Oral History of Steve Kirsch, part 2

Interviewed by:
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Steinbach: Thank you, Steve Kirsch, for coming to the Computer History Museum for the second session of your oral history. My name is Günter Steinbach. So the last time at the first session, we covered your early history, youth and college. We covered the optical mouse and Mouse Systems, and we covered two more companies you founded, Frame Technology and Infoseek. In the case of Infoseek, we did not get to, quite, to how your involvement ended and what became of the company. Can you talk about that?

Kirsch: Sure. We hired a CEO, Harry Motro, from-- he used to work at CNN, and about a year into it Disney came knocking and wanted to acquire Infoseek, and they wanted to merge it with their other properties and call the combined company Go Network, and so the shareholders decided that was a good idea, so we got acquired and after getting acquired Disney wanted to run it their way with their people and so they displaced the current management team.

Steinbach: Oh, Disney. Oh. I would not have expected that. <laughs> But I guess they pushed into digital content and things.

Kirsch: Yeah.

Steinbach: Okay. The next company you founded was Propel in '99. What can you tell us about that?

Kirsch: So that was right at the, kind of, as the internet bubble was bubbling.

Steinbach: <laughs>

Kirsch: And initially it was designed to be a, like, Amazon in a box, that you get an e-commerce site up and running easily, and so we focused a lot of development on that and then the market turned on us and so we laid off a lot of people and we focused on an internet acceleration technology that I had created, and so it enabled people to, with slow lines, to essentially accelerate their browsing experience. And the way that it worked was that we would grab a page from the remote site. We would compress it and we would send the compressed version down to the local browser to be decompressed and what we did was that-- Because a lot of text in pages is fairly common, we had a compression algorithm that would reduce to a hash code, so it wasn't a generic compression algorithm, it was specifically designed to look for patterns in the HTML that would be common across many pages on a site. You know, there's a lot of template code and when you visit the page a second time, that a lot of things on that page are the same and there's only, there might be just minor differences, and so if we could go and figure out a way to difference that off of the hash codes that you already had, then that would be a really powerful technique for compression, and so basically we tried to chunk up the text into sort of manageable pieces that we

thought would be replicated the next time you visited that page, and so even if one byte on the page changed, normally you have to download the entire page, so here you'd only have to download the byte.

Steinbach: If your-- if the customer's browser cooperates by storing the previous page.

Kirsch: Correct, correct. And so the point was that we gave software into the computer, into the user's computer, which would generate and store these hash codes based on the same breaking algorithm as the server, and so the server would basically assume that the user had all of the hash codes and so any hash code that the user didn't have, he would say, "Okay. Hey, thank you very much, but I don't have the following 12 hash codes. Please send them to me." And so therefore on the assumption that most things are the same, then the number of undefined hash codes for a given user would be very small. And so that was the whole premise for how that it worked.

Steinbach: If the user has enough storage space to--

Kirsch: Yeah.

Steinbach: --keep the pages..

Kirsch: And generally that's not a problem.

Steinbach: Yeah, it's--

Kirsch: Right. You know, generally it was the bandwidth that was the issue at the time, and so this would provide a greatly accelerated experience, sometimes two or three or four times faster than browsing the standard way, because we simply could send quite a bit less data and we would not-- If there were, like, 12 requests for a page, that could be done in a single packet and so it wasn't like you had to open up connections and do three-way handshakes each time you download a page, so you save on latency time to set up a TCP connection and you'd also save on the DNS time because you wouldn't have to wait for the DNS and get a response from the DNS and then go to the website, do the three-way handshake and so forth. So there was a tremendous amount of savings by doing it this way.

Steinbach: Okay. And so your servers also would cache pages? To help with that?

Kirsch: Well, no. We didn't have to cache anything. Right. That's the beauty of it. Because the hash codes--

Steinbach: Oh, the customer would cache.

Kirsch: The customers cache it. So I have the world's largest cache.

Steinbach: Yes.

Kirsch: Right. I don't know if they have any expense at all. All they have to do is break the pages in the same way every single time. So if I saw a similar page, as long as my page breaks were about the same, then most of the hash codes would be defined. And so I get away with the world's, you know, fastest accelerator and not have to store anything.

Steinbach: Okay. Cool.

Kirsch: Yeah.

Steinbach: However, with the advent of broadband, that market would shrink, I guess.

Kirsch: Right, right. Because then it's faster to just take the page and download and not do any processing and not even have the latency because the bandwidth is so fast.

Steinbach: Yeah.

Kirsch: So we would see that if you were on a fast internet connection there wouldn't be much of a speed up.

Steinbach: Yeah. Right.

Kirsch: It would only be if you were on a slow connection that you'd see the difference.

Steinbach: Do you remember, did you found that company on your own or did you have co-founders?

Kirsch: For Propel, yeah, there were. There were a bunch of co-founders. But I'm at a loss for remembering.

Steinbach: Okay, and you used venture capital?

Kirsch: Yes.

Steinbach: To set up.

Kirsch: Yeah.

Steinbach: I mean, there isn't much overhead and internet stuff, right, you just need a few servers?

Kirsch: Well, in our case, when we started doing this Amazon in a box stuff it was actually-- we raised a lot of money from a lot of people. Including myself. I put a lot of money in that.

Steinbach: Okay. That's right, then there wasn't a cloud available at that point, you actually couldn't rent computing power from Amazon or Google, right? It's--

Kirsch: At that time, there were services. There were cloud services, you know, like a Rackspace equivalent that you could use, and so that's what we used.

Steinbach: Okay. So when did you end your involvement and what-- is the company still around?

Kirsch: Is Propel still around? No. It sold off its assets to another company and so it's no longer around.

Steinbach: Okay. So your next company you founded in 2005, is that how long you were with Propel?

Kirsch: Yeah.

Steinbach: Okay. And so that next company was Abaca, which was a spam filter company.

Kirsch: Correct. Correct.

Steinbach: So tell us about that.

Kirsch: And so we were looking for domain names. We wanted something at the beginning of the alphabet.

Steinbach: <laughs>

Kirsch: And so we started looking for words that weren't--

Steinbach: A-B. <laughs>

Kirsch: Right. That weren't taken.

Steinbach: Okay. <laughs>

Kirsch: So this, this was a fairly meaningless word.

