

URL: <https://stvp.stanford.edu/blog/videos/nailing-the-hard-things-entire-talk>

Entrepreneur and venture capitalist Ben Horowitz shares which entrepreneurial skills truly matter, and why learning to manage well may be the most critical skill of all. Horowitz, a founding partner of Andreessen Horowitz, discusses the value of learning inside a large company, some of the exciting technology frontiers ahead, and the purpose and philosophy of his firm, in conversation with Stanford Engineering Professor Tom Byers.



Transcript

Let's start with college.. College.. You were - where did you grow up, Ben? Well, I grew up in the People's Republic of Berkeley.. Right across the way there.. Berkeley is not really about sports anyway.. It's more about communism and weed but - so Peet's Coffee.. What? Peet's Coffee, communism and weed, but how else did Berkeley influence your entrepreneurial bent, do you think? Berkeley, when you are a teenager, you tend to be rebellious and not want to do kind of what your parents do or what the establishment does and the establishment in Berkeley was hippies.. So that kind of caused me to want to be the opposite of a hippy and so I joined the football team and I was just oriented around like what was going in the world and wanting to be part of the society that I was definitely counseled to stay away from.. So it was good in that way although I have a great feeling for Berkeley now that I am no longer rebelling against it.. I see more value in some of the hippy culture and all these kinds of things..

But the rebellion has drove me from being a communist to being a venture capitalist.. Well, let's take the journey on that, that transformation.. You went to college at Columbia UCLA.. What did you study and what your memories of that? Computer science.. Yes well I studied computer science and in those days, when I got to Columbia computer science, a little bit of a frowned upon major, if you can believe it given what's going on today, in that there was a big debate in academia at that time that computer science wasn't really science, that electrical engineering that was like real.. And that computer -- software was just like the tools you used to program a computer like it wasn't like there was nothing to it and it was a thin layer and it didn't warrant its own major like maybe a class, but not a major.. And so everybody in the major was like what are these guys idiots? They ought to actually try to understand how a compiler works and so forth and then make that claim.. But that was kind of the beginning for me.. This is a funny sort of question perhaps but what do you wish you had learned or spent more time in and I have just been thinking about that myself.. I went to Berkeley and first time I've ever admitted it here..

But three times, but I was an undergraduate engineer and I avoided sociology and psychology classes, of course, now being an entrepreneurship professor over 20 years, that's exactly the roots of entrepreneurship.. So what are your regrets, if any, about what you studied? Well, it's funny because when I was in college, the thing that I thought I was doing that was a huge waste of time was I was completely obsessed with rap music.. And I would listen to it constantly and to the point where in those days there was actually no - there were no rap radio stations and there was no UMTV raps hadn't come out yet or any of that stuff.. And so there were only two rap shows and they were only on one day a week on Saturday night.. So I wouldn't never go out on Saturday night.. I would sit at home because I had to record them and then in those days, there wasn't like these fancy like record to disc, you had a tape, you would press record and then when it got to the end of the tape, you had to be there to flip it around and do it and then if you're smart, you would be there to pause on all the commercials so that you could get more life out of your tape.. So I missed like all that college life and I was like wow I probably wasted a lot of time.. But now, my whole career is based on my affiliation with rap music.. So it's what I'm known best for and so that turned out to be good.. I kind of wish I had studied more biology, I didn't - I was very interested in it and I did not realize at the time that kind of information science and biology would connect when they did or in the way they did..

I would sit a little neurology in graduate school as part of AI which was -- also seemed like a complete waste of time because AI didn't work for like 25 years but now it's working.. So you never know.. I guess I would say anything that you learn is a good use of your time probably.. Well, let's drill on that for a minute.. What skills can these students learn you think while in college in addition to perhaps technical - we are in the engineering school, so let's assume they are getting a great, great

dive into technical matters and science? But what about the rest of the skills that will serve them well no matter what they do? Yes.. So in the world of entrepreneurship, the big skills are kind of programming skills and people skills like those are the big two.. And I think people skills tend to be highly underestimated in terms of just ability to run a company and so forth.. And what I mean by people skills is the ability to understand other people's motivation and other people's motivations who you are talking to and then who you are also not talking to and how they are going to think about something and where they are coming from and relate to that in a way that gets you to the right conclusion about how you build an organization or build a company or make a deal or any of these kinds of things is incredibly valuable and that's what I would say most of the kind of good entrepreneurs end up lacking more than the technical skills that we see now like being like a boss level engineer like that's extremely valuable I'm not discounting that but that's really the other big, big skill that you can learn in school.. Yeah.. And we have seen that in engineering education curriculum, it's added a great deal of those kinds of skills and behaviors and techniques since we were in school..

