboration that we've not seen before, but also a level of empathy and respect between disciplines that we've not seen before or it is difficult. And that's one of things that, you know, you talk about Silicon Valley innovation, seeing experienced designers, social scientists, ethnographers, culture anthropologists, try to work with engineers back at Intel.

10 years ago, that was almost impossible. They couldn't understand each other and they had very little respect for each other. You know, a cultural anthropologist would think that an engineer was very, very mildly ascended from an ape, just didn't have, you know, much in the way of social graces, and didn't understand the world. And conversely, engineers, why don't these social scientists understand hardcore engineering and the realities of it all? And not only could they not understand each other's language, they just don't have any respect for each other. So in order to solve the big problems of the future, diverse groups of people from very different disciplines are going to have to work together. Think about a self-driving car. That's a huge effort. But you're not going to have to have ethicists, people understand ethics, talking to A.I. engineers. We're going to have to increase people's ability to understand each other, to communicate with each other and to have respect for each other's disciplines and expertise and that.

49:17

Kris: And there's another dimension to this right, which is to the diversity and the need for diversity, which is AI and you talk about it in the book, the notion of AI as your partner, AI as your subordinate, AI as your boss. I mean, where are we heading? Where do you see that we are heading and slash where we need to be heading in regards to the human artificial intelligence collaboration or where we meet each other in the hierarchy and how that will pan out.



Steve: Yeah. So that is something I spend quite a bit of time digging into the book and thinking, how will the workplace of the future be different when you're combining humans and machines working together?

Now you can think about robots working with humans, that's a fairly easy construct to understand. As you know, either the robots replacing the human or it's working in partnership with the human. About 25 percent of all robots in the future are thought to be Cobots, collaborative robots designed specifically to work alongside a person and do the repetitive work that the human doesn't want to do or to do the dangerous work that the humans should not be doing.

So that's fairly easy to understand. It gets a little grayer when you start to think about how an A.I. is going to work alongside a human. And it's going to change our relationship with tools forever. So if you think about a hammer, if I pick up a hammer to knock on a nail, the hammer doesn't really have much to do other than just be there and be able to hit the nail. I'm actually hitting it with my hands. I put the hammer down and the hammer doesn't do anything more until I pick it up again. It's completely subordinate to me.

With an AI, and there is a whole class of eyes that are being developed that I would call collaborative AI's. They are designed to work in partnership with us, to be our teammates, to add value, to help us be more creative, to help boost our intuition and other things. We're going to look at them not like a hammer, but more as a teammate.

So MIT collaborates with us and we're gonna have to get used to the idea that, you know, a high functioning team of the future, maybe a collaboration between humans and machines working very closely together. So my guess is most of the people listening to this podcast, 10 years from now, you'll have an AI helping you one way, shape or form to do your job and do it better, and not just to get more done in the same time and be more productive. Yeah, it might help you do that. But my hope is and all the evidence I'm seeing so far is that it's going to help you be more creative, help you boost your intuition, help you make high quality decisions, help you enjoy your job more.

So there are some people who are going to be displaced from the workplace by AI and robots and we have to figure out how to help them get back into the workplace. For the majority of us, we're going to enjoy coming to work more often because we're working in partnership with AI that will take on the tasks we want to do and help us to do our jobs.

I'll give an example from the engineering design world. Autodesk has created this category of products called generative design, using a particular form of artificial intelligence called generative art, adverse to certain networks to create an AI that can take a design that a human designer has created and then reformat and create hundreds of thousands of variants.



So the partnership between the engineer and the AI is they're able to create a design together that neither would have created alone, but it is better they would have created.

Kris: What is it that the AI needs the human for in this example?

Steve: Well, the human is setting the parameters for what this design should look like, its size, its shape, what its function is going to be. They may actually design the very, let's say you design industrial valves, you might design that valve and then put it into the CAT system and then say, OK, here's your parameters. Here's my initial design.

Now reformat and show me what other ways this design could be achieved. So the human is starting the design off, the AI then comes up with two thousand other variants and tests or those variants inside simulations. So it can then map them out and say these ones over here, these are lighter weight than the original design. These ones are physically stronger. These ones are cheaper to make. And then the engineer can look at that design space and take the design that they think is the optimal balance of physical strength, weight and cost, for example.