Steinbach: Yeah. Well, it has a--

Kirsch: It has to do with something about banana or hemp or something like that.

Steinbach: Well, and has a-- to me abacus came to my mind.

Kirsch: Yeah, yeah, yeah. But that's not-- no.

Steinbach: Which is computing--

Kirsch: Yeah, yeah, yeah.

Steinbach: <laughs> Anyway, so what was special about that spam filter?

Kirsch: Well, I was going to retire but I was just getting too much spam and I thought, "Ah," you know, these guys who are focusing on it are focusing on the message and looking at the message and dissecting the message, and I thought that was not an effective approach and so I was looking more about who the sender was and who he was sending it to, and so the content was less interesting. What's

more interesting is who the sender is, what's his reputation and who's he sending his messages to? Because spammers have a unique characteristic that they send to people who get a lot of spam.

Steinbach: Ah.

Kirsch: By and large, right, because by definition if I don't get any spam at all, you're not sending anything to me.

Steinbach: Right.

Kirsch: So I could characterize-- so let's say there are 10 people at a company. I can characterize those 10 people based on the amount of spam that they get.

Steinbach: Okay.

Kirsch: Okay. And once I have that-- and it's kind of iterative, right, because you start knowing nothing and people, you know, start rating things and so forth and so you can-- and you have blacklists and so forth, so you can get a pretty close idea of who's getting the most spam just by looking at IP blacklists. Right. So you now have a range of users. Some people are getting very little spam or no spam and some people are getting lots of spam, and so what you do is you look at the guy, at the sender, and the sender sends to the people who get a lot of spam and, you know, this guy and this guy, but doesn't send to these guys who are fairly hammy, then it's much more likely. And at the extreme ends are spam traps, where if you send to the spam trap, you know, like, this a person who's been dead at the company for, you know, left the company 20 years ago, right? Who's going to be sending them mail? Well, there're going to be mailing lists which are going to be known senders because they would've been whitelisted before or they're going to be unknown senders. So an unknown sender's sending a guy who's basically-- gets nothing but spam. Is pretty darn likely to be a spammer.

Steinbach: <laughs> Right.

Kirsch: Okay. And so when you hit, you know, a couple of those or three of those or four of those, there's no doubt that this guy is a spammer.

Steinbach: Okay.

Kirsch: And so people had been focusing on the extremes to say, "Okay. Fine. If you hit a spam trap, you're out," but what we did is we said, "Okay. There's a kind of a gray zone between people who are--

the spam traps on the one hand, and the ham traps, who get nothing but ham," you know, and that's the easy way to do it. So what we did is we looked at the mathematics and based on the mathematics and based on where you were sending to we could compute even if you didn't send to pure spam traps. We could compute the likelihood that you were a spammer. And so we had a lot more data and so we could do things much more accurately, and so it was virtually impossible to defeat it.

Steinbach: Hm. After some learning time?

Kirsch: Yeah. After, you know, if you send, you take an IP address. Pick a random IP address, completely unknown. Within three or four messages, you're sending to a spam trapper or your odds of, you know, that when you look at the probability that this guy is hammy, if he sent to these guys who are all on the far end of the curve in terms of receiving mail. After you've sent about 5 messages or 10 messages, you're done.

Steinbach: Yeah.

Kirsch: You know, and so then it's like, "Okay. Gee, I better pick a different IP address or a different sender," and so you're always caught then trying to find a new IP address and generally we look at IP blocks and we have reputations on the IP blocks to say, "Oh. Fine. This one is available," because it's coming from China and so forth, and so that's going to-- just starting off-- we'll probably say, "Hey, look. You know, we put it in the quarantine." We might put it at the top of the quarantine because we're not as sure as if you're-- to sending more but because its IP range is associated with spammers more than people who send ham, then we could go and have our initial assumptions based on the mathematics. What's the a priori? If you know nothing other than it came from this IP range, ah, probable 52 percent spam, right, and so you put it in the quarantine but you put it at the top and so we had a ranked quarantine based on probability scores rather than, "Oh, this text looks similar to a text sent by a spammer," and so we could get very accurate probabilities and the beauty is that when you looked at your quarantine it was a sorted quarantine based on the probability that this is a spam, and so that makes it much easier, because instead of like right now, when I have my spam filter with Microsoft, it's like, "Okay. There's stuff that makes it into your box and then there's the clutter and then there's the quarantine." But it's not ranked.

Steinbach: Yeah.

Kirsch: Right. And so you have to go through every single fricking message to go and find out where the spam is.

Steinbach: So did you look at content at all or not at all?

Kirsch: Yeah. Because we could look at-- some content was known to be, like, links and text ranges and so forth when-- could also have an association with them that, “Oh, any time you see the words this, this and this, together--“

Steinbach: Nigerian ministry or something. <laughs>

Kirsch: The only time you see that combination is in a spammy message.

Steinbach: Yeah.

Kirsch: Right. And so even if you were obfuscating by having these techniques where you would encode the text into whatever and stick in random stuff, the fact that you were sending out weird combinations was an immediate trigger and so we used, we did use the content. We used where it was coming from and so forth. You basically couldn’t get through it.

Steinbach: Oh.

Kirsch: It was like, you know, we had, like, five nines in terms of the accuracy of the spam filter and we tried to approach bigger companies like Microsoft and so forth. Got nowhere. Couldn’t get to first base. Was like, “Not invented here.”

Steinbach: Yeah.

Kirsch: Even though it was brilliant and the most effective spam filter ever, so…

Steinbach: Yeah. I guess they-- yeah, not invented here. I just the other day pulled a message out of the Google spam folder that came from somebody who had, I had received mail before, but apparently because of the content pattern, it must’ve flagged it.

Kirsch: Right. So I think we probably didn’t do an effective job marketing it in terms of that, “Hey, look. We’ve got a ranked quarantine.” Right. Because that’s a huge differentiator and it just saves you a lot of time because you really don’t want to have to go through and spend the time to go through your spam folder.

Steinbach: Right.

Kirsch: And yet you have to.

Steinbach: Yes.

Kirsch: Because you're looking for that, "Oh, shit. There's a really important message and it's caught in the spam."

Steinbach: Right. That's what I do.

