**WENCES CASARES (VOICEOVER):** I cannot change it nobody can change it -- not government, no company. So, that's one thing. And the other one is it's uncensorable. Nobody can keep you from acquiring Bitcoin. Nobody can keep you from sending Bitcoin to anyone, and nobody can keep you from holding Bitcoin.

**KEVIN SCOTT:** Hi, everyone. Welcome to *Behind the Tech*. I'm your host, Kevin Scott, chief technology officer for Microsoft. In this podcast, we're going to get behind the tech. We'll talk with some of the people who have made our modern tech world possible and understand what motivated them to create what they did. So, join me to maybe learn a little bit about the history of computing and get a few behind-the-scenes insights into what's happening today. Stick around. (Music.) Hello, and welcome to the show. I'm Kevin Scott.

**CHRISTINA WARREN:** And I'm Christina Warren senior cloud developer advocate at Microsoft. And today, we're going to hear from the CEO of Xapo, Wences Casares.

**KEVIN SCOTT:** Yeah, Wences is a true serial entrepreneur and one of the most influential investors in Bitcoin. Some of the folks in Silicon Valley credit him as the person who brought Bitcoin as an entrepreneurial thing to Silicon Valley. He's just done extraordinary things both with Xapo and with online finance over a bunch of different companies over the years.

**CHRISTINA WARREN:** And you had the chance to speak with Wences a few weeks back in front of a live audience.

**KEVIN SCOTT:** Yeah. I mean, Wences really has a fascinating story he grew up in one of the most beautiful and most remote places in the world on a sheep ranch in Patagonia. I think you'll hear in the interview that he's something like 100 miles from the nearest town or the nearest town is basically a post office. And in the winter, they get completely snowed in. So, he grew up in this environment where he was very isolated, but had the good fortune to have a tinkerer as a father. His story is fascinating. I'm super excited for everyone to get to hear this interview.

**CHRISTINA WARREN:** Definitely, because I know what I want to know is: How does a person who's growing up on a remote sheep ranch in Argentina wind up becoming the CEO of Xapo? Which many people say is the most secure Bitcoin wallet in the world.

**KEVIN SCOTT:** Good question. We're going to find out. So, here's our conversation.

(Music.)

**KEVIN SCOTT:** So, I'm just so excited to have Wences Casares here with us today. So, Wences is a legitimate serial entrepreneur you've been doing this your first company was in 1994, right?

**WENCES CASARES:** Yep.

**KEVIN SCOTT:** And it's just sort of crazy like the number of companies that you started. For a while now, you have been maybe Silicon Valley's most influential advocate for Bitcoin -- the company that you're CEO of right now, Xapo, is probably -- I mean, I guess hard to say, but probably has the largest volume of Bitcoin assets under management and like beautiful wallet software and we'll get into all of this stuff later. But, everybody, round of applause for Wences. (Applause.)

**WENCES CASARES:** Thank you for having me.

**KEVIN SCOTT:** Seriously, maybe the most interesting man in the world. (Laughter.)

**WENCES CASARES:** I'm the Dos Equis man.

**KEVIN SCOTT:** So, let's start at the very beginning. You are from one of the most beautiful places on the earth. You're from Argentina. You have this amazing ranch in Patagonia. I've seen the pictures of this. Your family has been in Patagonia for generations. You're sheep ranchers historically. So, how on God's earth did you get from that to a person in the technology industry?

**WENCES CASARES:** I sometimes wonder the same thing because it's not where my friends ended up -- my friends from Patagonia. And the best way I explain it to myself is three lucky accidents. First lucky accident was that my parents' ranch is very isolated. It's 20 miles from the closest ranch and it's 100 miles from a small town that is just a police station and a market.

And in the winter when it snows, usually you cannot get in and out. So, it's super isolated. My father got into ham radio as a way to communicate with the rest of the world. And that changed the life on the ranch. And night they would fire a generator and they would talk on that radio. And we all gathered around my father as he operated that radio. And we learned about what was going on in other parts of the family and the country from other people. It was super interesting. And sometimes it was the best part of the day. And that led him -- he built his own radios because they were expensive. And playing with transistors led him to build a computer. I would think today we would probably call it a calculator. I never got into the hardware part of it, but he dragged me into the programming of it.

**KEVIN SCOTT:** And was your dad -- had he gone to university or did he just learn all of this stuff on his own?

**WENCES CASARES:** On his own with books. We would go to town, he would order these books. He would wait for them very eagerly. We'd go to town, pick them up. He would disappear every night. And then months later, he would emerge with something fun. So, I think that was a super lucky accident. It changed my life and it's very random that a Patagonian sheep farmer would be interested in all of that. The second lucky accident was that my mom would keep part of the wool production of the ranch and turn it into sweaters and sell them in touristy parts of Patagonia. It's a very unusual entrepreneurial activity. Very unusual for a woman back then to work. Very unusual for someone to be entrepreneurial that way.