So when Auto Desk piloted this stuff with engineers, they were expecting that the result would be while the engineer is going to create more in the same time. And that was true. They found that was true. What they were surprised by was the engineers reporting back to them and saying this makes me feel dramatically more creative than I ever could have been in the past, because instead of looking at creating three different designs and picking the one I like most, now I can explore hundreds of thousands of designs and come up with way more creative designs that I would never would have gone to without this tool.

So that was a real revelation from the beginning of this. And what were the big surprises for me? That was a big one that, you know, this is my first example of what I'd hoped would be true, which is that AI's are not just going to make us more productive so we can get more done in the same time, which, you know, we all feel like we're running on a wheel and, you know, in the rat race all day long. But actually, to make us feel more liberated, make us feel more human and boost our own humanity by amplifying that creativity.

Kris: And so what about robot managers? I'll share with you, I literally saw this today. It's a fairly new study put out by Oracle and where they ask globally more than I think 800 people, so a pretty big study, a bunch of questions about automation and working with AI and asking people if they would prefer a robot manager. And it's a pretty, I think, striking result here. The global average is that 64% percent of respondents would prefer a robot manager over a human being.

Steve: What does that say about people's love of their managers today?



Kris: Oh, that is that that's a lot, right? There are really big cultural differences. India is number one, 90% of Indians answering the survey prefer a robot manager, whereas in France, U.K., U.S, it's about 50%, which is still I mean, a lot I would say. We actually did a similar story about 3 years ago where we asked people's openness to work for or with what we call objective computer systems.

And then we found that about a 1/3 of Americans would prefer an AI as a boss. Whereas in Denmark, where I'm coming from, it was like the complete opposite. I mean, more than 80% were like no way, never. I'm sure there's a correlation here between happiness at work in general, right?

In the Nordic countries, there's this, people generally like going to work, which is not necessarily a thing around the world. So that I'm sure will impact it. But it also says something about, it suggests a real openness to the introduction of artificial intelligences in work. Not just in the collaborative space, but even to the thinking of having an AI being your boss, telling you what to do. I mean, we are already seeing it in the Amazon warehouses, although they claim that there are still human beings who are deciding whether people get laid off or not. But what's your thinking on that?

Steve: Well, it kind of makes sense. I mean, the old adage that people join companies and leave managers reinforces that. And if people have good managers, they stay. If they have bad managers, they can't wait to get out. So all you managers out there buck up because the AI may replace you, because your employees may prefer to work for an AI than you.

Now, that said, I think you have to tease apart what are the functions that managers provide. And it varies depending on the industry and the jobs. But, you know, part of it is organizing the work, deciding who does what, when, making sure they get it done. Task management, that for sure. You know, if you have a bad manager that's not good at doing that and treats you poorly, you'd rather that was done by an AI.

But there are other things that managers do - inspiring their teams, coaching and personal development, developing their teams to be better. Those things, I think those can be best done by a human. Human to human connection in the workplace is important. Human to human connection between companies and their customers is important.

And it should not be automated away with AI's because you ultimately ought to automate away the humanity in your brand. So I think that when we look at the functions of managers today, the pure management side of managing activity on a day to day basis, that may be better done by a machine because quite honestly, I don't think managers much enjoy that piece of it either.



But the piece that is inspiring the team to do better, setting direction for the team, figuring out strategy, inspiring people to do better for themselves personally and coaching them to grow and learn and expand their abilities and hopefully then move on out of the team onto other opportunities. That's where I hope that automation will help human managers to focus their attention in the future on developing human capital rather than just helping the humans to figure out what to do today.

1:00:13

Kris: And so I'm wondering and it's something I think about a lot, I'm curious what your thoughts are around it is that eventually, that may not be within the next 10 years, maybe further down the line, but that eventually whether we will see, you know, fully automated AI run companies sort of like these dowers that are at least a theoretical possibility right now, right.

Where the need for human beings is completely eliminated in running a company, whether ultimately, if that if that does not happen, if that is because we will, you know, organizations make some ethical decisions, that there must be a human decision maker at a certain level, not because it's necessary, but because we decide. What are your thoughts on that?

Steve: So a couple of thoughts. The first one is there will be some industry, some places where, yeah, we always want to make sure that a human is making the final decision. Medicine is a great example, right? Nobody wants to be told they have Stage 3 kidney cancer by a robot. So we always want that relationship between human beings.

And when we think about adding technology into the medical world, it should always be to support that relationship between practitioners and their patients and not have technology get in the way. So, yeah, we need to be mindful about when should we automate and when should we not?