Kirsch: So you're stuck.

Steinbach: Yeah. Six hundred messages in one--

Kirsch: Having to go through all this--

Steinbach: --month and--

Kirsch: Yeah. Well, it's just--

Steinbach: --what do you do?

Kirsch: It's all a waste of everyone's time.

Steinbach: Yeah.

Kirsch: So Proofpoint acquired the technology.

Steinbach: Okay. What's Proofpoint?

Kirsch: And has incorporated into Proofpoint spam filtering.

Steinbach: Okay. So that's another spam filter company.

Kirsch: Right. Yeah. And David Fuchs was one of the key engineers on making that happen.

Steinbach: And that was, you marketed it to companies or to individuals?

Kirsch: It was sold to companies.

Steinbach: Okay. As a company-wide spam filter.

Kirsch: Yeah.

Steinbach: And again, with venture capital?

Kirsch: Yeah.

Steinbach: Okay. And in that case you wouldn't need much in the way of your own servers and things, right? You would sell the software or license the software to your customer. Or did you have your own servers that--

Kirsch: Yeah.

Steinbach: Oh, you probably want to consolidate different customers, right?

Kirsch: Yeah. Yeah. Yeah, yeah. So we had the ability to be a cloud service as well as on site.

Steinbach: Okay. Okay. And was it, again, did you have co-founders and do you remember them?

Kirsch: Yeah. David Fuchs was an early employee, so he was extremely helpful and there were few others. Eric Brown.

Steinbach: Okay. So then your next company was OneID in 2011.

Kirsch: Yeah.

Steinbach: So you stayed with Abaca for those six years?

Kirsch: Yeah.

Steinbach: So tell us about OneID.

Kirsch: So OneID is under the frustration of usernames and passwords. Everybody, half the people, use the same password on every site. It's a security nightmare, and to have to use two-factor auth is a pain in the ass, and, you know, today even Google has a, really does a lousy implementation of two-factor auth. Like, I'll go and it will bother me like every couple of days and say, you know, "Re-login to Google." Why? I'm not under attack. My account has not been breached.

Steinbach: But do they know that?

Kirsch: But I actually don't-- prefer not to be bothered by that and I would much rather say, "Oh, you got a weirdo login. By the way, we didn't block it or anything, but…" and then I could say, "Okay. Set my danger threshold to higher." But hey, they treat everybody the same. Right. Even though I don't really care if anybody gets the information that I'm working on, because our secrecy is not about the secrecy of our information. So I don't really care. I would rather not be hassled by, "Oh, you're offline, and so sorry, you have to login and you can't because you're currently offline, and the software says you have to login." Well, that's no good, and plus, it's just a pain. You know, we have to go and then login and if you're-- want to be safe you'd use a two-factor auth and do that, but where is the-- they do it just based on time, right? "Oh. Let's just bug the guy every couple of days to login." Instead of, "Oh, this guy's coming from a new IP address," or, "This usage pattern is different than his usage pattern." Like, why aren't we using smarts to figure out, "Oh. I think there might be a problem here, so therefore I'm going to increase the level of assurance that it's really the person." And so we typically get really dumb stuff in terms of authentication. Where if you login to the bank, "Ah," they assume you're a crook, right? I mean, I spent an hour trying to get into my Verizon account. They said, "Okay. Do this. Now do this. Now tell us the answer to this question. Okay. Now that you've got that, tell us the billing zip code." Well, my company's moved like six times.

Steinbach: <laughs>

Kirsch: And, you know, so I'm entering the zip codes and, you know, and for whatever reason, I get it wrong. Now I'm locked out. Now I have to call them. Now I have to re-authenticate. Now they have to unlock my account but they can't. Ah. Great. They say they reset my account. Now my new password is sent to my old e-mail at OneID, which no longer works.

Steinbach: <laughs>

Kirsch: Okay. So no problem. So I call them up again and now I have to change the e-mail address to the current e-mail address. But, "Sorry. As a security precaution, we don't allow you to reset your password-- If you've changed your e-mail address, then it takes 30 days before you can reset your password, because we want to make sure…" Okay. So how many people are out there stealing Verizon accounts so that they can change the plan?

Steinbach: <laughs>

Kirsch: I mean, are you serious? I can't, you know, it's like the security guys who come up with this is like, "Oh, protect the company, protect the company." From changing my plan off of my $50-a-month plan onto, you know, because I was trying to change it to-- $50 to 15. Now, how many, how much fraud, do you think there is of people breaking into people's Verizon account to change their plan so they can save money? I mean, there must be a lot of fraud in that because, shit, I had to go through an hour of authentication just so I could change my plan to a cheaper plan.

Steinbach: <laughs>

Kirsch: So anyway, identity is broken. It's been broken for a long time. We need to get rid of usernames and passwords. That's 50-year-old technology. You know, I talked to a-- I was on an airlink at JFK yesterday and the guy sitting next to me is a software engineer from Google, and so I said, "Well, you guys should get rid of usernames and passwords. You should just be using, you know, cryptographic digital signatures." He says, "No, no. I believe in practical security."

Steinbach: <laughs>

Kirsch: Like, "Okay. But yeah, I believe in practical security too, but security is all about tradeoffs between what the risks are and the convenience for the user. And more often than not we go way overboard on, "Oh, let me get--" you know, "Make sure your password has enough--" you know, one digit and, you know, blah, blah, blah. Come on. You know, "Anything that you're going to--"first of all, you're going to use the same password everywhere, okay, and they're not going to be able to prevent you from doing that because they don't know--

Steinbach: They don't know it.

Kirsch: The same password anywhere, so-- and stuff, the stuff is easy to crack, right? Because unless your password's like 23 characters, your password's toast. You know, even if it's got one letter, one digit, and they're not going to require people to have-- "And make sure your password is at least 23 characters and 6 digits," and blah, blah, blah, because nobody's going to do that, and so it's completely false sense

of security and nobody should be doing that anyway, because the fact is that nobody's going to remember 400 different passwords. I have trouble remembering just, you know, a couple. So it's a completely broken system and there is a better way to do it and so that's why we started OneID.

Steinbach: And is it--

Kirsch: And failed to get websites to adopt it. You know, and that, that was the amazing thing, right, because people hate usernames and passwords. The consumers do. But the companies, they just look at that as saying, "Oh, people are used to that," and they don't care.