And she asked me for help going to these places and selling the sweaters and keeping the books, which was so fun. It was like keeping score. And that got me hooked to that sort of entrepreneurial activity. I think that a lot of the Catholic tradition sort of makes you not entrepreneurial. In a way, I don't know how to explain it, but in a very strong Catholic tradition, it's wrong to say that you want to make money. And my mom, without meaning to, asking me for help with this inoculated me against that. It was fun to try to make money. (Laughter.) It was okay.

And the third lucky accident was when I was 17 in my senior year of high school. The Rotary Club gave me a scholarship to come to the U.S. as an exchange student. And I came to a small town in western Pennsylvania near Pittsburgh where I lived for a year and that changed my life. I learned English. I learned to love this country. And I think those three lucky accidents explain 90 percent of how I got from there to here.

**KEVIN SCOTT:** That is just super fascinating. So, there's this other really interesting thing in your career. If you go talk to folks in Silicon Valley like my fried Reid Hoffman and other folks everybody gives you credit as the person who convinced people to start investing in Bitcoin in Silicon Valley. And you were just super early on. People still I think have a bunch of risk aversion around Bitcoin, but when you started, it was really super early and it wasn't a popular thing even among technology-savvy folks. One of your first businesses that you built you literally brought the Internet to Argentina. You built Argentina's first ISP. Again, back in 1994. Just at the very beginning days.

Since I feel like people throw this word "pioneer" around willy-nilly. Everybody's a pioneer of something. But that's sort of pioneering, right? Identify this really interesting thing when it's almost not a thing at all. And then you're convinced that you need to make it available to the public. Where did that come from? I think there's a lot of luck in there but I remember after coming to the U.S. as an exchange student, I moved to Buenos Aires, which is 2,000 kilometers from where I grew up to go to college. And I would share a train ride, a little over an hour every day there and back with my sister.

And very often, our favorite topic of conversation on the train was how lucky our grandfather who had gone to Patagonia that was a true pioneer. He went to Patagonia. There were no roads, no fences, he had to carry his own guns because there was no police. How fun! (Laughter.)

And it's so unfair, we get to live in a world where everything is discovered. Everywhere has fences and roads and police now. How lucky our grandfather; how unlucky us?

And now I look back and I laugh. I wouldn't trade myself for my grandfather in a million years right now. I think that shortly after those conversations, we stumbled upon the Internet really by luck and chance. And we developed the first Internet service provider in Argentina. And that led to starting other things. And now I look back and say, I think it's one in a million that you stumble in your life into the emergence of something like the Internet and that you get to play a role in a market. But to have it twice in a lifetime or in a career, with that an with Bitcoin, I think it's incredibly lucky.

**KEVIN SCOTT:** Yeah. So, you did this ISP and you sold it. And then you actually at some point did video games, right?

**WENCES CASARES:** Yeah.

**KEVIN SCOTT:** How did that transition go from ISP to video games? I don't know if there was anything in between there and then from that to getting into cryptocurrencies and finance and payments and that whole world.

**WENCES CASARES:** When I was growing up in Patagonia, I saw my parents lose everything three times. The first time was because of huge devaluation. The second time because of hyperinflation. And the third time because the government confiscated all bank deposits. And it seemed like every time they were recovering from the last disaster, and they were getting to a good place, something new happened that made them lose everything. My memory from that is not economic or financial memory, it's a very emotional memory.

I remember them fighting about this and I remember being scared because they were scared and insecurity. And I remember not only them fighting, but the world around us, other people around us being similarly worried and scared. And that was my main impression of the grown-up world. That it has these very unfair things that happen and that hurt the poor more than the rich. Some people with more money than us would buy a little house or an apartment and that would protect their money. And if they had even more money, they may have a bank account abroad, and that would very much protect their money.

But when these things happen, people like us, we get wiped out every time. And that stayed with me as my main impression of these serious things that the grown-ups have to deal with. And when I saw the Internet and started the first ISP, I was in love with it in a very romantic and naive way and I thought it was going to fix all of the world's problems and very quickly. And for me, the main problem the world had was the money problem. Most people don't have an easy way to receive payment, send payment, or store the fruits of their labor in a way that they can be certain that it cannot be manipulated away. So, I started an online bank that for random reasons turned into online brokerage. Turned into the biggest online brokerage in Latin America. It was my first big exit. It was bought by a large bank for $750 million in cash. The first time I made serious money. And then I started an online bank for the poor because the prior company didn't do what I wanted.

We started an online bank for the underbanked in Brazil. Did really well. And we became the largest bank in Brazil for that market. It had 15 million customers, 5,000 branches and it was acquired by the Bank of Brazil. And then at one point, I can't remember if it was an event or a press release something said that the financial services entrepreneur, Wences Casares. And I said, "Why do they say financial services?" I'm an entrepreneur. And I got upset. But, of course, one thing led to another and I had done a couple of things that were in financial services. And I said, "I'm not financial services." "I'm going to do video games." And I did it.

It was harder than I thought. I was lucky that it did well, but it was just a stint. I did a company. We started doing desktop games. And then I actually came here a lot because we did a lot when they were launching Xbox Live. We did a lot of live games and we did console games. And eventually was acquired by Activision. And I never again went to gaming.