The other thing I want to talk to you about when I think back is you came out of school and then the Internet came upon us as an opportunity and it's defined your professional career.. Yeah.. I was - I am a little ahead of you in life.... Yeah.. And so two years before that it was software, it was software on a personal computer and I got so lucky that - to be in software, you always thought it might - early days -- you thought you had to go work in a mini-computer or mainframe company which was really boring, programming those.. Yeah, yeah.. Yes.. So packaged software was just this big change I fell into with a lot of luck at Symantec and so on.. For you, how did you - were you brilliant to see that opportunity or was it just so obvious that it just drew you in and it's been your life? Probably.. Yeah, so in the beginning, because I ran into the Internet long before I kind of moved my career that way but in the early days, so when I kind of first interacted with the Internet, it was slightly after DNS was invented, for those of you guys I don't even know maybe like too low level plumbing..

But DNS is a system where you map the domain - the name of the computer to the IP address and like how that gets like that get host by address, get address by host, whatever.. But DHCP which is basically the protocol that gets you your IP address so like when you connect into whatever your Wi-Fi hotspot and so forth, then you like get the address like that had not been invented yet.. So the way you got on the Internet when I got started, is you would like call a guy, and you would say, can I have an IP address, you remember.. He would be like, okay, like here is a four octet number and you would go and you would edit your file at CHOST put in your four octet number and you would - there was depending on your version of UNIX, there would be some other file you had to edit.. And so like - and that was - and then it was all text based and there was - we had email on it at that point and like it was obvious that the plumbing was going to get standardized because there were these other kinds of rival plumbing systems like NetBIOS or NetBEUI or LanMan or SNA that were just like they were vendor specific, so it was like there was going to be one network.. But the Internet like the way we think of the Internet today was not at all obvious at that point.. But then when actually my partner, Mark, built Mosaic and I saw that for the first time and there wasn't that much on it.. There was like a guy who had - he was monitoring his coffeemaker to know when it ran out, so he could go get coffee and then there was some guy in London put his restaurant menu here in the Indian restaurant, they put that on the Internet and those were like the things that were up there.. But it was like oh, wow, like this is going to be everything because I had enough of a basis and understanding to go and I called my wife who is sitting here, Felicia, I was like get the kids we're moving to Netscape, that's it.. This is definitely the future, no question..

But I had a big - like if I had just seen Mosaic, it might not have been so obvious but I kind of had seen all the other stuff and I hadn't quite gotten there yet.. And you were working for a big company initially out of.... Well, Silicon Graphics, yeah.. Silicon Graphics.. So I want to talk - can we talk a little bit about that because I was talking to my undergraduate class this morning and a number of them are seniors and they are thinking about life after Stanford.... Yeah.. ...and it made me - in getting ready to chat with you I thought about what's happened in t this room the last month and many of these folks were there.. Matt Rogers from Nest went to Apple right out of I think CMU, I think I get that right.. Yeah.. Lou Cerny came out of Dartmouth and went right to Apple as well and you did Silicon Graphics..

But those are - is that just old school? I mean is that just old - bad pun but is that just last decade or a decade before or is there value now to work for an established company out of school? Yeah, there is definitely value.. So it's kind of the same value that there was when I did it.. So when you come out of school, you know some things and there is a whole lot that you don't know.. And there is kind of advantage and disadvantage in building a company at that point in your life.. But the big disadvantage is in that the things that you get from a big company are: one, you really have no idea how to run a company or manage a company and going to a big company.. That's where I learned how to manage and it wasn't so much that there were like great managers who managed me or something like that.. But the way you would learn how to run a big organization is to work in a big organization because it's the frustrations you have trying to get something done that basically become the basis for the design of the organization when you are on the other side because you're like, okay, if I was an engineer, and it was taking me an hour to like check something into the source code tree and then like 12 hours to build it.. That would be a nightmare.. So now, I am back running the company I know that that's going to be an issue or if like it took me a week to get a decision made like how frustrated would I be whereas like you talk to a CEO right out of Stanford who has never been through that and they have got guys sitting there like not being able to get a decision made and they are like what's the problem? That's like all the attrition nobody wants to work for you but it's harder to figure out like if you've never worked in a company like why that would be such a big problem to not be able to work for a week on anything because you are waiting for somebody to make a decision who doesn't think it's important enough to give it the time of day.. And so these are the kinds of things that you learn and there is like a million details around that which you just can't learn like you just - it is not intuitive - I

guarantee you nobody figures out how to do that on their own..