Steinbach: They don't care.

Kirsch: And, you know, we couldn't find a company to implement this to save our lives and that was the really surprising thing. With all of the problems of usernames and passwords, it's so ingrained that it would be like taking away people's internet or something. You know, even if you're replacing it with something better it's a-- it was just really surprising, right, because I thought that this would be, "Okay, the world would beat a path to my door on this one." Because it's a simpler, easier, more secure way to authenticate.

Steinbach: Well, when you say--

Kirsch: I mean, you basically, you press a button and you'd enter in your e-mail address or some identifier for you, you know, that-- and it could be your OneID ID name, like Steve, or it could be your email address or your phone number. Something that's associated with you. It could be anything that you associated with your identity and then it would just pop up on your phone and you would click Okay and you're done and that was it. Yeah. Really simple, and it's secure because it was digitally signed in the phone. There's a secret in the phone and it's a cryptographic secret so it was actually cryptographically signed. So simple idea as two-factor auth because you have to have the phone, which is possession. You had to be able to unlock it, which is the second factor, and so all you're doing is clicking Okay.

Steinbach: Okay. And your device communicates with…

Kirsch: Yeah. And, you know--

Steinbach: With the other side.

Kirsch: --the protocols were designed by cryptographic experts such that there were-- if somebody broke into OneID, they're not going to, like, steal everyone's identity. Because the crypto keys were fundamentally kept at the end points.

Steinbach: Mm-hm.

Kirsch: So it was end-to-end secure. It's not like PKI, which if you breach the servers. In PKI, you know, the certificate authorities. You break into one of those, all bets are off. It's not an end-to-end secure system. So our stuff was designed not to use anything that wasn't end-to-end secure. So if you broke into OneID you couldn't compromise anyone's identity.

Steinbach: Okay.

Kirsch: You break into Google, you've compromised everyone's identity. Because it's all shared secrets. The whole thing. Even a two-factor auth is shared secrets, so…

Steinbach: Right. You get the person's phone--

Kirsch: Yeah. You know, once you've broken into Google, you know, you can fake the authorization for any Google user.

Steinbach: Now, when you--

Kirsch: So it's not-- it's a horrible federated identity.

Steinbach: When you said people didn't want it, that was companies that didn't want it.

Kirsch: Yeah, the companies. Companies. Right.

Steinbach: Because the end users--

Kirsch: Users, end users loved it.

Steinbach: They use what they're told, right?

Kirsch: Yeah, yeah, exactly. Or what they can use. What they could use.

Steinbach: They did not-- I don't think they would complain. Now, you need an application running on the user's device; is that true?

Kirsch: Yeah. You need-- no. Because we had it all running in the web browser.

Steinbach: Okay.

Kirsch: So you didn't need to have an app. We had an app on the phone that was used for the-- to confirm, you know, who you were.

Steinbach: Okay.

Kirsch: So you needed-- yeah. Yeah.

Steinbach: Like on a home computer--

Kirsch: Yeah.

Steinbach: --it would be in the browser, so you just need a modern browser.

Kirsch: Yeah, yeah, and in most cases, unless you needed the extra assurance, we would drop a key on the user's browser so they wouldn't have to use their mobile phone. So they could just click in and click, "Hey, I'm Steve and I'm in."

Steinbach: Okay.

Kirsch: And if they wanted to they could have a, like, a PIN code. But the PIN code wasn't a shared secret. The PIN code was used to hash against a local secret, so you take the PIN plus hashing it with a local high entropy secret and that would be used to sign the transaction to get in, so if you broke into OneID it's not like you get, we have, all the four-digit PIN codes or that someone could ever break into your account. So nobody could ever guess your PIN code. Like, I could have 1111 as my PIN code and it didn't matter. I could tell you that my PIN code was 1. But unless you had my device, right? And then-- but so, you know, if my device got stolen, then somebody has to come up with a four-digit PIN and the server only gives them, like, four guesses. So the chance that they're going to hit your PIN is next to zero

and they can't-- every time they try they have to do it against the server. So they can't do a brute force attack. So it was extremely simple for users.

Steinbach: And since it's in the browser it would run on any operating system.

Kirsch: Correct. Yes.

Steinbach: I'm running Linux at home--

Kirsch: Yes.

Steinbach: --and so some of these things don't completely work.

Kirsch: Yeah.

Steinbach: Like my son made me use 1Password. It's a new service.

Kirsch: Yeah. Yeah, yeah, it's horrible.

Steinbach: And it's--

Kirsch: It's horrible. It just, it's a crutch to enable us to keep using technology that's 50--

Steinbach: To keep your usernames and passwords. <laughs>

Kirsch: --50 year-- yeah, yeah. It's, it's horrible.

Steinbach: Okay. So do you remember the co-founders or money sources for that?

Kirsch: Yeah. Khosla Ventures and… Dang it. I'm blanking on the other VC.

Steinbach: Okay.

Kirsch: And on OneID, Jim Fenton was one of the co-founders of that.

Steinbach: And you said nobody wanted to buy it, so did you wind that down then?

Kirsch: It was sold to, off to another company. Let's see. Gosh. I always blank on the name of that company.

Steinbach: <laughs> It's okay, so… But anyway, the technology lives on--

Kirsch: Yeah, yeah, yeah, yeah, yeah.

Steinbach: --in another company.

Kirsch: Yeah, yeah, yeah. But for IOT.

Steinbach: Okay. Oh. Yeah. And--

Kirsch: Which is really a shame, because the problem is still unsolved.

Steinbach: Right.

Kirsch: Authentication is still using 50-year-old technology and the guys who are breaking it are using modern technology. It's not even a close call, and it is just brain dead silly that-- and I try to interest the government and, you know, you get referred by, "Oh, you should talk to this person, this person, this person." Finally, you know, all roads led to this one person and that person just wouldn't return any of my calls.

Steinbach: <laughs>

Kirsch: Right. I mean, it's like, it's almost like there's a conspiracy to make sure that we-- it's almost like the criminals control, you know, all these companies and so forth to make sure that we don't get better authentication.

Steinbach: And but you don't think they could catch up with that?

Kirsch: No.