**KEVIN SCOTT:** So, that's interesting. I don't want to interrupt the story, but I sort of do because based on my experience, I'm surprised that you say that video games are super hard versus all of this setting up online banks. Finance is hyper-regulated super idiosyncratic type of business. And in my mind, that would be way more challenging to get your head wrapped around. But, evidently, you were able to do that.

**WENCES CASARES:** If you have two equally talented first-time entrepreneurs, who are sort of twins, equally talented, one is going into FinTech and another one is going into video games, I would bet on the video games guy.

I do think that there's more -- because of the regulation and because there's more depth to FinTech. It's a lot of different things, not just payments but lending and risk and lots of different kinds of risk. But if you change it a little and you say instead of being first-time entrepreneurs, one is a first-time entrepreneur going into FinTech, and the other one is a FinTech entrepreneur going into video games, I put my money on the first-time entrepreneur in FinTech. I think there are a lot of things that you think you learn that you didn't. (Laughter.)

It's easier to start from scratch. It's a little different. I should not have done that. Now, really, if I were to go back, I did it out of pride and ego. I was upset that I was being labeled, and I should have just stayed with the label.

**KEVIN SCOTT:** Because most of what you've done after all of it --

**WENCES CASARES:** Yeah, it took me that to learn that this is what I like and this is what I know. But that was a mistake.

**KEVIN SCOTT:** And that's sort of interesting. I had this mentor -- very important, influential mentor in my career. One of the things that he told me is -- he gave me this framework where he's, like, "Imagine that you have five buckets." And on one end, the label of the bucket is "idiot." And on the other end is "genius." And in the middle is "mediocre/average." You take everything that you know about yourself and you can put it into one of these five buckets.

All of us have things that we're idiots at and all of us have things that we're geniuses at. And his thesis was that you could spend extraordinary amounts of effort trying to move something up from one bucket to another. And maybe if you have a miracle, you can move it two buckets. But that means that if you've got this thing that you're an idiot at, you could spend a lot of effort and have a lot of luck and still just be average. And all the while that you've done that, you have deprived yourself of the opportunity to do the thing that you're a genius at. I think that's a really difficult lesson to learn.

**WENCES CASARES:** Yeah, that strongly resonates with me. And the older I get, the more I'm in that different school that you just explained. Which is, forget the areas for improvement, just know that you are bad at that and focus on the ones you are good at. (Laughter.) And just say, "Hey, I'm bad at this."

**KEVIN SCOTT:** Well, and --

**WENCES CASARES:** My wife does that to me all the time. (Laughter.) I'm bad at that, I won't do that. Okay.

**KEVIN SCOTT:** You know, the thing is, the other super power that I think a lot of us fail to realize that's complementary is we get to choose how we build teams and who we collaborate with. And you can surround yourself with people who are geniuses at the things that you're an idiot at. And that's not a testament to how you're deficient, that's just good teambuilding. And it sounds almost childish, but I learned that it is a superpower and it's a privilege that we have to build the teams around us to complement that. But I find that it's as equally almost important for me to say out loud in front of everybody that matters to say, "I am bad at that," right?

**KEVIN SCOTT:** Right.

**WENCES CASARES:** Right. You said that, it's okay. It's true.

**KEVIN SCOTT:** Anyway, let's get back to like how did Bitcoin come into your life?

**WENCES CASARES:** I was living in Palo Alto, running a company called Lemon Wallet. It's a mobile wallet. And in 2011, a group of childhood friends from Patagonia were doing something. They were all chipping in, and they told me to send my part. And at the time, Argentina had cut off all ways of sending money. Western Union was cut off. You had to send money to the Argentine Central Bank and then fill a ton of paperwork and if you were lucky, maybe they would send it to the person you wanted to. But at whatever exchange rate they deemed appropriate. Which was usually not very fair. Seemed very cumbersome, unfair, and too much effort for the money I had to send.

So I started asking my sister if she could pay my friends and I was going to pay her later. And one of my friends, who's not a techie and not a finance guy said, "Hey, why don't you try this Bitcoin thing?" And I said, "What is that?" It's a new digital currency that you can send money anywhere without asking anyone's permission.

And since I am a FinTech guy and I am a tech guy and this was coming to me from an Argentine friend of mine, who's one of my dearest friends, who knows nothing about these things, I was super skeptical. (Laughter.) So I said, "Yeah, right." So, I start fooling around, reading online. It seemed sketchy. And I found someone on Craigslist willing to sell me $2,000 worth of Bitcoin. And I was sure I was going to be scammed, but I said, "Let's try it."

**KEVIN SCOTT:** And what was Bitcoin trading at?

**WENCES CASARES:** This is 2011, it was like $3 or something like that. Maybe off by a little, but around that. So I meet with this guy, a guy in his 50s, very Palo-Alto looking, like long, white hair and super calm. (Laughter.) Makes me download some app and I give him $2,000. And he scans a secure code, and he shows me that I have the $2,000 worth of Bitcoin in my app. And I say, "Okay." And I start walking. And I'm convinced I just got scammed of $2,000. (Laughter.)

