

The Future of Work podcast is a weekly show where Jacob has in-depth conversations with senior level executives, business leaders, and bestselling authors around the world on the future of work and the future in general. Topics cover everything from AI and automation to the gig economy to big data to the future of learning and everything in between. Each episode explores a new topic and features a special guest.

You can listen to past episodes at [www.TheFutureOrganization.com/future-work-podcast/](http://www.TheFutureOrganization.com/future-work-podcast/). To learn more about Jacob and the work he is doing please visit [www.TheFutureOrganization.com](http://www.TheFutureOrganization.com). You can also subscribe to Jacob's [YouTube](#) channel, follow him on [Twitter](#), or visit him on [Facebook](#).

Jacob: Hello, everyone. Welcome to another episode of The Future of Work Podcast. My guest today is Ed McLaughlin, President of Operations and Technology at Mastercard. Ed, thank you for joining me.

Ed: Hi, Jacob, great to talk to you.

Jacob: I was just mentioning before we hit the record button that I had your Chief Human Resource Officer as a podcast guest a little while ago. We talked about a lot of different things from the human perspective and the HR perspective, so I'm really excited to talk to you more about the technology side of things. Before we jump into that, why don't you give people a little bit of background information about you? How did you get to be the President of Operations and Tech, and what does a day look like for you?

Ed: Well, that's a long journey, it always is. One of the things I love to start with is when I left university, I went straight into programming, because I thought I could have a challenging, rewarding career and not have to talk to people. That's the sort of thing you say as a young man, and obviously things turn out quite differently because you learn people really are how everything happens and what technology is all about, so most of my early career was actually in technology startup.

I was fortunate enough to participate in three companies. We had one IPO in there. When I talk with folks about that, one of the things I know which is frequently said, people enjoy sayings, "Celebrate failure." I've never quite understood that. I think you don't fear failure, but you rage against it. I think the whole point is by focusing on what you need to do, you can continually advance what's there. You don't fail, you learn, you regroup, and you keep moving forward.

I think the startup background really helped me. From there, I had a company which I sold to a large processor, which was my first time working that side of it. We did a lot of acquisitions and then when Mastercard was getting ready to change from being a bank-owned association, about 13 years ago, they were looking to bring in leaders who had spent a lot of time in technology, who had run independent companies. I was able to join the management team then and have been working with Mastercard ever since.

I was fortunate enough to take a few roles at Mastercard, actually, through our transformation from being the bank-owned association doing credit card payments to

what we are today. I was part of forming our original products group and then ran actually the global franchise for a while, spent quite a few years doing what we called emerging or digital payments and really, what is the next generation of payments and capabilities, and then about three years ago came in to run the operations and technology organization.

Jacob: What does a typical day look like for you?

Ed: I don't think there is a typical day, like most people. A few things for that, one of the things which I found was extraordinarily helpful is, I try to get time in the office early. I'll always come in, clear the queue. It also works like office hours. Anyone who needs to reach me knows to get hold of me then. You have to be there for all the people you're responsible for. After that I spend most of my day, ironically enough, talking to people, right, helping guide, understand what we're doing, always try to get that feedback from customers.

The other thing which is really important to me, this is a rule I've held to. I always tell my folks, "Try to do something every day that makes you feel stupid," because I think that's the heart of learning. It's very easy, no matter what you do. I'm sure with what you do, Jacob, you can be quite accomplished in what you're doing, so you're not pushing yourself. It's that moment where you're not as good as you are in what you normally do, that you know you're learning and you're stretching. I do that a lot.

Jacob: What's a recent example, by the way? What's a recent thing that you did that made you feel stupid?

Ed: I got obsessed with natural language processing. When you start learning that, how do you create a parsable syntax for your organization, and actually extended out... Now you've got me going, if you think about how Turing was trying to figure out whether or not mathematics were complete if you could prove it, and ended up with a universal computing machine, or computers as we refer to them, I was doing the same thing.

If you want to create the universal answer machine, what would it have to look like? How could I get any question in the organization answered perfectly? It got me thinking about data sets and how we talk about things. It's a way of taking something that is just interesting, how you apply artificial intelligence to natural language processing, and then was able to bring it back to problems I'm trying to solve every day.

Jacob: Very cool.

Ed: Yeah, the other thing is, and you understand it, is I also spend a lot of time traveling. Mastercard is an extraordinarily global company. We do business in about 210 countries and regulatory districts, and things like that. Over 65% of the folks who work for me are outside of the United States. I think the more tools we have that allow us to connect, the greater need it is to collaborate. I spend a lot of time also just going out, making sure I'm getting that direct interaction with people I work with.

Jacob: I can't believe I'm going to ask you this, but for people that are maybe not familiar with Mastercard, can you give people a little bit of background information around what you guys do, how many employees do you have? You mentioned you're in 210 countries, but any other background information about the company for people.

Ed: Yeah, absolutely, and I'm really glad you asked the question, because a lot of times people think of the iconic square of plastic and for me, that's just one way we express what we do. Mastercard runs a global network that pulls together everything from payment processing, debit, credit, prepaid, commercial handling. We have, through companies we've acquired, account to account or ACH type processing, so really any way that a consumer would want to pay, we can enable through our network.

If you think about that, we're one of the original platform companies, bringing together tens of millions of merchants and tens of thousands of financial institutions for two and a half billion consumer accounts. Mastercard runs a Facebook-sized population of accounts, and making sure that it will work flawlessly, literally anywhere in the world. What we also do, though, is a lot of other things that add value to that, things like loyalty programs that we can enable. We have a great data and analytics and advisor service, where we can use the information that's the network in aggregated ways, to get new insights out of how literally commerce happens everywhere in the world.