Steinbach: The criminals.

Kirsch: No. No. Was very, very well designed. You know, and almost the problem was that if you explained it to someone you had to be a cryptologist to understand how it really worked and why it was secure, and if you weren't it was like I'm talking, "Oh, and this key, talk to this key, which--" dada-dada-dah, and it sounds like gibberish.

Steinbach: Ah. <laughs>

Kirsch: Right. Sounds like I'm a mad scientist.

Steinbach: <laughs> Okay. So that gets us to your most recent venture, which is Token, founded in 2015.

Kirsch: Yeah.

Steinbach: What's Token about?

Kirsch: So Token is to provide banks with a platform, open banking platform that developers can then use that to write applications. So for developers we present a single API across all banks and for banks we present an operating system that can be used to expose the bank to developers. So you can think of Token is to a bank what Android is to a mobile phone manufacturer.

Steinbach: Oh, okay.

Kirsch: That's the simplest way to, you know, or what Microsoft Windows is to a PC manufacturer.

Steinbach: Okay.

Kirsch: So we're kind of like the gateway between the bank and the developer and so we translate developer code into bank speak and, you know, so we're middleware between a bank and a developer basically.

Steinbach: Okay. So an operating system, you call it. So to run--

Kirsch: Yeah. I mean, you could think of it--

Steinbach: --the enterprise on basically or…

Kirsch: Well, you have a bunch of API calls to say, "Hey, push funds, pull funds."

Steinbach: Okay, okay.

Kirsch: Dada-dada-dah. So you have a set of functionality that's unique to banks, in the same way that an operating system would have functionality that's unique to the PC, like, "Print this," or, "Get this off of the local disk."

Steinbach: Mm-hm. And… But there are things that are common to all companies like, "Deal with this customer." Right. "Get this customer's records," which you also have to handle then, right? Or would they have somebody else's software handling that?

Kirsch: Yeah. No, no, no. No. The point is that you would use our software to interface to the bank.

Steinbach: Okay. And so that is-- well, I guess when I read through your list of companies I thought that was the point where you went away from the individual customer but that's not true. You actually even Abaca already, you said, was selling or trying to sell to companies.

Kirsch: Correct.

Steinbach: Right. So--

Kirsch: Right.

Steinbach: Yeah. Did you-- how do I ask this? What's the big difference that you see between selling to individuals and selling to companies?

Kirsch: Well, I mean, there are two different types of companies that do that, so you approach it differently. I mean, you know, for consumers it's more about mass marketing, for companies it's about

targeting and figuring out who you're going after and engaging with them on more of a one-to-one basis where it's impossible to do that consumer basis. You have to-- it's more one-to-many in consumer versus more one-to-one on a corporate sale.

Steinbach: Okay.

Kirsch: Right.

Steinbach: Which means--

Kirsch: Where you know who each customer is and what their needs are and you're working with them and meeting with them over and over and over. You can never do that with a consumer product.

Steinbach: So you need different people, like different salespeople.

Kirsch: Yeah.

Steinbach: Right. I mean--

Kirsch: Different, yes. Yeah. And it's a different sales approach, right, because for consumer products it's more about marketing.

Steinbach: Mm-hm. Okay. And who were your co-founders for Token and your investors?

Kirsch: So Token. Let's see. Yobie Benjamin, former CTO for Citigroup. Hilary Grant-Valdez, and Peter-- blanking on his last name. Ah. Let's see if I can find him. Mm. Ah, Peter Potts.

Steinbach: So these are banking people?

Kirsch: Yeah. These people had banking backgrounds.

Steinbach: Okay. Okay. And Token is still going on and you're still involved with them, right?

Kirsch: Yeah. Yeah, we raised 18 1/2 million and have about 35 people in San Francisco and London.

Steinbach: I would assume that it's pretty hard to get a bank to switch to a different operating system.

Kirsch: Correct. Yeah. It's pretty hard for a bank to make a decision to do anything. <laughs>

Steinbach: Right.

Kirsch: You know, they're--

Steinbach: The stakes are high.

Kirsch: --very conservative. Used to slow decision-making. They get hounded by thousands of intechs who want to do business with a bank. They have to narrow their focus with who they're dealing with and then it's like 20 to 50 to a hundred people have to get involved in making the decision, so it's ridiculous.

Steinbach: <laughs> Okay. All right. So we are, we're through with the list of companies that you founded, and I was looking at your homepage and you do-- I was looking at the awards you got and was surprised that prominent was awards for philanthropy, right. For not just giving money to causes but for proselytizing others to give money, and I read through a slide show that you made about I think donor-directed charitable funds. Can you talk about that?

Kirsch: Ah, sure. So I've been doing giving for a very long time and I was involved in one charity which I thought was a pretty good organization and they drafted me to go and ask people for money. And so I was being coached by Leonard Ely, who's a very famous guy, and so I asked Leonard, I said, "So how do you go about asking people for a million dollar donation? I mean, why would they want to do that?" and so he said something to me that I'll never forget, which is, "You know, some people want to give money away," and that had never occurred to me before. I always thought, "Ah, you got to separate the money from the person and it's always a struggle and people don't want to give you money and you have to convince them to give you money." But Leonard's position was correct in that people actually have an interest in getting something done and they want to deploy their capital to achieve that goal and you're actually doing them a favor by exposing them to something that's going to help them achieve their goal. So for example, suppose I have diabetes. I would be interested then in finding a cure for diabetes because it personally affects me. And so if I came to you and I said, "Hey, I've got this super-credible project that can do this," then you're saying, like, "Great. I'd love to help, because it affects me and if this is successful, you know, I've got more money than I really need for, you know, I got the private jet, I got the, you know, homes in three different places and--" you know, after the first hundred million, right?