Then I get back to the office, and a few hours later, I get a message from my friend saying, "Hey, Wences, I got the money, thank you. I sold them for pesos, we're good." And I'm like, "What just happened?" That took me on a journey that lasted about six months. Part was reading, then flying to meet people who knew a lot about it. Sometimes offering to fly them. Then start mining. Then fooling around with the code. The last stage, I hired some hackers for what for me was serious money to try to break it with a reward if they broke it.

And after I saw what they came back with and said, "Wow, this thing is for real." I started super skeptical, but I emerged on the other side of that. I was at a point where I was ready to throw in the towel on this romantic, naive idea that the Internet was going to make iti so nobody would suffer what my parents suffered again. For the last 30 years, a lot of things have changed dramatically because of the Internet, especially communications, entertainment, a few other things. But basic checking account looks exactly the same, the ATM looks the same, the debit card looks the same. Yeah, you can access them with home banking, but if that's all the process, it's really pathetic.

And if you look at what percentage of the population globally has access to a checking account, a Visa or Mastercard debit card, it's the same percentage. We haven't made any progress. I was very discouraged with all of this and really truly thinking of just retiring. It's like I don't know how to describe it. I was disheartened. And I saw this and I said, "Wow, this is it." If this thing succeeds, it will do for money what TCP/IP did for information. And I decided to dedicate the rest of my career my reputation, my capital, to help this thing succeed. For me, it's not really about money or proving anything, nothing would make me prouder than to tell my grandkids when they ask, "Hey, grandpa, what did you do?" You know what? I saw my parents go through this, and today that's impossible because Bitcoin succeeded and I was part of a generation, an ecosystem, a lot of people who made it possible that it succeeded because it wasn't granted that it was going to succeed.

**KEVIN SCOTT:** So, let's talk a little bit about what Bitcoin is. Most of the people in the room probably are familiar, but like Bitcoin isn't really a monolithic thing it's sort of like a collection of things it's this decentralized peer-to-peer network that has a Bitcoin protocol. It is this sort of public transaction ledger that's called the blockchain.

As a computer scientist, the thing that is really interesting and I think is clever is this whole notion of proof of work algorithm for reaching consensus. And it's the thing that makes the blockchain the blockchain. How do we all agree that the current state of this thing is what it is? And then it's a whole bunch of rules for this is how we do transactions. This is how new currency is printed. You've been in this ecosystem for a really long while. You pressure tested it in ways that most folks haven't. What is the thing that you think most people misunderstand about Bitcoin?

**WENCES CASARES:** There is a saying in Chinese that says that when the genius points at the moon, the fool looks at the finger. That's particularly true in Bitcoin because it has so many interesting fingers, right? Whether it's the cryptography interesting or who the hell is Satoshi is interesting or the financial or legal consequences are interesting.

But it's interesting that most often what's missed is the most important thing which is if you wanted to understand the Internet all of you are really good technologists, so you dive very quickly into the TCP/IP protocol and how is the packet composed? What's in the header and what's in the footer? What are the rules to manage those packets? And what do we do with loose packets? And how do we figure out the routes? And how do we have alternative routes and all of that?

But the truth is, if you had to explain it, so anyone could understand it and make their own judgment about if it's relevant for them or not and in what degree you have to go back to first principles. The Internet in first principles, it's something that moves information from anywhere in the network to anywhere in the network, number one. Number two, pretty much in real time. And number three, for free. There are no gatekeepers. The information can move freely within that network. Which we take for granted today, but most networks didn't have those three attributes back then.

For Bitcoin and blockchain today, a lot of things are being said that are not true. Are either just false or exaggerated or hype. And I find that the best antidote to that is just go to first principles. And the equivalent first principles in the case of Bitcoin is that the only thing that matters that is new since January 2009 when the Bitcoin blockchain went live the only thing that was made possible then that wasn't possible before, everything else was possible before, is this idea that you can have a sovereign computer system. Up until January 2009, all computer systems belonged to a person, a company, or a government. And therefore, you had to obey the rules and regulations of that person that company or that government -- that jurisdiction.

And sovereign used to be kings and queens, now, they're mostly nation-states, and now you have a little, very humble computer system that is sovereign, that only obeys its own rules. I'm not using the word "sovereign" loosely here. I really mean it with all the full weight of it. People do not understand this, which you say, "What is one thing that people don't understand?" Imagine the days of transaction the blockchain is public there is a transaction from last year between Kevin and I, everybody can see it. They don't know that it's Kevin and I. You and I know, but it's there, everybody can see it. You sent me a Bitcoin.

And imagine that Trump, the president of the most powerful nation, wakes up tomorrow and he says, "I don't like that transaction. I don't know who it is, but I don't like it." Okay. And he calls Putin and convinces Putin that he shouldn't like it either. And Putin says, "I don't like it either, let's call Xi." And the three of them decide, "No, we don't like it." And they call Bill Gates and Larry Page and Mark Zuckerberg. All six of them say, "Yes, we hate it. It shouldn't be there." So what? They cannot change it.