We also do a lot with fraud and cybersecurity to help make payments safer and to make it easier for consumers to work on. The way I like to think about it is we're one of the original platform companies, so innovations you might think about like an Amazon in e-commerce, or iTunes in digital media goods, maybe an Uber going public today in mobility, all of those innovations and transformations are in some ways based or incorporated capabilities we provide, the ability to change the way consumers interact or do commerce pulled through the Mastercard network.

Jacob: How many employees do you have at Mastercard?

Ed: Right now we're north of 15,000 employees spread around the world. It really matches our customer footprint, so probably between, for the operations and technology organization, [inaudible] all of Mastercard, it's about 65% of us are outside of the US.

Jacob: Wow, yeah, definitely a global company. You mentioned something that I thought was pretty interesting, and that is that you spend most of your time either traveling or meeting with people, which is interesting because you are in charge of operations and technology. I think when most people think of technologists, people that are responsible for operations, they think of people who are, I don't know, coding or sitting in large IT farms wearing white lab coats. It seems like most of your job is actually people-focused, not actually just sitting there and coding and tinkering with technology. Has this been an evolution in the world of tech?

Ed: Well, I think technology has always been people at its heart. One of the things that I would say, if you think about all the amazing technologies available to us, right, whether it's what we can do with the ability to be much more agile in releasing tech faster, or

leveraging Cloud capabilities or APIs and interfaces, the amazing things we're doing with artificial intelligence, in some ways all that's just stuff.

What really matters is who are the people, and how well we use the stuff, how good we're at it, and how much we understand what all of that's for. Technology is always for a purpose, and it's people that give it that purpose. Yeah, I spend a lot of time. I still code every once in a while, but it's not the work of doing it, it's really working together to create the value that is. I think just about everything we do is either done through or with technology these days. It's just really how we make things, how humans work together.

Jacob: I love that kind of messaging, that positive spin on using AI with humans because, as you know, pretty much any time you read a research report or turn on the news, there's a lot of doom and gloom. I mean, it's everywhere, right?

Ed: Yeah.

Jacob: AI's going to take over jobs, jobs apocalypse. I've talked about this many times on the podcast, but it seems like you are optimistic about the role that technology and AI will play with humans, so I'm curious to hear A, why you're optimistic, and B, maybe what are you doing internally at Mastercard to make sure that relationship is positive instead of tech replacing human?

Ed: Yeah, I'm profoundly optimistic on this one for a lot of reasons. I think most of the more apocalyptic views of AI, I think best thing to do is actually become a practitioner and understand what it is, where it is and how it's doing. A few things for that, I think human advancement has always been about harnessing power, whether it was animal power, mechanical power, electrical power, and now in some ways, computer cognitive power. It eliminates toil to free people up to do more work. When I hear talk of a jobless future, I just think it's just a lack of imagination. I mean, when I think of all the things I wish we could be doing if we could have more resources freed up, my lists have lists.

Jacob: Your lists have lists.

Ed: Yeah. Well, think about that. Think about how much we could do. I've sorted it into three buckets when you think about it here for Mastercard. One of which is there are things which are just toil, right? You do it, and therefore if you've done it, you have to do it again. It doesn't advance, it doesn't really create value. All of those things you would want to offload, just like you'd use mechanical power so you could move more weight or whatever that would be.

A lot of those things you want to use for automation to free people up to do what people do, which is make, create, work. I think one, using as much AI as possible to make things more efficient is just profoundly helpful. That leads to two other categories. The second category we talk about a lot, and probably we're seeing the most value these days, is human-machine interaction, how you can couple what AI is great at, being

able to make predictions, being able to understand and matching large data sets with the insights and capabilities that people have.

One great example is, we want to make sure anywhere in the world you use your Mastercard, it's an awesome experience that'll work. That's a lot of data flowing through the system. One of the things we have, we call it AIOps, AI is for our operation. We can now model exactly what we think is going to happen, and then if something deviates from that, all the AI can tell you is something weird just happened. What it then means is, the human experts can immediately say, "Hey, is this merchant having a problem? Is this part of the network flapping a little bit, and we need to go after it?"

It's that combination of this harnessed cognitive power or modeling power that gives you really cheap prediction, with then being able to invoke human expertise and insights to act on it and take advantage of it. That's where we see a lot of things advancing.

Jacob: What might be an example of where AI inside of Mastercard might flag something weird?

Ed: Well, I'll give you a great example. Actually I'll do this in that third category, which is there's also things you can do now by harnessing AI that you could never do before, simply because you just wouldn't be capable of it. That's where you really see new value being generated. When people talk about AI replacing jobs, it's like thinking of a car as a horseless carriage, right? I think you don't really understand what it can do and how it can harness it, and how it can change and advance things.

One of the things which we have, it's a program called SafetyNet. It monitors all transactions in the network in real time. If it starts to see things which resemble a known fraud pattern, it can begin intervening. One of the things that was happening a few years ago, was criminals would get control of an account and try to drain through ATMs, really odd surge that was hard to pick up on the network.

We built models that were able to see it and we could intervene and stop it before they could actually exfiltrate the funds, before the money could leave the system. Last year it was about \$6 billion, billion dollars, in fraud we were able to stop before it happened. Well, that benefits everyone, because that's something you could only do with these type of systems.

Jacob: Yeah, that's pretty neat. Actually you won the Forbes CIO Innovation Award for SafetyNet, didn't you?