<laughter>

Kirsch: You know, it's like you don't really need that much to live on and to have a really good life, and so then it's about, well, how do you improve your own life by giving the money away to better your own position and also the position of other people because you've cured cancer or you've cured some disease? And so once I looked at it that way then I said, "Ah," then, you know, I had a whole different look on philanthropy as, "Hey, if you're going and asking people for money you're actually doing them a favor if you're giving them an opportunity to invest in something that's going to make a, or has a good shot at making a difference in their lives." And so the reason I do it is because I invest in things like diabetes and glaucoma and Waldenstrom's and so forth. These are all diseases that I have that are going to help me but they'll also help other people and so it kind of makes sense, right, because you're helping yourself. So, you know, in some sense you're not doing it out of pure altruism, you're selecting where you donate your money because I could donate to some cause. In fact, I donated to glaucoma 20, like, at least 20 years before I developed glaucoma, because it was recommended as, "Hey," that, you know, "we can actually make some progress in this area. It's a debilitating disease," blah, blah, blah. I had no family history of it and I gave to it because I thought it would be a useful use of money to try to make the world a better place. Twenty years later it turned out that, "Oh, gee, how did you know you were going to get diabetes 20 years later?" You didn't. You just happened to be in the right place at the right time, and so sometimes when you give out money it can, you know, it'll end up, it can end up helping yourself down the road. So if you gave to, say, cancer research today, hey, who knows whether you get cancer? Or, you know, heart disease, whatever. I think that if people really wanted to be altruistic that doing ads on television to tell people about the-- that the recommendations of the government are just awful in terms of foods, and it was the, you know, the government basically created this war on fat and what that meant was you took the fat out and you put sugar in.

Steinbach: <laughs>

Kirsch: And so you went from something that was actually beneficial, which has been in the human diet for forever and you basically said, "Hey, we're going to make America healthier by telling them to drop the fat." You know, so everybody's saying, "Hey, this has no fat," and all this stuff. Ah, they just bump up the sugar. Right. And it's the sugar that's the dangerous thing, right, because sugars have fructose. Fructose, if you eat too much of it, turns into belly fat, and that just accumulates in your belly and people get fatter and fatter and fatter and they can't lose it because that fat is protected, and very few people know how to get rid of it. And so we have this health epidemic which has been created by the government. You know, with all good intentions. I mean, they thought they were making America healthier, and in reality they are the biggest instigator for the problems of diabetes, obesity, metabolic syndrome, you know, all this stuff is all because of U.S. government intervention into telling people to, you know. So anyway, I'm kind of getting off on a tangent.

Steinbach: But it's not automatic that you reduce fat and you increase sugar, right?

Kirsch: Well, what happens is if you take the fat out, then the taste disappears, and so you need to make it taste good, and you don't want to add fiber because fiber-- well, first of all, fiber doesn't taste like anything, and the second thing is that they don't add it to the food because it decreases the shelf life and it makes it longer to cook, you know, and so you look at the quote "properties," you don't care about the person's health, you care about what their experience is.

Steinbach: Right.

Kirsch: You know, and so it's this vicious circle that leads us to a diet which is killing us.

Steinbach: Hm.

Kirsch: So anyway, if you, you know, and yet who is the philanthropist who is stepping up to the table? You know, like, this would be a great thing for a billionaire to go and say, "Hey, look. I can make a difference in the lives of hundreds of millions of people or billions of people by educating people to correct the mistakes that the government has made." You know, they, like, we should have a label on what the fructose content is on, you know, that's really, really important because that turns into the belly fat which is super dangerous, causes diabetes and all this stuff. And yet because of the lobbies and so forth, it's not broken out.

Steinbach: I guess it's not, but carbohydrates are broken out, right?

Kirsch: Carbohydrates are, but carbohydrates in general are pretty good because they'll just turn into fat in overall in the body. It's the fructose that's only metabolized in the liver that if you eat too much of it in a single meal will turn into belly fat.

Steinbach: Oh, I didn't know that.

Kirsch: Yeah, no. Nobody knows it.

Steinbach: <laughs> I guess.

Kirsch: That's the problem.

Steinbach: Yeah.

<laughter>

Kirsch: You know, and that's why you see, you know, and nobody knows how to get rid of it once they have it, which is why people, you know, you look at people and you see like half the people are obese and, you know, they got, you know, stomachs and, you know, I was the same way. I could not figure out how to lose my belly fat. You know, and I read all these articles. "Oh, you should eat right," and all that. Bullshit. That won't work. This stuff is protected. There are these alpha2 receptors that you have to disable if you're going to go tap into that belly fat, because it, the belly fat is completely different than your subcutaneous fat.

Steinbach: Oh.

Kirsch: It's-- yeah. So--

Steinbach: Oh, really?

Kirsch: You know, and so the point is that nobody gets educated on this stuff and so we have a population which is, you know, overweight and unhealthy because the government has actually exacerbated the problem. You know, and Michelle Obama's saying, oh, you know, "Get active," is all bullshit, because it wasn't, you know, we never had a problem before we told people to drop the fat. We never had a problem.

Steinbach: Well, didn't we?

Kirsch: No. No. People were extremely healthy. Before the government intervened to help people, we were extremely--

Steinbach: When was that?

Kirsch: Very, very few-- you know, the rates of diabetes or metabolic syndrome. Vanishingly small in comparison.

Steinbach: So when did the government--

Kirsch: Childhood obesity. You know, you have, like, these six-month-old kids.

Steinbach: Right.

Kirsch: Six months old, right, and they're fricking obese. How is that happening? It's happening because the government wanted to help people. And they never corrected that and even after they realized the mistake they still haven't gone off and said, "Oh, we screwed up. Sorry about that. We screwed up. We shouldn't have told you to drop the fat. It's the sugar that's the killer. Look at what your sugar intake is, get rid of added sugars and make sure the fiber is high." None of that gets out. Nobody knows that, and which is why we have the problem that we have.

Steinbach: When did they start with low-fat thing?

Kirsch: '70s.

Steinbach: '70s. Oh.

Kirsch: The '70s.

Steinbach: Okay.

Kirsch: Yeah.

Steinbach: Pretty late. I mean--

Kirsch: Yeah. You know, yeah. But, you know, you can look at the, you know, obesity, the diabetes. All started at the same time.

Steinbach: Hm. Wow. I learned something.

Kirsch: Yeah. <laughs>

Steinbach: So…

<laughter>

Kirsch: It's all fascinating but, you know, so there are lots of things that if you're a philanthropist you can make tremendous difference in people's lives.

Steinbach: Well, with a lot of money.

Kirsch: With a lot of money. Yeah.

Steinbach: Right.

Kirsch: Yeah.