And this seems like a joke and it seems trivial. You tell me something else that cannot be changed if everybody else wants to change it. I don't know anything. It is remarkable. More important than that, as they are discussing, new transactions are coming in. And they cannot keep new -- they can put me in jail so I don't send the transaction to be processed, but they cannot stop the machine that is processing the transaction. They cannot stop transactions from being processed. All those same six people.

That is incredible. That is a truly sovereign system. It's the only sovereign system that has ever existed. We may see others in the future. That is a game-changer. Everything else is secondary. And the only new thing that this brings is sovereignty. Most use cases that are being touted for blockchain do not make any sense. I think because the blockchain only adds value to something that can benefit from sovereignty.

So, where people tell you, "Oh, it would be great of blockchain to keep track of property titles." It's ridiculous. That doesn't follow any logic. Property titles have value because they have been issued by an authority either a county or something like that. It's enforced by the courts, it can be enforced by the police, all of those are central authorities. You cannot add any value by adding a sovereign to all of that, right? Same thing when people say, "Oh, use the blockchain to important security settlement. We shouldn't be settling securities in three days." True, but there's no reason.

It's very expensive to add a sovereign computer system it's expensive in electricity. It's expensive in how many transactions you can process and you can only append. There are many ways in which it's expensive. If you don't get the full value of sovereignty, it's ridiculous to suggest that you can get any benefit from adding a blockchain. But to answer your question, the main thing I think people don't get is to what degree we have amongst us a system that is sovereign and people don't realize that that has already happened.

**KEVIN SCOTT:** Yeah, I remember the first conversation that we had about Bitcoin. You mentioned this example from your childhood. We have these crazy inflationary things going on in Venezuela right now. Maybe it's happening in Turkey. This whole notion that Bitcoin is a viable alternative to fiat currencies. Because there are only ever going to be 21 million of them. They all we have been mined by 2040 or so. You can't have a government decide that they're going to get their way out of their poor decision making by just creating more of them.

I don't know why I hadn't had that thought before, but that's really an incredibly powerful notion. And I don't think we've collectively internalized what that could possibly mean for society.

**WENCES CASARES:** I think in Venezuela and countries like Venezuela, are an example that illustrates why there's a different way could be useful. But you don't need that level of high responsibility to need a Bitcoin.

What I mean by this is there are only a very few cases in which I think a sovereign system could be valuable could be more valuable than a central system. I think that for property titles, we're much better off with what we have today. The people involved should use better technology to do things in real time and with open databases, but they don't need a blockchain. They should use some technology that Microsoft already produces and upgrade their systems.

But there are some very few use cases in which probably sovereignty will be a game-changer. Maybe identity is one. I'm not an expert in identity. I am an expert in money. And I do think that money is definitely one area in which sovereignty is a game-changer if we can achieve it. And the way I see it is illustrated by the case of the Venezuelas of the world, but we would all benefit, even in this country.

And what I mean by that is in case of money, a sovereign system, in this case, provides two things that matter: One is you will never have more than 21 million Bitcoin. And you don't have to trust anyone for that. You know that it just is because it's a sovereign system that nobody can change, it will never have more than 21 million Bitcoin. I cannot change it, nobody can change it -- not government, not companies. So, that's one thing. And the other one is it's uncensorable. nobody can keep you from acquiring Bitcoin, nobody can keep you from sending Bitcoin to anyone and nobody can keep you from holding Bitcoin.

Those two things make it so you can imagine a world in which Bitcoin is two things: It's global and political standard of value, and it's a global and political standard of settlement. We have a global and political standard of weight, the kilo or the pound. We have a global and political standard of length, meter, feet, whatever. And we think it's okay not to have a global and political standard of value. And that's wrong.

We should have a global and political standard of value. In a world in which Bitcoin succeeds, it's a world in which when you ask for the price of any currency in the world, New Zealand dollar, you get a response in bits, which are fractions of a Bitcoin. 700 bits. And the Turkish lira, 1200 bits. And a barrel of oil? 5,000 bits. And the GDP of Indonesia? 25,000 Bitcoin. And the global GDP, it's about 1.5 million Bitcoin. And the reserves of the South African Central Bank is 15,000 Bitcoin.

And when your grandkid says, "How did you guys keep track of all of that when you didn't have Bitcoin?" We did it mostly in dollars. But dollars is the currency of one country. Yeah, the most powerful country, but we didn't have anything else so we used that. Wow. And how did you guys keep track of the dollar? Mostly in euros, sometimes in yen. Wow, you guys were sick, yeah. (Laughter.)

It's what we had, right? And there are a lot of things that are lost when you don't have a global and political standard. The capitalist system works in a much better way when you have something that it's a global and political standard of value across time, across geographies. And especially when that is coupled with a global and political standard of settlement. Today, you can only belong to a settlement network if you are a bank -- ACH in the U.S. or Fedwire or CHIPS or SEPA in the U.S. or SWIFT or Visa, Mastercard. You can only belong if you're a bank.

For some reason that I don't understand, they still work during business bank hours and not on weekends. So it doesn't matter if you're Jamie Dimon, nobody in this world can move money on a Saturday. Today, 2018. Money doesn't move on weekends. The guys are playing golf. Like, really? Our grandkids are going to say, "Really?" Yeah.