Ed: Well, I was proud to represent the team and accept the award on their behalf, but yeah. That gets back to the point you made earlier, right? All of that you can say, "Well, the AI is doing it." Well, it's the people who use the tools to make that value. It was the expertise of the folks who understood how to do the modeling, what the data sets look like, how to create it, how to put it into practice and how to constantly monitor it to make sure it's working. Is it the AI that's doing it, or is it all the brilliant engineers who

created the AI, who are responsible for it? I think it's the engineers who created it. It was just a tool they happened to use.

Jacob: Yeah, very true. I read in that same article that talked about SafetyNet, you mentioned that at Mastercard you get 200 fraud attempts per minute.

Ed: Yeah.

Jacob: Just so people can understand why AI is so important, because if you didn't have AI, how are you going to monitor 200 frauds per minute?

Ed: Well, I think that's what you see. This is why just think of it as a tool, so as things begin to scale, it really goes beyond things you could do anyway with human acts, human endeavor, even if you wanted to. That's why, and I'll go back to the framework I was talking about, I absolutely want to eliminate all the toil, to free all of our people up to do things which create value. I think they can create even more value, if we can combine analytics and machine learning and cheap prediction to help them do their jobs better through the weirdness detection or other things that we've talked about.

Then we have this whole ability with blocking these fraud attacks, identifying a bot coming in, stopping fraud before a page can even go out to a human operator, creating that new value around it also. You really see it across the board. In fact, another example that I love, we have capabilities called NuDetect, but in a world where a lot of personal information unfortunately, has already been breached, how do you really tell who you are online?

It's an AI that can constantly observe your behaviors, how you type, how you hold your mobile device, with the altimeter, how tall you are. It takes hundreds of different inputs and can assemble a profile which is actually modeled to your behavior. It would be impossible for someone to steal, impossible for someone to recreate.

Jacob: That's pretty amazing. You said it looks at your height?

Ed: Well, sure. Well, it knows how high you hold your phone, so whether you're sitting down or standing up or things like that. It takes all sorts of signals and it can combine them to create a unique digital signature. Then the next time you want to do something, if the signature's still the same, I don't have to bother you with all sorts of sign-in protocols or passwords or other things of that nature. I can get much more prediction, yes, this is you, much more certainty, simply by observing your behavior.

Far better than asking you questions like, "What was your high school locker combination?" that you probably don't remember anyway. It's this idea of harnessing new technology to solve problems in a different way. Therefore, you can be even more secure, but also a lot more convenient for everyone who's using it. It's through the application of things like AI technology.

Jacob: What about the people who are out there that say, "Ah, this Ed guy, he's nuts. We're going to have lots of jobs eliminated because that's what all the data and the research reports are saying." I see daily, for example, even today actually on Facebook, somebody put up a little video of a robot in a hotel that was walking around and was giving people directions and instructions. It was like this robotic security guard. Immediately, the comments in that post were, "Yeah, this is going to replace all the employees in the hotel."

Then, when it comes to autonomous cars, everyone says, "This is going to replace all the drivers." When it comes to customer service and AI, everyone says, "Customer service agents are dead." There's this big fear that pretty much anywhere you see a piece of AI, and anywhere you see a robot, that just means that every human in that space is gone. How do you talk to people about that who believe that autonomous cars will replace every driver, robots in hotels will replace all the attendants who are there?

Ed: Well, I think the nature of work is always changing. When you spend all your time in technology, you learn that, right? I would say most of the skills I had when I left university are now completely archaic. If I see a system I'm still qualified to run, I get worried, right, because we're constantly knowing that things change and refresh your skills. Now the cycles are faster, right? A lot of the things where the change would happen across generations are probably going to happen within generation.

That's where I get back to, there's always so much more that we can do. If you offload certain elements of hotel service, it creates better and different opportunities to serve. An ATM, an Automated Teller Machine, was supposed to say, "You don't need bank branches anymore." Well, I think if you walk around New York, there's a whole lot of bank branches still around here. I think, like I said, it's a way of eliminating certain toil, increasing service. It'll change the nature of work, but in certainly my career in the technology field, that's changing all the time.

I think it does become one much more of recruiting the best people, learning as a skill, and constantly not holding on to the way things used to be done, but making sure we're constantly finding new and better ways to use all the capability and talents that people have. When the unions try to hold on to the coaler as a job on a diesel train, I don't think they're helping anyone.

Jacob: Yeah, no, hey, I totally agree. In fact, you mentioned that people who believe that technology is simply going to eliminate jobs lack imagination. I actually had one other podcast guest who said that, and that was Nolan Bushnell. He's the guy that created Atari, he created Chuck E. Cheese, and he used that exact phrase. Actually, when I asked him what he thought about jobs getting eliminated, he got angry. He's like, "No, these people are nuts. They lack imagination. These people need to wake up." I love that you actually used that same phrase of lacking imagination, because I totally agree.

Ed: Yeah, it really isn't. Look, he created Chuck E. Cheese, but there's still bands out there.

Jacob: That's true [crosstalk]

Ed: Right? They didn't automate that away.

Jacob: No, yeah, totally agree. You guys are doing a lot in this world of AI, but what are you doing internally at Mastercard, because I'm sure this is something that you've talked about internally, using AI inside of Mastercard. Are you doing anything specific to help make sure that employees don't get automated, or that they're constantly upskilling and retraining themselves to stay relevant? How do you address this internally inside of Mastercard?

Ed: Yeah, and I'm really glad that you're putting it that way because I think, like anything which is I guess emergent, there's way too much focus on AI and what's the implication of AI. You have to take a step back and say, "Well, what's happening with work, and how we work, and how we work together?" I actually think that's a relatively small part of the overall revolution that we're seeing, because getting back to your podcast, the nature of work is changing profoundly. While things like AI will have a big impact for it, that isn't the only change or perhaps even the dominant change that I see happening.