So - and that is the best way to learn it.. So that's the first thing.. And then the second thing is you have - you meet people who like people at Apple, like people at Facebook, people at Google like smart people and you kind of build a reputation so that if you go to build a company like those are people whose skills and - who you can draw upon and who you can hire and work with and build something really excellent.. And then the third thing is you kind of learn about the world and the basis of a good company is to basically figure out something about the world that nobody else knows.. And then that secret becomes the company.. And if you have not been in the world then your basis for the secret is you just have a more limited scope of what you might have learned.. Now, there are people who learn stuff in school that is a big enough secret like Mark Zuckerberg figured out Facebook while he was at Harvard, absolutely, if you have an idea that big, then by all means, go for it but if you don't, and you try and go build a company with zero management skill and no network, that's hard, bro.. It's going to be hard like - and you have to think like who would want to work for you, like unless it's like everybody smart will want to work for me because I have got the breakthrough idea of all time and it's running away like a freight train and it's growing like nothing else ever.. Then yeah, definitely start a company but if you don't have that, and you try and do it, and you're competing with like Tony Fadell who invented the iPod and is also starting a company for engineers like where would you work? Would you work for you? Would you work for Tony? And that's the kind of thing you have to figure out.. I have got so many questions I could ask you in different directions that we can go in..

How many of you heard about his book? Yeah, I mean it - so there has been a few really cool books come out this year, Peter Thiel's book came out, Walter Isaacson has done a really cool book about the history of Silicon Valley and so on and it's - look, The Hard Thing About Hard Things which is just - where did that title come from? Because that's - it's just a way cool title? The Hard Thing About Hard Things? Well, actually, I wrote that title myself which I understand is like actually pretty rare in the book business that they let you keep your own title.. But where it came from was when I was a CEO, it was an easy time, I slept like a baby, woke up every two hours and cried.. And.... You need a drum roll.. ...and when I would be up and this is not a joke, it's actually true, you can ask my wife.. I would be up at 3 o'clock in the morning, just sitting there and going why are none of the management books that I am reading helping me like they are no help at all.. And I read literally every management book.. And I realized that management books are generally written for like how - here's how you to not screw up your company.. But if you start a company, that lasts like a week and then you've screwed it up.. And then like where is the book for that? And that's what was missing..

So I would think about I'd be like okay, so all the VCs and everybody tells me, Ben, do you know what the key to a great company is.. Hire A players and I would be sitting there like, oh, great, because I was going to hire a bunch of fucking idiots.. And now you've unlocked that secret for me, thank you.. But that wasn't like - the hard thing is not to like hire the best people, right? Like the hard thing is when your company is going like this and the great - best people don't want to work for you and then like who do you hire and like how does that work and like do you hire the person who is okay across the board and hire a president that's got something like horribly wrong with him but like super great about them and how do you think about that and what do you do with the horribly wrong stuff once you get them.. That's the hard thing and I read the Jim Collins books which I hate.. But - some of you like him, I know, doesn't mean you're not smart if you like them because a lot of smart people like them.. But the thing that he does is he makes you feel good about yourself like but then when you get into it, you realize cause and effect is all like swung around and all these things but he's like big - what great company have is a big hairy audacious goal and that's great, but that's not hard like it's pretty easy to write a big hairy like we're going to go to moon, we're going to build the biggest company in the world, we're going to have software on every desktop, that's all going to be ours.. That's our goal.. Okay, so now you've missed your goal.. And not only did you miss your goal but you built up your whole company to achieve your goal and you have a cost structure that's designed to hit your goal and you missed your goal and you're running out of cash and the company is burning to the ground and all of the company - everybody who works for you thinks you are a moron because you missed your goal..

Okay, that's hard.. That's the hard thing like what do you do there? Well that's not in Jim's book, he didn't even talk about that.. And it's like nobody ever misses their goal, who is a great company.. So why would you miss your goal? That would be great.. Okay.. So anyway, that's where the hard thing about hard things come from.. Some of you are already entrepreneurs I can tell.. I just want you to translate the f word for our friends from Uruguay.. Oh yeah I'm sorry.. Does that translate...? Yeah, I have CEO Tourettes syndrome..