And my father sells the wool once a year and we live the rest of the year from that one big sale. And he gets paid in 30, 60, and 90 days. All kinds of things have happened to him. Including the money being worth nothing by the time he cashes the check in 90 days. But one thing that happened once is that he cashed the 30-day check and by the time it was time to cash in the 60-day check, the Falklands War started and the buyers were British and they wanted to pay, but all payments between two countries were stopped and it took seven years for him to get that money. Right?

It doesn't make any sense that payments have to be political. It makes sense to have a super low-level network that does what TCP/IP did for information does it for money. It doesn't matter if you're transacting in euros or in dollars or in pesos transactions that either once a day or once a week or once a month at some point get settled in an aggregate manner in a blockchain that we all know it's true that none of us can modify arbitrarily that would be the biggest leap in the democratization of money we had ever seen. And it's now possible because of the Bitcoin blockchain.

**KEVIN SCOTT:** So, really already seeing folks in places like Venezuela using Bitcoin to shelter their assets as their currencies are going wonky?

**WENCES CASARES:** Yes. Bitcoin is a lot more important for Venezuela than Venezuela is for Bitcoin. If you look at all of the Bitcoin activity, Venezuela is a blip. But if you look at Venezuela, It's amazing how many people are using Bitcoin in such a small country. Much more per-capita per smart phone than in other places.

And what's happened is that people in Venezuela are desperately trying to get rid of Bolivares. So there are these informal avenues of driving $100 bills, which is very similar to the way that drugs would get out with little airplanes, with boats, with all kinds of things. But you have those little airplanes driving $100 bills and boats, networks of people. It's a whole sophisticated system that the government has dollar-sniffing dogs, right? It's crazy and really it's rivers and rivers and rivers of $100 bills going to supply this demand for people who want that because they want to get rid of -- But they have to move physically, right? So, people are using Bitcoin because they can avoid all of that. And as an intermediate step, to then get something like a digital dollars or digital euros.

**KEVIN SCOTT:** Really? Dollar-sniffing dogs? That is really, really crazy. So, let's talk about Xapo. Why start this company?

**WENCES CASARES:** I want to dedicate the rest of my career to help Bitcoin succeed. And I think that right now, the biggest hurdles are with ease of use and security. Perhaps in the reverse order. Security, make it very easy for people to use and easy to access. And the biggest hurdle in terms of security is that to put the problem of securing the private keys on a consumer's lap, it's too much to ask. I think it would be very ill advised to tell my mom, "Here, get some Bitcoin," and you take care of this private key. A lot of bad things can happen and they do happen.

So to just make that a black box for the consumer, saying, "Don't worry, you don't even know what a private key is. We will take care of it." I think there will always be a small part of the market that can do that by themselves, and they should. And I think Bitcoin would not be interesting if it didn't offer the capability for people to have their own private keys, but I also think it's important that someone who doesn't want to have that burden can still have access to that. So, that's our main value proposition is forget about this securing private keys problem. We'll do that for you.

**KEVIN SCOTT:** Is that your biggest technical challenge is how you keep these keys secure?

**WENCES CASARES:** I would say at the philosophical level, keeping the keys secure is our biggest value proposition. And, therefore, our biggest challenge. We do that by keeping them offline and a lot of the security is not technological security but just physical security. You have to break into places that are hard to break into. More like Fort Knox.

At the technological level there are some parts that are, of course, technological, but I would say some of our biggest challenges are -- so, yes, I would say at the philosophical level, that's definitely the biggest challenge. On the more practical level, like a lot of companies, we run -- of course we don't keep private keys in the cloud. Almost the opposite. But a lot of our infrastructure runs in the cloud. A lot of it runs in AWS. Some of it in Azure. We use some things from Google Cloud, too.

And I feel doing this company the way I did, starting a bank in Brazil ten years ago, starting a bank in Brazil today would be a lot easier, because you would go into Azure and you just turn on a bunch of modules. And the way I did a company prior to this, we focused on the things where we're really adding value. And a lot of the modules that do not add value are built for us and are run in the cloud and we pay by the minute or the gigabyte or whatever we need to. But going into Bitcoin is like going back in time -- a lot of the super-basic infrastructure, we have to build from scratch and maintain, right? And I had sort of forgotten how much work that is.

**KEVIN SCOTT:** And, like, if you can say, like, what has been or is the most challenging piece of infrastructure to build?

**WENCES CASARES:** There are some people that work with me that would be much more better qualified to answer that question with more being more precise. But, for example, the module that talks to a Bitcoin network, right? How do we know that our transactions that are being sent to the Bitcoin network touch our infrastructure, touch our wallet? I would consider maybe what we do in the cold storage to be proprietary, I wouldn't like to have to turn a module for that. I think that's part of what we do.

But there's a lot of things that happen after that that we have to build from scratch. I don't think we're adding a lot of value, it's just that we need to do it to be in business. But if you could have, for example, one is all of what is interfacing the Bitcoin network, it's a very clear example. Handling transactions -- both outgoing and incoming transactions require handling. It's very different in the case of Bitcoin, the way you handle each one. And a lot of that, I would say, is very commodity work, but we have to do it from scratch because that infrastructure doesn't exist. I mean, a lot of things that if you were a bank, you would never be doing from scratch. Here, you're doing from zero.