One of the things that we think about a lot is the employee's workbench now, if you will, really is the digital tools that we use. It's how we connect, it's how we collaborate, it's how we create. We did a pretty substantial change in Mastercard a few years ago, where we pulled together all the employee tech, all the employee-facing tech, and now even begin incorporating the physical environments they're in and saying, "What's the employee's digital experience? How can we make sure everyone that has to work or wherever they were anywhere in the world, can work together effectively?"

As you think about how that nature of work has changed, giving people the right tools and the right place and having it work together perfectly, that I think is an essential challenge. When we think a lot about, "What's the working environment and context that people have, and how do we make that great? How do we find out what's in the way and constantly remove that?" By the way, I think email is a bane of everyone's existence and probably takes more than it gives, but we can go there later if you want. We think a lot about what's the working environment and how do we get out of the way for people for that.

I think the second point, which is critical for that is, while it's important to think about how people work, we always have to remember why they work, and give that sense of, "Here's what you're making. Here's what you're creating, here's that ownership culture that we want to have," making sure that people know that what they're doing is meaningful, making sure that they can see the output of what they've done.

I think in our heart, people are makers. That's why I'm not so afraid of AI. You want to know what you're making is good, it's making a difference, who the customer is, how that's changing, give that back to people constantly. This is maybe back to the "Do something that makes you feel stupid everyday," the ability to constantly learn, grow and advance. One other example for that, just as I talked about changing our organization to create a whole sector focused on the employee's digital experience and their effectiveness.



We also do a similar thing with learning. When we were with our board a few years ago, rather than asking for funding to build the next big thing, what we really asked was an investment in the people. Everyone in Operations and Technology has a learning bank. Right now you're banking about two hours a week, that you can then use to apply to get better at the job you have or to learn something else about where the skills are, where you want to go.

The idea is being part of Mastercard, part of the culture, is this idea of constantly learning about how to do what you're doing or how to make it easier, how to incorporate new technology. I think that's a model that all organizations are going to have. The idea that you get a four-year certification and a crippling debt and then can use that for the rest of a 40-year career, it's never been true in technology and it's becoming less true in all sorts of other disciplines.

We're building the systems in place to really celebrate that. In fact, one other thing I love, well, I'll give you two examples. One is for our current employees, we're working with universities around our tech hubs to provide training or learning opportunities for them. We're working in cybersecurity with Washington University in St. Louis, where instructors come in for a graduate-level course in cybersecurity. We have a group of employees that, every Thursday at three o'clock go upstairs and they're taking graduate work right in our own facility, so they can continue and enhance their careers. That's a model we're going to push further.

The other side of that is, I think you learn by teaching. We're doing a lot to give back to the community, which also helps make things meaningful. We have a number of programs, but probably the most renowned signature program is our Girls4Tech. We're really trying to encourage girls, particularly in middle school, around STEM careers and education. Mastercard has reached over 400,000 girls globally with this curriculum. It's a way of building a pipeline and also allowing our employees to share the knowledge they have, and in doing so think, I think, a little bit more about how they do it and why they do it.

Jacob: I know your CEO's a big believer in diversity and inclusion. Even when I interviewed him for my new leadership book, that was the main area where he shared a lot of really cool things that you guys are doing, so kudos to you guys at Mastercard. You talked about a couple of different things. Maybe we could talk a little bit about the employee experience on the technology side. You mentioned that, I think it was a couple of years ago, you revamped the tools employees have?

Ed: Yeah, I think part of it was, we anchor what we produce, what we make, on experiences. There's experiences we think about for all of us as end consumers, right? What are the apps? When you use your Mastercard, does it work flawlessly? What are the other things you wished you could do? All those type of things and that leads to the work we did for things like Apple Pay and other things, which are innovations that we participated in we're profoundly proud of.

We think a lot about our customer's experience, what is it like working with Mastercard? Again, I said we're a platform business. If you're a merchant or a bank that

wants to work with Mastercard to advance what you're trying to do, how compelling, how easy is it for you to do that? We really added, as a third and peer pillar to that, the employee experience, because the easier it is for employees to do their work, the more that we can get things out of their way to create that value, the better the customer experience, the better the consumer experience that we can deliver.

I think before, a lot of times, and still in many organizations, employee tools are considered a cost. We tried to change the thinking from saying, "How do I minimize the cost of licensing software?" to say, "How much is a little bit more productivity worth on our payroll?" If you take the mindset of, not tools as cost center, but employees as your greatest asset and certainly one of the most expensive assets you have, how do you do everything possible to make them more effective?

Using that lens we then went back and said, "Look, it's a journey. We're still working on it, but how do people collaborate? How do you connect with who you need to connect to? How can you use the tools that you need to get your job done. What are the things that people didn't have that they may need? What are the things they had that were too hard to use?" You start changing policies around that.

We found out it wasn't investing in the tool, it was investing in helping people learn how to use it better. That made a big difference. There were certain policies that we had done that weren't really adding a lot of value on the security side and were making everyone nuts, that you could scale back a little bit. How often do you refresh the equipment you give people so that they're not fighting it, it's enabling them for what they want to do?

It really was taking this whole employee experience and this is something we're seeing gaining much more currency, which I think it should, really throughout the industry, because as I said earlier, how we do our work now is through technology. I don't think perhaps we've had as much of a focus as how do you make it all work together? How do you make it seamless? How do you think of it more as, these are ways you enable productivity, not costs you have to bear?