Steinbach: If you don't have a lot of money…

Kirsch: Yeah. It's hard. It's hard to move the needle.

Steinbach: Then-- yeah.

Kirsch: But there are people who have billions and billions of dollars that could make a meaningful difference in the lives of billions of people. By having, you know, little commercials that educate people on, "Hey, it's not the fat. It's the sugar." You know, "Pay attention to the sugar and minimize the amount of sugar that you have in any one sitting to allow your body to assimilate it, and here's how you can lose belly fat." You know, and if you just corrected the evils of, "Fat is bad." If you just did that one thing, and said, "Hey, there's no problem with fat," and, you know, "Carbs are okay too. The sugar's another story."

Steinbach: Hm. Okay. <laughs>

Kirsch: High fructose corn syrup, all that stuff. Yeah. So, I mean, you know, there are lots of opportunities, you know, and this was, this is just one of them that happens to be on my mind because it affects so many people in devastating ways. I mean, if you have diabetes you can lose limbs and people seem to prefer to have a lost limb than to take the diabetes medicines and the diabetes medicines are terrible anyway, you know, and we treat diabetes the wrong way. You know, with drugs that will, you know, can kill you. Give you pancreatitis and so forth.

Steinbach: I thought you just take insulin.

Kirsch: Yeah, you can do that. Yeah. And insulin's probably-- insulin's the safest way to treat diabetes, but the doctors don't like to prescribe it. I mean, when I got diagnosed it was like, "Oh, shooting insulin? Nah, it's like the last on the list."

Steinbach: Really?

Kirsch: Yeah. Even though that's, like, the obvious thing to do. Yeah. Really, you know, it's like, "Oh. People don't like to stick themselves or so forth." Yeah. But that's because you haven't educated them on, you know, these needles are like nano-needles. They don't hurt at all. I mean, you can't really feel them when you inject and… But if you fix your diet, you get rid of your belly fat, and if you had diabetes, you can get rid of it. You know, unless you're really all the way gone. Exercise helps tremendously.

Steinbach: In some kind of diabetes, I assume. The ones that you acquire later in life, I could see--

Kirsch: Yeah, Type II. Type II you can get rid of.

Steinbach: Yeah. If it's--

Kirsch: Type I, that's another story.

Steinbach: Yeah. If you have inherited it, that's probably diet will not cure it, right?

Kirsch: That's right. Yeah. Type II is the, you know, I mean my blood sugar was 130 and my blood sugar's like 65 now, which is amazing difference, and that's with no drugs.

Steinbach: By diet and exercise, I assume?

Kirsch: By diet and exercise.

Steinbach: Hm. Very good.

Kirsch: Yeah. Intermittent fasting and so forth. Just makes it-- and got rid of all my belly fat. Just makes huge difference.

Steinbach: Huh. Very good.

Kirsch: So this is now not the Computer History Museum interview.

Steinbach: <laughs>

Kirsch: This is the…

Steinbach: It's okay. It's your history.

Kirsch: Yeah.

Steinbach: Right. It's your history and your opinions that we want to hear.

Kirsch: Yeah. And so look, if anyone is actually watching this and listening to all of it, please <laughs> send me an e-mail. I want to know.

Steinbach: Okay. Yeah.

Kirsch: That this made a difference.

Steinbach: I recently got an e-mail from somebody commenting on one of the videos that went on on YouTube. YouTube seems to me, I mean, that's the most accessible place probably, right? You search for something and you get--

Kirsch: Yeah, yeah. But there's, you know, so much content. So it's, you know.

Steinbach: So after I sent you my questions yesterday, I actually went back to your homepage and I found some other things that really kind of caught my eye. One of them was you make a pretty convincing plea for building nuclear reactors.

Kirsch: Yeah.

Steinbach: Especially the integral fast reactor.

Kirsch: Right.

Steinbach: Breeder reactors. And yeah, you want to talk about that?

Kirsch: Oh, sure. I used to be anti-nuclear, because people who were advising me told me, "Oh, nuclear's bad and you don't need it." And, you know, so I came to discover on my own that, "Oh, nuclear's actually really good and it's really the safest form of power." If you look at the number of deaths caused by nuclear it's minuscule compared to any other form of power, and so why aren't we using it? Well, it's like fear. And there's this joke about nuclear radiation, that if the radiation comes from background radiation and it's natural, then it's okay. But if it comes from a nuclear reactor, then it must be evil. It's the same stuff, and turns out that there's a hundred times more radiation from a coal plant. A hundred times more radiation out of a coal plant than out of a nuclear plant.

Steinbach: In the smoke or…

Kirsch: Yeah. Yeah. Yeah.

Steinbach: Yeah.

Kirsch: And so what does our President want to do? Yeah, want to increase in the number of coal plants. Think there's any mass protests about doing that? Ah, not really. You know, coal miners like it, dada-dada-dah, but--

Steinbach: Even though they die.

Kirsch: But, you know--

Steinbach: <laughs>

Kirsch: --but you see these guys protesting nuclear plants as being unsafe even though the coal plants--right. When was the last time you saw a demonstration outside of the coal plant saying, "Hey, these are a hundred times more radiation from a coal plant than a nuclear plant. We should shut down the coal plants," from nuclear? How many times you see, you know, demonstrators do that? None. They don't know. In fact, they, the demonstrators, they give out bananas at the, you know, to the demonstrators who are demonstrating against nuclear radiation. Well, bananas have more radiation in them than most other things. Like, it's like, you know, your--

Steinbach: Really? <laughs>

Kirsch: Yeah, yeah, yeah. The radiation from a banana's actually fairly, you know, significant on a, you know, it's still insignificant but it was kind of ironic. You know, we look at that and we say, "Ah, they're giving them bananas," right. It's just kind of funny. Right. If you really understand it, you know, and the radiation levels we're talking about, people think that, "Oh, any radiation above zero is bad for you," but in fact the studies are that there's kind of a safe zone where radiation can be really helpful in getting rid of the mutations which are more sensitive to radiation. And so this background radiation that we're all exposed to is actually a beneficial thing because it helps to kill off the mutations that would have a tough time surviving and so it ends up being helpful. So you look at Chernobyl and so forth and, you know, nowadays it's very, very safe. But anyway, you know, nuclear's gotten a bad rap. It's gotten a very unfair bad rap, and the climate change really requires us to come up with a source of energy which is zero emission which can be scaled and runs 24-by-7. Nuclear fits that bill to a tee. There isn't anything else that comes close to it and it shouldn't be ruled out of the mix. Should be part of the mix, and if we were really serious about it we could go and figure out how to get the cost down and turn these things out in mass production and so forth and we'd have a much better society because of that. Because the pollution in China and other countries is going to kill us all.