**KEVIN SCOTT:** Right. So, what's the most interesting Bitcoin story that you can share in public? I've heard some of the private stories, which are pretty interesting. But you must have seen all sorts of crazy things over the past several years.

**WENCES CASARES:** I don't have one that comes to mind. Every day there are sort of interesting -- we keep track in customer service sort of a top ten crazy things that show up usually through customer service. It's a person -- a techie -- who believes that also bought them when they were maybe a few hundred thousand dollars. And the private key is a mnemonic rule that lives in his brain only. And I tried to convince this friend of mine that it would be good to have some sort of backup because if he dies, all that money basically disappears until you guys figure out quantum computing or something.

**KEVIN SCOTT:** I don't know that quantum computers can read dead brain cells.

(Laughter.)

**WENCES CASARES:** No, but what will happen is that people will start using quantum computing to go after Bitcoins that haven't upgraded their cryptography. And if this guy doesn't do this, that will be one of the addresses. But this guy walks around with a couple hundred million dollars in his brain, basically. It's crazy.

**KEVIN SCOTT:** So, speaking of quantum, are you all using quantum hard crypto to make sure that when the quantum computers come that everything is still reasonably secure?

**WENCES CASARES:** I think that when quantum computer comes, first of all, when quantum computing comes, Bitcoin private key will be the least of our problems, right? I think we're all counting with quantum computing happening not as a discrete jump from zero to anyone can use it to something more gradual where, first, only a couple of very large companies or governments have access to it and then more people.

And to the point where we time to upgrade not only Bitcoin, but HTTPS and a bunch of other things. And that you will being to see most addresses upgrade and you will see some addresses that don't upgrade. And they don't upgrade because they don't have the private key. So, eventually, quantum computing will be used to figure out those private keys.

**KEVIN SCOTT:** So, this is sort of an interesting week for Bitcoin. We've had some fluctuation in the exchange rates. How do you think about the future of Bitcoin, where things are going over the next few years?

**WENCES CASARES:** Current narrative of the market is that ICO treasuries are selling what they had in the treasury, which is mostly Bitcoin and Ether. And that they're doing that because the SEC made these settlements where they forced the ICO treasuries to make their investors whole in dollars, which is news.

And it's an interesting take that people thought that maybe if they were forced to make their investors whole, they would have to return what the investors invested, which was mostly Bitcoin or Ether. They didn't do that. They said, "You have to make them whole in dollars." So a lot of these ICO treasuries are selling Bitcoin mostly and Ether secondarily to cover that they see that as a liability, and they are either getting ahead of the settlement or just hedging a settlement in dollars.

So, that's a lot of selling pressure from a lot of ICOs and a lot of the crypto hedge funds were set up in the second half of last year. The first-year anniversary is coming up and it's getting rid of a lot of lock-ups and causing a lot of redemptions. They also -- selling pressure.

I think more important, even though all of that is true, I think Bitcoin has gone from 9 cents the first time it had a price some serious price with some volume around it was 9 cents per Bitcoin to whatever, 3,000 Bitcoins today. In six very discrete jumps. Those jumps were about a month each, right? Most of the rest of the time it has gone down.

So, for ten years, it has gone down all the time except for six rallies in which it just shot up by orders of magnitude. It's a machine of deceiving people, right? It goes down for most the time, more than 90 percent of the time it goes down, but when it goes up, it goes up a lot. And after these rallies, the last one was in November, I experienced four of these six rallies. And after these rallies, you have to digest all of what happens in that rally, right?

Too many people get in that shouldn't get in. Too many people get in without understanding what they're getting into. Many people put more money than they should into it. So, in these periods after the rallies, I think the best way to think of them is imagine a tree that has a lot of fruit. Some of the fruit is great. Some still not mature. Some is rotten and shouldn't be there. So, you shake the tree, and some of that rotten fruit falls. And you won't have another rally until nothing else falls. And so right now, you shake it and people fall because, oh, my God, I never thought it was going to go so low. Or, oh, my God, this has taken so long, I thought it was going to be a quick flip. Or, oh, my God, I put too much money into it.

When all of those "oh, my Gods" stop and it takes a while -- right now, you shake it and tons of things fall, which tells me we have for a while. In my opinion, we will see new minimums maybe in the 2000s in 2019. And I don't think we will see maximums until 2020. In my opinion, we will see more than 100,000 in 2020.

And I think with Bitcoin, the most important thing is nobody should own an amount of Bitcoin you cannot afford to lose. Because it's an experiment, and as such, it can fail and, in my opinion, the chances of Bitcoin failing are high -- at least 20 percent. So, don't own an amount you can't afford to lose because you may very well lose it. But in my opinion, it has a 50-percent chance of succeeding. And if it succeeds, it's going to be more than $1 million per Bitcoin in less than seven years.