Jacob: What were some of those technology changes or enhancements that you made? You don't need to give specific vendor names if you don't want, but maybe you could give us a picture of, what was it like before versus what was it like after you made those changes?

Ed: Well, I think you had a lot of different tools that weren't, for example, mobile accessible, while you had an employee workforce that was mobilizing rapidly. Getting the right security postures and procedures and solving for that so you can get access to what you need to get access to anywhere. Moving things in sync. We had moved to open plan office spaces, which meant people were more mobile, which was great, but we hadn't upgraded the wifi to handle the load of what was there, so it became frustrating because they thought Skype and other things were dodgy, when actually it was a networking issue. Really understanding, seeing that, and thinking all of that through.

Streamlining the number of tools. You want to get really good at a few things, because you can support it, because it makes it easier for people to switch around their jobs. When you say, "Well, why do we have two things which pretty much does the same thing?" The answer is, "Because we haven't found a third one yet?" It's really not the right way to think about it. Building a cohesiveness of the set of things we work on, so people who want to move from one team to another team can do it easily. The people supporting it can build additional expertise. That, I think, helps build community, commonality and culture, so a lot of those things.

Introducing much heavier use of video conferencing, so as people we can interact more with each other more easily. As we've moved to more of an open plan, the ability to reserve rooms instantly and easily. When you do need to huddle or collaborate or things like that, it's available to you. It's one of those things where you constantly look at and get feedback from what people are trying to do, find out what's in the way, and keep streamlining and improving that.

Jacob: You mentioned you moved, you said towards a mostly open floor plan. Did you guys have a lot of cubicles before and you recently torn them down? Maybe you could talk a little bit about the changes you made to your space.

Ed: Sure, and physical location is essential. Let me talk about it in a number of ways, one of which is the essential of saying. "Where do you operate?" We shifted to what we call a tech hub model, again speaking to the technology organization, we wanted to have a set of scaled centers. One, it's easier for those learning opportunities that we've talked about. Two, it gives people great ways that they can move between teams to learn different parts of Mastercard and technologies we have.

Career advancement, because you have larger sites that people can work out, so really investing in that. Then mapping them around the world. We have the main center in St. Louis, in New York, in Dublin, now in London, and in Pune and Vadodara in India. We have one we've just opened in Sydney. It gives us these great catchment areas, rich university base, great places for people to work that we can attract top talent into. One is just thinking about the place, before you even get to the space.

Then the question is, how do you want people to work together? Even before you get to the cubes, what we did is we said it's a neighborhooding concept, where you don't organize around the organization, right? I think a lot of times you used to see that Sales is over there and Tech Support's over there, and Engineering's over the horizon. Well, that really doesn't work if you want to have a truly agile environment, a reactive environment.

As you move from having products and services that might happen to be based in technology, to the technology itself is the product and service, you want to bring it together in a different way. In those hubs, which are in the places that we want to recruit the talent from, which now allow us operate truly on a global basis, we created what's called a neighborhooding model, where you organize around the objective. You organize around the thing the customer gets from you. You organize around what you make.

Engineering, quality engineering, the business operation side, delivery, customer, as much as we can bring it together we do it in a neighborhood. Then and only then you say, "Well, what should the neighborhood look like?" The concept which we're really building out, that was the idea of hackable space, because there is no one good way to do it. Whether it's cubes or a set of small offices that looks like an ice cube tray or a giant open plan, the question is really, "What's the type of work you're doing and what's most effective for that?"

We like to have environments that facilitate collaboration, a little serendipity, a little creation, without being oppressive. Everyone should feel like they can have a conversation, normal voice, without feeling like they're bothering someone. Everyone should be able to collaborate and move and feel better about it. That's something that we want the teams themselves to determine. What's the best working environment for that?

Across our different facilities, we have a set of floor plans now. We continue to cycle and tweak and upgrade that, but I think what's most important is no matter how big your company, you work on a team. You want the team to have a place, and you want to feel like everyone you're working with is right there with you for that commonality of action, but, and this is essential, particularly for Mastercard, you're connected to everyone in the world equally. There's no implied hierarchy by location either.

What we like is having the teams together and then having teams in multiple locations working on the same thing, because that actually emulates how we serve our customers. One quick element on that one, too, because a lot of this is theory. I think too much at times it becomes dominant narrative or what's fashionable, and you've got to make it data-based.

One of the great things is, one of our leaders in Operations and Technology just got her PhD. She studied how do you do agile development across multiple locations, because there wasn't a lot of really good literature or research on that. That's what we found, is you can actually be very effective across locations as long as you're not splitting core teams. We used that analysis of actually our own information, to really help optimize how we're locating what people do and where they do it. That leads to what the physical space is for. [crosstalk] one other thing that we did [inaudible 00:37:28]?

Jacob: Yeah, yeah, please.

Ed: The cloning and engineering thing, I think you want people to come into the office. I think the reason a WeWork exists is people want to go somewhere to work and to be together. You try to create that space, but I think there was a fashion for a while of, no one had a location that was just all free range. What we found, particularly for engineers is they hate that, right? They want to show up, they're coding, they're in seats all day.

In an early experiment, where nobody had a permanent location, we had someone who ended up going to a state fair or something and they won a large banana. I'm not

making this up, a giant, stuffed banana that they would leave in their chair of where they wanted to sit any time they left it. Nobody ever messed with the banana because the person was clearly crazy, but that is how they were able to protect their space.

Jacob: That's genius. That guy should be promoted or that lady should be promoted immediately.