Oh, my goodness, that was a bit of a wartime CEO rant just then.. Yeah.. Talk about this peacetime versus wartime CEO in the context, I mean since we're on the book and it is a lot from your - you opened up and talked about what it was like to run the company.. Let's talk about that difference.. Yeah.. And it really is a difference in wartime and peacetime.. It's really a difference in the decision-making process and the reason that I kind of wrote that piece, Wartime CEO/Peacetime CEO is that if you read - in the management literature, it's almost entirely written for peacetime CEOs.. So like everything you learn about decision-making and delegation and don't micromanage and all these things are very peacetime oriented in the sense that in peacetime, you're much more focused on the development of the people and the development of the organization over the long-term and the ability for the organization outside of yourself to make higher quality decisions and then also kind of be creative outside of the mission and that's kind of all affordable if, like, you've got, say, like you've got Google search and you're just like running, steamrolling through the industry, then you can do a lot more peacetime sort of things.. On the other hand, right, if you're running out of cash or if you are like Apple when Steve Jobs first took over and they had three weeks of

cash left and so forth, like you can't actually like that's not affordable in the decision making process, you've got to get to a very accurate decision extremely quickly and that's when you kind of have like a - that's when the wartime techniques come into play.. Sometimes in wartime, you end up doing things that actually do undermine the development of the organization because there is more burden on the CEO to make a much larger number of decisions because accuracy is so important and the CEO by virtue of her position has got more knowledge to make those decisions and more authority too to make them definitive and fast and high quality..

So that is a lot about what that was about.. And I thought a lot of it came from Andy Grove has a great book called Only the Paranoid Survive which a lot of you probably have read here.. But there is a part of it where he talks about when he turned Intel from the memory business into the CPU business which is a like a real wartime story like it's like okay, like I walked into the room and I was like, okay, what would we do if we were - if I was fired tomorrow and then like somebody came in to replace me and then all of my whole staff was fired and replaced all of them, what would they do with the business.. And then like I walked out to the car like I had a cigarette, I looked out into distance, I was like alright, we've got to lay off 80% of the people.. And those kinds of things are - they are just not things that you kind of normally encounter in the business education but in the real business world, that's like most of it ends up being wartime particularly in startup world like a huge amount of it ends up being wartime.. So that's kind of the basic difference.. On a related post and I don't want to miss this opportunity especially for the students in the room and thinking in particular the undergrads to hear directly from you.. These leadership and entrepreneurial traits that we talk about in terms of starting a company, you were here a couple of weeks ago with Sam's course talking about how starting or startup or something is the name of the course.. So there is a lot of emphasis on starting the company, but the real hard stuff comes after some success.. And so the skills and the behaviors it takes to start a company, is that the same as it takes to scale it and grow it or which ones are similar, which aren't? Well, so like startup gets really hard when the product gets into market and those of you who have done it know this, right? When you're building the product, it's all good..

How is your startup? It's doing fantastic.. We're building a product that's going to be great, it's so genius like everybody I tell about it kisses me on the lips and says wonderful.. But then you get into market and nobody wants it like then it gets real hard real fast.. So that's like kind of the first psychological trauma.. But the initial skill is can you build a great product, can you build a product that a lot of people really want for whatever reason? And that is different than kind of building a great company and - but if you can't build a great product then it doesn't matter if you can build a great company because you don't belong in startup because if you can't build a great product, you never get to the great company and that was actually a big error in the 1990s and a lot of that lean startup methodology and so forth came out of the mistakes that were made in the 1990s where they'd bring in a professional CEO really early on who didn't know how to build a great product and would build the company to a giant size and burn up all the cash.. But the skills are different.. But like management skill is - management is a learned skills, it's not like -- nobody was born a great manager and I think that's one of the things people run into is you feel like, oh, well you know like that person over there just seems like such a natural manager, but it's not -- nobody is really that natural at it, it's an unnatural.... You learn what you know now in that job? Oh, yeah, it's a very unnatural job like so I'm having this conversation with you and if I stopped you and was like, Tom, the way you asked me that question like it was okay but like you didn't really have the right emphasis at the end and go back and practice and come back tomorrow and do it again.. Like if I said that to you, you would be like that guy's an asshole.. And so like anthropologically like you don't want to do that because if everybody doesn't like you, then they are going to feed you to the lion or whatever..