So, it's incredibly asymmetrical. So, you may as well have a very small amount that you can afford to lose in Bitcoin Because if I am wrong, you lose whatever what you were going to spend on a weekend away with your wife. Instead of going away for a weekend, you stay home, you buy some Bitcoin, and forget about it for seven years. Like you spent it. But if I am right, it's going to be 200 times what you put in today. So, $100,000 today, it's going to be $20 million if I am right. If I am wrong, you may lose 1 percent or whatever --a very small amount of your savings. If I am right, I want a grandkid named "Wencito." (Laughter.)

**KEVIN SCOTT:** Yeah. I'm sure that's a deal a lot of people would be willing to make. So, we chatted a little bit about miners. And I think it's just sort of a super fascinating thing. Like Nvidia sort of, purportedly, has a bunch of sort of backed-up inventory because people are investing less in GPUs for mining recently. What are you seeing in terms of mining activity?

**WENCES CASARES:** Bitcoin has been around for ten years. And a lot of questions that you can ask about Bitcoin can only be answered in a speculative manner. But some things we can already answer either with a very factual manner and so with not factual, but quite high degree of certainty.

And I think the mining is one of those where you can quite confidently say, "What we've seen for the last ten years, we're going to see for the next 10 or 100 years." Which is mining will always be about business in aggregate; meaning, more investment will go in than revenues will come out.

That has been the case for the last ten years, and the incentives are so that -- it's like Vegas. And it will keep going on like Vegas. It's like in aggregate, people lose money. People focus on the guys that win, that keeps driving people in. And in aggregate, the miners are spending all of their winnings paying for the electricity, which is what makes me very bullish about Bitcoin, that it will cost more than $6 billion to secure the Bitcoin blockchain this year. And without that, I would not be saying all of what I'm saying here.

I am confident that Bitcoin can succeed because of the $6 billion of electricity. Not because of electricity, per se, but because of what it means in terms of hashing power and what that hashing power means to trust the integrity of the blockchain. So, at the very core, we owe the integrity of that blockchain to the miners, I would not want to be a miner, but thank God they exist.

**KEVIN SCOTT:** Awesome. So, I want to thank Wences very much. Thank you for being with us today, this is a fascinating conversation, and I really appreciate hearing from you and this very unique perspective you have on one of the most interesting things happening in tech.

**WENCES CASARES:** Thank you for having me, Kevin.

**KEVIN SCOTT:** Awesome. (Applause, music.)

**CHRISTINA WARREN:** Well, thanks for joining us for *Behind the Tech*. You just listened to Microsoft CTO Kevin Scott speaking with Wences Casares. And, Kevin, I really loved that conversation that you had with Wences. And I thought it was really interesting, his point about how you really have to have a need to get into blockchain and Bitcoin, and not just to do it because it's the next new thing, because you might as well just use a database in a lot of cases, right?

**KEVIN SCOTT:** Yeah, I think that's one of the things that confuses a lot of people. Blockchain is really a fantastically cool technology. It solves a whole bunch of problems simultaneously. But it solves them in a bunch of different ways with non-trivial cost: securing the blockchain, for instance, just requires a ridiculous amount of compute power.

And the net of that is that you really do need a very good reason to use blockchain. And the reason shouldn't be, "Oh, this is just some cool new thing." Because a lot of things that people want to use a blockchain for, you can do just as easily with a conventional cloud database. So, the thing that cryptocurrencies really need from the blockchain is this whole notion of sovereignty. And I think Wences talks about it very eloquently having the ledger of all of these Bitcoin transactions stored in this sort of sovereign database of transactions is really, really powerful. It means folks can't tamper with it.

You can't have governments doing what governments sometimes do and creating runaway inflation by just sort of arbitrarily issuing more currency. The system has a set of rules that everyone has agreed upon and this sovereignty mechanism is like this binding contract. And the mechanism that makes it this independent thing that whether you or I want to, we can't change the way that the system is structured.

**CHRISTINA WARREN:** No, definitely. And I think it kind of goes back to what we were talking about at the beginning of the show, which is, given Wences's background, where he's grown up, and seeing what he's seen, he has an even better understanding of where this could be really useful and where it maybe can't be and why that sovereignty aspect, like you said, is so crucial.

**KEVIN SCOTT:** Yeah, and it's one of the really interesting lessons I think with some -- actually many -- really great technologists and entrepreneurs. The thing that they end up doing and sort of passionately pursuing sometimes had these roots in these really profound experiences that he had, as you heard in the interview, Wences as an Argentinian, experienced what can happen in these hugely tumultuous economic situations that Argentina experienced multiple times. And so this is a technological way for someone to try to address that problem and to not just solve it for themselves, but to solve it for a broad class of people. And I think it's just super cool.

**CHRISTINA WARREN:** I totally agree.

**KEVIN SCOTT:** All right. So, I think that's it for the show today.

**CHRISTINA WARREN:** Thank you so much for joining us. (Music.)

**KEVIN SCOTT:** Be sure to join us next time on *Behind the Tech*. And, please, help spread the word. Tell your friends, your colleagues, and all of the geeks and non-geeks you know. So you next time. (Music.)

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