Ed: Yeah, so that's why now literally in the office, we have an office here in the Flatiron that I'm joining you from, and I can see people's pictures of their kids on their desks. They have a place for their toothbrush when they get back from lunch and things like that, but we've tried to keep the office dynamic. As the size of teams change, as objectives change, we shift where people are in the location, but you always have your place, and I think that's really important.

Jacob: Does this mean that you guys as a company, I mean, do you have flexible work programs where people can work from anywhere, or is it mandatory, everyone has to show up to the office?

Ed: No, what we want to do is be objective-based, right? We have incredible talent that works remotely and I wanted to make it more that, wherever you are, we can make you as effective as possible. We also have a lot of great flexibility and I think it's really helpful for people to balance their true obligations in their life with what we're doing here. What we want to make sure it doesn't tip into is people come to meet with their coworkers and collaborators only when it's absolutely necessary.

I'd like to make it the other way around, where everyone wants to be here, but if for whatever reason you can't, then you can still be effective. I think it is important, I think we need, and I think the WeWork phenomena has certainly demonstrated to us that people need to convene, they need to collaborate, they need to be together. You see those teams being more effective, so you can use a lot of tools to give people the flexibility they want. I do think a sense of place is very, very important.

Jacob: Yeah, and I suppose it goes back to this idea of creating a place where people actually want to show up, because I mean, if you just had gray cubicles with brown walls and said, "Everyone, you have to show up to work," I'm not sure how much more productive or collaborative employees would be, because they would not like the space. If you create this environment that's beautiful, that's nice, that caters towards different ways of working, then of course employees are going to say, "I don't need a WeWork, I got a beautiful space that I can go to."

Ed: Yeah, I think that's exactly right. I think we are so much more impacted by our environments than we've given it credit for in the past. I do think if you want people to be creative, if you want them to be collaborative, if you want beautiful things to come out of what you're doing, you need to create the environment that fosters that. I do believe, as humans, we want to work together. We organize ourselves in groups. It's how you can do more than what you can do individually, is by who you collaborate with.

That strength comes through the team, the diversity that Ajay was talking about, it's diversity on all dimensions and it's including diversity of skills. When I talk about an engineering team, I always like to use the example, it's like a band, right? Everyone, and you want whoever's invested, whatever given instrument they have, but you all come together to play the same song. To make it and how well you play together is actually how good the output is. A bunch of individual players who just aren't coordinated, who don't gig together, who don't rehearse together, who don't do it, just can't do a good job at showtime. I think as part of that you just learn how to play together and that makes the team more effective.

Jacob: Yeah, couldn't agree more. I wanted to jump back to something you mentioned earlier around technology and ask you what your thoughts are on privacy and security, because you mentioned this idea that the phone could know how high you hold the phone. There's a lot of data that we can start to collect about customers and prospective customers and employees. How do you balance the information and the data that you collect with privacy and security and the creepy factor.

Ed: Yeah. I don't think there's a balance, I think this is an absolute. For everything we do, we fully recognize that we are simply stewards of the consumer's information for them. Even the example I gave you of how we can get that signature, that can never be tied back to you. There's no giant honey pot of information. It's actually held and comes only off your device. What we do is, we use those signals to be able to verify, "This is the same signal I got before," not that it's you.

It's adding certainty into the processing, but it's not identifying you. We are a huge advocate and adherents to the highest standards of privacy we see around the world, because that is what consumers deserve and that is great business for us. Mastercard has never used personally identifiable information to target people for something specific. That becomes part of culture and ethos for the whole organization is the respect for consumers' information and their privacy. That's always been foundational for what we do.

That includes security, where people entrust us with access to financial accounts and things of that nature. We see privacy and security as really twin values that are the foundation of the brand, the promise we make to everyone who works with us. [inaudible] thought, not an afterthought in any decision we make is, "Is it secure, and is it respecting the privacy of the information of the people who we're working with or who we're working for?"

I just think that's incredibly important. Now, using that information in an aggregated way can lead to incredible things to prevent fraud from happening because we can look broadly at those patterns. I love this, we were working with several cities, Baltimore is one of them, where we were combining crime statistics with what we see as commerce flows. We could actually generate a business case for public safety to demonstrate, "As crime was reduced, here's the type of businesses and the nature of businesses that were there when it surges. Here's how the hours of opening change. Here's the mix that happens on that, here's the drop in value, here's the closing of businesses [inaudible 00:44:34]."

There's an incredible richness in the information, and we do a lot of great things with that, but as I said, only in the aggregate, because the privacy and respecting that privacy is a foundational value for what we're doing.

Jacob: When you think of all the different technologies that are out there in the world, are there certain technologies that you're paying attention to more than others? Are there other technologies that you think are maybe a little bit over-hyped or were just a little bit too early with?

Ed: Yeah, a set of technologies that are out there, and I think technologies getting over-hyped is what we do as a technology industry, right? I think there's always great enthusiasm. I think, usually there's a little disillusionment and then you start to see the value that you knew was there all along. What I try to do is stay below the hype cycle, but really look at what is and how do you advance the state of art that's out there?

A few things I would say. I stay away from a lot of the hype, I'll call it around AI, but the things that we can do to make our network profoundly better, the fraud tools we've put in place, the toil we can eliminate, we're seeing huge value from that. I don't know if an optimist you called me, I think I'm a true enthusiast for that because I can see the value that we're getting. Again, it's not the extrapolation to where it could be, but what we can do today to make that better.

We're seeing a lot happening on that side. I am extraordinarily happy with the things we're seeing through Internet of Things, the ability to say, "Every device is a smart device, could be a connected device, can use that to transform." You think about your car, what we're doing with wearables, your mobile, game systems, as we re-platform our lives into connecting devices, the ways we can use that to make things more convenient, to make things better, to make things more secure, I just think is a fantastic opportunity for us.