So like it's not natural but like as CEO, as a manager, that's what you have to do, you have to evaluate people's performance, you have to correct them, you have to make sure they are on task and those kinds of motions are - you have to learn how to do them and you have to learn how to do them in a way that everybody doesn't hate you all the time.. They are going to hate you some of the time.. But you just screwed up my night because now I'm going to go home and my perfectionist is going to take over and I'm going to say I really didn't ask that question correctly.. So I am going to lay awake at night.. Can we talk about a16z? Sure.. First of all, where - who came up with that for the first time? I mean Andreessen Horowitz, so was it you or.... Andreessen Horowitz or a16z.... Yeah, I know.. ...which one? Oh, a16z? So I came up with a16z.. That was mine..

That's me, baby.. And so - let's back up, why did you and Mark start a firm and what now, 2009, five years ago? Why did you start a VC firm? Yeah.. So it's really a simple idea which that kind of started on a thing that he got like really fired up about which is he is like, Ben, you know, it's so crazy that when we look at the companies that you and I really like, you look at like Amazon, Hewlett-Packard, Microsoft, Oracle, any kind of great technology company, Google and so forth, they are either like run by their founders, or their founders are like right at the top of their company like the founder is like essential to every long lasting tech company, IBM.. But the Silicon Valley way, the way a venture capital is to replace the technical founder with a professional CEO.. So like are we just like focused on building like mediocre companies, why is that? And so I was like that's kind of right having been a like technical founder CEO like that was like the very first meeting with my venture capital firm it was like when are you going to get a real CEO.. And so we thought there ought to be a firm that is designed for the technical founder to enable the technical founder to run basically her own company and that with the basic idea being it's - we came to the conclusion that it's easier to teach the innovator how to be a CEO than to teach a CEO how to be an innovator particularly in a domain that you've transplanted them into where they - it wasn't their invention, it was somebody else's like you're kind of trying to advance and that was kind of - that was basically the idea for the firm and we thought that was like startup type stuff you thought it was a good idea.. So you go ahead and try it.. And it did turn out, we refined the idea a lot.. We said okay, what do you need to be a CEO if you're just like an inventor and it's like well, first, it would be great to

have somebody on your board who has actually like started a company and been a CEO, and so our first thing was like, our motto was some experience required to go in your board which is very unusual like if you, most venture capitalists have not run companies or certainly not founded and run companies.. And then the next part was we felt like the network that was the really thing that like made the VCs' eyes pop out of their head, it's like oh, that guy's network, he knows all these customers, he knows all these executives, he can build the team like really fast and it's going to be awesome..

And so we thought, well, like, what if the firm like was that network like, what if we just built the firm into a giant network where we knew like every important customer and every great executive and every great engineer, what would that look like and that's why we have a hundred people at Andreessen Horowitz, and aid investing partners and like most other firms are kind of the opposite kinds of ratio and much fewer people because we wanted to build the professional CEO network for the inventor CEO.. Yeah it's fascinating I went on the web and I looked at your site and I suggest you do that as well, look at a16z site and looked under the people or about the team or what have you, and you will see these 100 employees and in different categories, some in marketing, some in business development, some in well board members, I forget the other categories, finance and operations.... Finance, technical talent, sure.. Yeah, across the board and then look at the sites of the other firms, it's quite remarkable.. So - and if I let's just also since we're a bit on metrics of the firm and then let's talk philosophy, the first fund was how much? \$300 million.. \$300 million.. So you raised it from other folks and then you go out to invest it and that was five years ago.. Now, how much total capital are you managing? \$4.7 billion.. Wait a minute.. That's a lot of scrilla, I got excited..

Was that in your mind when you started five years ago or did that happen organically? I mean was it, I won't say accidentally but did you imagine you would be managing almost \$5 billion? So like one of the things we knew from being entrepreneurs and this is a very, very key point in entrepreneurship is that it is just as much work and just as traumatic to build a company that's trivial and nobody cares about than it is to build like a really significant important thing.. It's the same amount of work, so you might as well try to do something important and so that was our - always our thought with the firm.. We were like we're going to like - our goal is to be the most important venture capital firm in the world like it's completely megalomaniacal and arrogant and idiotic.. But that's like if you don't have that attitude as an entrepreneur like you should not be an entrepreneur.. So yeah, we were always going to be the biggest, we were always going to be the best and that was the goal and there was no reason to exist if we weren't going to do that.. Now, did we expect to get there that fast? No, of course not, that would be ridiculous.. We thought it was going to take much, much longer.. But we always thought like if we can get there like a big thing in venture capital is size because, one, for an entrepreneur to know that you've got a firm who is not just going to give you \$500,000 for your seed round, but then when you need the next round has still got money like that's actually a big deal.. But then in our model, the other thing that was important is in order to build the network we needed to be like one of the bigger more important funds because building the network costs money.. And the bigger the fund, the more fees you have, the more money you have..