Steinbach: Now, one of the statements in that article was that these breeder reactors are so safe because they simply stop working when everything breaks.

Kirsch: Yeah. That's right. Yeah, so there's no cooling leak or whatever like there was in Japan. Instead of the whole thing, you know, the reactor, getting, you know, overheating and exploding and, you know, whatnot, the thing that just shuts down, because of the design, and so it's an inherently safe design. So they ran the Three Mile Island scenario and so forth. The reactors shut down.

Steinbach: Now, I was going to ask you about that because most of the things cited on that page were written before Fukushima. So you are--

Kirsch: Same thing would've happened. It's no different. I mean, Fukushima was, reactor was designed, like, 50 years ago. They shouldn't have put the generators in the basement. You know, so there were some design mistakes. But this is not, this was definitely not a next-generation sodium fast reactor. The sodium fast reactors are not under any pressure at all. If there's a problem, the thing just shuts down.

Steinbach: Well, if there's a breach, your sodium would--

Kirsch: Catch fire, but the fires are--

Steinbach: Catch fire.

Kirsch: --yeah. But the fires are easy to-- if you understand how to deal with them they're easy to put out, and the beauty is that the coolant's not under any pressure.

Steinbach: Okay. And it wouldn't be, the fire wouldn't spew radioactivity?

Kirsch: No.

Steinbach: Okay. Yeah.

Kirsch: I mean, you really have to look at the safety track record of these reactors and you have to look at certain doom that we're facing right now with global warming. It's not even a close call. If you look at it rationally based on facts, based on what the experience is, based on safety profile, based on the physics, it's not even close call.

Steinbach: Okay. One statement-- and the second statement that I had questions about was, it said you don't need, for the breathers, you do not need enrichment of your fuel. You can use the spent fuel from others, and so you have, you don't have--

Kirsch: Well, you still need enriched fuel to get things started.

Steinbach: Okay.

Kirsch: It's like, you know, starting a fire. You need enriched stuff, but the stuff that can burn is the stuff that's the waste product of the other reactors. So fast reactors are able to utilize a much broader range of fuel sources than the traditional uranium reactor.

Steinbach: Right. And the argument was that that reduces the proliferation concerns, but--

Kirsch: Yeah. Because the material that is used in these reactors is basically impure. It, you know, doesn't need to be pure plutonium or any of that stuff, so it's, you know, and plus, it's too hot to handle. If somebody tried to break into the reactor to steal the radioactive material, they'd die. There's, you know, there's no good way to steal it.

Steinbach: Because the reactor actually enriches, so to speak.

Kirsch: Yeah. It makes the-- the material was too, it would be too hot to handle.

Steinbach: Okay. So--

Kirsch: You know, plus the waste product is not usable in a bomb. You know, the thing is that if it is usable then there are much easier ways to get it than from a fast reactor. Like, fast reactor's probably your last source. So, you know, I suppose you could say that there's risk in anything, but the risk here is really remote because you'd have to invent lots of science that's not yet invented in order to go and use that in a bomb. So there are much quicker paths if you're determined to do it, that you would go on. Be like, you know, but why would you go the long way around? Then it will take you, you know, 20 years longer, versus the shortcut approach.

Steinbach: Okay. Another plea on your page is that we should produce synfuel from the CO_2 dissolved in seawater, which requires lots of energy, of course, so it basically would require the--

Kirsch: Yeah. So you use nuclear-- you can use nuclear power--

Steinbach: --nuclear power.

Kirsch: --to do that, and so that's-- so people have been working on that, that problem, and it's just a-- it's an economics thing, so if we can get the cost down it's pretty interesting.

Steinbach: Hm. And there is enough CO_2 in the water to make it--

Kirsch: Plenty.

Steinbach: --feasible?

Kirsch: Oh, yeah. Oh, absolutely. Not a problem.

Steinbach: Because in the past, people used coal or something, right?

Kirsch: Yeah.

Steinbach: Or oil?

Kirsch: Yeah.

Steinbach: So--

Kirsch: No. I mean, the Navy's been working on this and the costs are actually not that far away than, you know, getting the fuel from traditional sources.

Steinbach: Hm. It wouldn't be gasoline. It would be probably a simpler carbohydrate like--

Kirsch: Yeah, yeah. So there's a Fisher-Tropsch reaction.

Steinbach: Okay. And yeah, the last question I have is: There's an entry in your homepage about this rare form of blood cancer that you have.

Kirsch: Yeah.

Steinbach: And the treatments that you tried, because there's apparently no approved treatment?

Kirsch: There is now. There's a Ibrutinib.

Steinbach: Oh, okay.

Kirsch: Which is approved for--

Steinbach: So that's an old entry?

Kirsch: Yeah, it was before the Ibrutinib got approved.

Steinbach: Okay. And did you spend your own money on bringing that treatment about? There was something about you were looking into it at least for finding--

Kirsch: Yeah, you know, and finding some researchers and I knew about the drug before it got on the market and offered to help them.

Steinbach: That would be with tests and clinical trials?

Kirsch: You know, whatever. Connecting them with people or, you know, helping on the clinical trials or what have you.

Steinbach: And but so there are companies actually working on this even though it's very rare.

Kirsch: Oh, yeah, yeah, because you-- it's easier to get drug approval on rare diseases, because otherwise if it wasn't that way then nobody would work on rare diseases.

Steinbach: Okay.

Kirsch: Right. So the cost of doing the clinical trials are much smaller, so it's actually, you know--

Steinbach: Oh. Because, yes, yeah.

Kirsch: --even though the market is smaller, the costs are smaller. Yeah.

Steinbach: Okay. That's interesting.

Kirsch: Yeah. Because otherwise orphan diseases would truly be orphan diseases.

Steinbach: Right.

END OF THE INTERVIEW