5G is a great example of something, I think, of something which is both over-hyped and will be profoundly useful. I don't think the ability to download massive amounts of data quickly, that's that horseless carriage thing I was talking about, "Yeah, that'll be better." What I see is the elimination of latency. One of our folks always says, "Instant is getting faster." I think that will lead to much better experiences and new things that we could do that we couldn't do before as we massively accelerate the quality, the speed, the connectivity we can have to all those edge devices that are out there.

What we're doing with Cloud computing, the ability like I said, if AI gives you cheap prediction, the ability to have not only more elastic compute, but the ability to distribute work into available reserves or centers around the world to have a better and more resilient network. Those are all things we're tremendously enthusiastic about.

I think there's a next set of things which I'd put more in the applied research space. Quantum's a great example for that. We've done a lot of work around potential. It's called Shor's algorithm. Potentials, uses of quantum computing could make certain

problems we use for security easier to solve. This is the whole RSA security system, if you're familiar with that.

Jacob: What is quantum computing, for people that have never heard about that before, if it's easy to explain?

Ed: At a highly simplified level, it's a different way of approaching computing problems. Computers today, electronic computers, are based on a binary system, bits of ones and zeros that you then use to do arithmetic against. One of the ways we do security is having really, really hard problems. If the problem is so hard that, unless you know the answer, you couldn't afford all the computing power or there wouldn't even be enough of it, that's how we do it.

Most of the keys we use for encryption are based on that. If you know the answer, it's an easy problem to solve. If you don't know the answer, it's a ridiculously expensive problem to solve. Quantum computing just takes a different basis for that. Rather than the binary ones and zeros, we call the superposition, you have a huge range of options that could be solved for simultaneously, which means for certain classes of problems that couldn't be solved easily before, they can be solved much more easily in that environment, taking advantage of the quantum effect rather than the binary effect.

What that really just means is, things that used to be hard to do might become really easy. If it becomes really easy, then we have to think about new ways of security. In anticipation of that possibly happening, we're looking at different ways of securing transactions. There's an example of, it's not pure research these days, it's much more applied research, but you have to think ahead of the implications of things that haven't happened yet. That's an example where there's a lot of people who are really excited about the implications, but its time horizon is not going to impact us right now.

Jacob: Yeah, and even with AI, I love that you mentioned that there's a lot of hype in AI, but you're seeing also a lot of value in it, in the area that you're focusing on, but just in general it's probably a little bit over-hyped as far as the impact that it'll have.

Ed: Yeah, I think you need to sort that out. I think we saw a lot of that with blockchain also, which is an interesting technology for solving problems where there's no trust. For all the hype around cryptocurrencies and things like that, saying before if you had three or four parties that really didn't trust each other, how could they all agree on what was true? It's a good solution for that. When we look at things like proof of provenance, where did this come from, or tracking something through a supply chain, the idea that you get an immutable record that everyone has to agree on, that's pretty useful.

When you see other areas like a bitcoin, having a speculative asset class with no intrinsic value, you might argue the same thing for gold, is a much more limited application. A lot of the focus was there, which I think in many ways distracted from what the underlying technology actually was and some of the potential, practical applications of it.



Jacob: Yeah, that makes sense. Maybe one more question before I ask you just some fun, rapid-fire questions. How do you keep up with the pace of change, because from all the people I interview, CEOs, technologists, people in HR, it doesn't even matter, the number one thing that everyone keeps telling me as far as a challenge for the future is how do you keep up with the pace of change? I mean, especially you see this in technology, right? You invest in one area, a new technology comes out.

You also might see this in physical workspace, where what happens if you change your workspace and all of a sudden, somebody else comes into power inside the company and they want to change something, or employees are now asking for something else. How do you just keep up with all the stuff that's going on?

Ed: Well, I think the first thing is that recognition that change is a constant. I do think constantly evaluating new capabilities or new technologies or new things is something that every organization, every person, needs to get really, really good at. The state, rate and pace of change is accelerating. What I think is first is, you need to have a constant survey of what's going on. There's a lot of conventional wisdom, which is usually wrong. Then the ability to say, "Okay, here's everything that's changing, what are the implications that's really for what I need to do?"

Practices are always going to change. You'll always have new technology capabilities, there will always be advances around that. What I try to start with is, "What are the principles?" because I think a lot of times organizations are faced with change, feel like they need to be something else, and that's wrong. I think you win in a time of constant change by always being more of who you are, perhaps who you should be.

If you start with, "What is your mission?" We talked about earlier, security and privacy. I can then evaluate something and say, "Will this make us more secure? Will this help me ensure the privacy and security of the customers we have? Is there something that's changing which has the potential to diminish that, that I need to react to?" I think the best way to start in an ever-changing environment is to anchor on, "What are our principles, right? What do we need to do?" Then you can evaluate everything against that and embrace that there will always be new practices.

For me, that's what you test and validate again. In my career the technology we use has changed constantly. It's just more, "What is it for?" Who we are, how we use it, like I said earlier, not what it, in and of itself, is. One other rule, which I think [Azhay Agyoolar 00:54:00] had it, I'm stealing this one, he's out of the University of Toronto, is "A good way to evaluate change is, did something become fundamentally cheaper?"