I'm going to answer the other piece of question in a different way. I suspect we will see fully automated managed companies, but they won't be because of AI, it will be because of blockchain, where a distributed organization is built on top of the blockchain platform and the entire governance and operation of that company is enshrined within the governments and the the rules on how tokens are distributed to reward behaviors in that organization.

I think that's going to happen within this decade. Some extent it's already been created with a number of these distributed platforms. That's most likely the way that a fully automated organization is going to show up on a blockchain platform. Not because this AI is running the show.



1:02:38

Kris: So, Steve, our time is almost up. It has been absolutely fascinating talking to you. So let's finish up with two quick ones. One is sort of summing up all of this stuff, your number one advice to people listening out there, whether they be in small, medium or large organizations, all the absolute most important key takeaways you want them to leave this podcast with.

Steve: So we are in a time of great change and you know, it's not just me telling you this or Kris telling you this. You're listening to this podcast because you really know this because you're hearing it everywhere.

So I'd say 3 steps. First of all, don't panic, right? This can be very overwhelming. When you talk to a futurist like me and I talk about AI, blockchain and augmented reality and oh, my God, having to keep up with the list. It's a dumb panic. It's OK. You're in the same boat as everybody else.

We're all just trying to get through this as best we can. The fact that you're listening to this podcast, the fact that you've already been online, I hope and bought my book means you're ahead of the game, right. Second thing, you're not alone on this. Get help, right. If you are an I.T. person, just listen to this. Great. You already know a lot about this stuff. If you're a business person, you're in the line of business. It's OK that you don't know the ins and outs of AI. You shouldn't. That's not your job. Rely on your I.T. department. Rely on your suppliers to support you. So get the help, because they should be the ones that know all this stuff. That's why I have a job. Why Kris has a job, right. We get to talk about this stuff and help people through it. So get help. Buy my book, right - that's an easy way to get started. You get informed.

And the final thing I'd say is don't wait. Don't keep watching from the sidelines here. I just need to learn a little bit more. Now, I will listen to Kris's podcast next time as well. And you start today. Start thinking about how I can use these technologies to make meaningful moves forward?

Because if you don't, your competitors already are. Your competitors may be startups that you're not even aware of, that 5 years from now will eat your lunch. Ask yourself tough questions like WWJBD - what would Jeff Bezos do? If Jeff Bezos decided to point Amazon's guns at your industry, at your business tomorrow, what would he do to win against you? And then go and do that now. Don't wait for Bezos's to do it. Do it yourself. So don't panic. Don't wait. And get help to do this because you're not supposed to know all that stuff. But you are supposed to be able to take advice. Bring in good talent and help you to move your organization forward.



1:05:36

Kris: And final thing, I want to ask you that I tried to ask as many people as possible when I meet new people is the whole notion of that we already talked a little bit about, I mean, we have linear brains and it is really hard to challenge the brain, to envision the potential out there, etc.. What do you do personally to stay alert and to challenge your linear mind and to be all futurists in the best possible way?

Steve: I set time aside every day to do research and I'm just broadly going out and looking for inspiration. And I encourage people to do that outside their own industry. Don't just look at your business and your competitors businesses, look at other industries. See what they're doing.

Be inspired by them and steal those ideas and twist them and use them yourself. Steal with pride, so get inspiration from what other people are doing elsewhere. So set aside time to research. Maybe it's just 30 minutes a week if that's what you can spare, 30 minutes is better than nothing.

And then it's also set aside some private personal time where you can just sit and think, don't have your smartphone anywhere nearby. Maybe it's when you're in the shower. But make sure you have a little time when you allow your brain to be bored. When you have no other distractions and use that time to just see where your brain goes, because that's what I find, I get to get out of the bubble and start to think crazy thoughts and think, well, actually, could we do that? Maybe we could do that. That's when I get out of that lynya bubble and start to be able to break through. So there's a couple of things I would do.

And if I can be ever helpful to people, I'm always glad to do that. Quick conversation, talks, whatever people need. Yeah, it's my living. But I do it because I know that there are people out there who have good businesses who are doing good things for people, and I want to help them to make sure they do. They use these technologies to do a better job of it, because fundamentally my mission, my purpose is to help people build a better future. And that's what I'm motivated by.

Kris: Building a better future, I don't think we could end on a better note than that. So thanks, Steve so much for being here on the Corporate Innovation Podcast. It's been really fascinating talking to you. So thank you so much for a great conversation.

Steve: My pleasure. Thanks, Kris.