Again, from a technology standpoint, when compute became fundamentally cheaper, things changed. Photography went from a chemical process to a digital process because you had cheap compute. When storage became fundamentally different things changed, right? You began having big data and other things you could do that take advantage of that. When algorithms now, through artificial intelligence, have made prediction much cheaper than it was, things that you used to have to [sag] either rule that needs to be deterministic, suddenly can use this cheaper prediction, "Hey, I thought this was going to happen. Something else did," you generate new value there.

Knowing what it is you're doing, all right, not what the technology is, but what you want to do and who you are, and then saying, "What's the implication of this to make what I need to do better?" Always a good rule is that an order of magnitude change on one of the constraints I already have.

Jacob: Do you never feel suffocated by how quickly things are changing? Do you ever wake up in a panic and just think that it's so hard to keep up with everything, or you've figured out a way to maintain it, just experiment and just have embraced that change is the new normal?

Ed: Well, I think what's essential is, you just have to be profoundly curious at all times. I think as humans we are wired to defend previous decisions and that always works against us, all right? I think if you're always exploring, if you're hungry to say, "Is there a better way?" and always be open to say, "I made this decision in this context. How is the context changing, and therefore what are the new decisions I could or should make?"

I do think, and this is hard, you need to have an enthusiasm for what's new, not to be fashionable, not for fashion's sake, but to always be questioning. I think it's a skeptical enthusiasm of, "If a new capability's there, does it allow me to do what I want to do better?" I think as long as you're centered on what you're trying to do, then all the new capabilities I find just profoundly exciting.

Jacob: Yeah, I guess it's just a different way to look at things, just a different mindset that you need to have.

Ed: Yeah, and I do think curiosity at a personal and at an organizational level is essential.

Jacob: Yeah, I couldn't agree more. Okay, we just have a couple minutes, so just some quick, rapid-fire questions for you before we end the podcast, starting off with, what has been your greatest business failure?

Ed: Greatest business failure... That's an interesting one. I guess the filing for an IPO in April 2000 probably wasn't wise. I got to watch the entire internet crumble underneath me. We recovered from that. I think I had some real timing issues on that one, but again, when we talk about failure or celebrating failure, I think what you need to do is just keep reloading.

Jacob: I like it. What's your most embarrassing moment?

Ed: Hopefully not this podcast.

Jacob: No, it's definitely not this podcast. This was great. Did you have an embarrassing work moment that has happened to you?

Ed: Yeah, I guess you certainly do. I'm trying to have one that would immediately come to mind. I once used the phrase "Come to Jesus" to someone wearing a yarmulke. I'm still appalled by that.

Jacob: That's a good one. I've had all sorts of fun, embarrassing moments on this podcast, so that's a unique one that'll stand out. What are you most proud of?

Ed: So many things. I think what I am most proud of is what we've been able to do in the last few years at Mastercard to really embrace and enable a market-level transformation on digital. I talked about the work we had done enabling things like Apple Pay, the digitization of the whole network and the application of artificial intelligence against it. If you think about what you make and how we've been able to advance, I'm extraordinarily proud of what the teams here have been able to do.

Jacob: What's the hardest business decision you've ever had to make?

Ed: It didn't seem hard at the time, but I guess starting a company. [crosstalk] Yeah, you have what you're doing while you're conscious of it, but just saying, "You know what? I'm going to go out, I'm going to take a blank sheet of paper and I'm going to make something from scratch." It's much more audacious than you realize when you get into it.

Jacob: Oh, yeah. What's your favorite business or non-business book?

Ed: Business or not, *Soul of a New Machine*, Tracy Kidder, changed my life.

Jacob: *Soul of a New Machine*? I've never heard of that one.

Ed: Yeah, I think he won a Pulitzer for it. It was when I was in university and it was the story of Data General. It was just this epic tale of human endeavor. I'll read anything Tracy Kidder ever wrote. It was what it took for them to build a new computer system. It caught so much about what was changing at the time. It was this just incredible tale, like I said, of human creation, achievement and things like that. The lesson at the end, when he's talking to the protagonist about, "You did all this. Now what?"

He said, "You have to understand, building systems is like playing pinball. The only thing you win is a chance to play again. You got to love the game." I've always held to that lesson.

Jacob: I'm going to check that one out. Last two for you, who's the best mentor you've ever had? You don't have to give a name if you don't want to, but maybe what did they do to be such a great mentor to you?

Ed: Best mentor I ever had, I'll give a name. John Connolly hired me out of university. Seeing how he ran a business, thought about business, took care of his customers, the diligence there, it was a very, very early part of my career. I really, for a lot of times thought about how he would have handled something or how he thought about it. It wasn't so much that direct mentoring, "I'll take you under my wing," but the ability to see just a profoundly good business and profoundly decent person operate and learn from that early.

Jacob: You said John Connolly?

Ed: Yeah. Not the former Governor of Texas.

Jacob: Okay, so he was a business leader?

Ed: Yeah.

Jacob: Got it, okay. Last question for you, if you were doing a different career, what do you think you would have ended up doing?

Ed: Different career, if I end up doing this? What do I think I would end up doing? I guess if I had to go for a divergent path, it probably would have been teaching.

Jacob: Okay, noble career.

Ed: Yeah, my mother was a teacher.

Jacob: Oh, very nice. Well, those were all the questions I had for you. Where can people go to learn more about you or Mastercard, connect with you on LinkedIn, anything that you want to mention?

Ed: Yeah, I would encourage everyone wants to know more about Mastercard or my humble part in it, just to come visit us online.

Jacob: Simple. Well, Ed, thanks for taking time out of your day to speak with me.

Ed: Thank you. Take care.

Jacob: Thanks everyone for tuning in. My guest again has been Ed McLaughlin, President of Operations and Technology at Mastercard. I will see all of you next week.