And so we could direct those fees, we didn't pay the general partners much money.. But we pay the - everybody else in the firm and so that was all part of the theory of that.... Well, I am trying to think of some questions that might not be asked too often of you - just the success in terms of headcount and funds size is remarkable.. What about the conventional VC firms that you admire there must have been a set.... Yeah, they are really good firms, yeah.. ...that you kept.... Yeah.. ...in other words the core principles that you brought forward because the brands you built in five years is just it's over the top in terms of impact and - but what - and you have been disruptive but what was the conventional pieces that you kept? Yeah, so we actually - a lot - we spend a lot of time with Andy Rachleff who was on my board and actually teaches here at Stanford often.. And he had a bunch of philosophies that were - that we adopted and we still to this day.. And he was at Benchmark in...yeah, Benchmark? Yeah, he was from Benchmark..

And one of them was just like - he had done various studies, but somewhere between like 90% and kind of 97% of the returns for like any given year of all the companies that get venture funded is concentrated into like 15 of them.. And Peter Thiel talks about that a lot in his book and so forth.. But that's a really, I would say, counterintuitive principle and very important.. And a lot of the design of the firm was around this that like if you can get into -- make investments in some significant percentage of those top 15 then you're going to be a good fund and if not, you're going to basically lose all your investors' money, that's the easy principle which is kind of why the - all the returns go to like five firms every year like if you study venture capital, there is - when we started, there were, I think, 800 venture capital firms.. There's a lot less now.. But all the returns went to not only like five firms every year but the same five firms for 30 years.. And the reason is or the reason was that the best entrepreneurs would only take money from the best venture capital firms and the best venture capital firms up until kind of I would say like up until really us, were mainly determined by their results.. So what companies had you funded in the past, so it was an awesome business model because it's self-perpetuating like as long as you're at the top, you are very likely to stay at the top.. We were able to kind of crack that open by doing something that was really unconventional at the time which is not unconventional at all anymore which was marketing.. So we were sort of the first venture capital firm to super aggressively market itself and we had - so we had a unique position and a very aggressive marketing idea and that sort of opened it up to, say, well, like they may have a much longer track record than us but we will tell you exactly, exactly how we think about building a company like everything from like how you hire, how you conduct a lay off, like how you think about capital raising, like everything we're going to lay it all out in great detail and up to that point, the industry was just super opaque like you didn't know it was all like the man behind the curtain which was actually a very good strategy for the people who are winning..

It was just a bad strategy for new firms but new firms tended to just adopt what the old firms were doing.. So that was the big breakthrough -- you couldn't break through that way now because everybody markets their venture capital firm but we got through them time.. So.... I'm going to open it up here in a couple of minutes for questions from the audience but I can't help it.. What are some companies that excite you now? We know of the big winners you've invested in, but it's always fun to think about the potential game-changers at least in your view? Yeah, everything is exciting.. We love them all the same.. We love all of our children.. So one company that's really exciting is a company called Databricks which is guys out of Berkeley and they invented this technology called Spark and - so those of us who kind of like are in the industry, there has been this thing called MapReduce and Hadoop which some of you are probably familiar with and the thing about - and Hadoop has got like crazy momentum in the world in the market and so forth but anybody who has gone in and tried to program MapReduce or dealt with it knows the technology is a little left up in multiple ways.. One, it's just like hard to deal with, it's hard to program, it's hard to use but it's also has technological assumptions that are already starting to get out of date.. For example like the big - one big assumption in MapReduce is like things are on discs and network speeds are slow so that you've got to farm out the work to a lot of nodes have it computed and then like sent back up..

But you don't want to be doing computations across the network because that's going to kill you.. So that is kind of fading and these guys have come up with basically a much better programming model and a much faster kind of solution than MapReduce and it's got great momentum and they are geniuses and I think it's going to kind of take over big data.. So I am like really fired up about that one.. I know their company - so here - that's a funny story of how venture capital works.. So there is a company that we invested in called Teespring and inside the company.. So Teespring on the surface basically makes t-shirts.. It's much more than that but like it's this is the thing about venture capital like we invest in things that look like bad ideas but are really good ideas and this one really did look like a bad idea when we first saw it.. It's like t-shirts like how big can that be? But what it really is a platform for converting your social capital into your actual money and it works like unbelievably and in the conversation about whether we should invest or not, like most people were saying like we cannot invest in this, it's t-shirts like you are out of your mind like what are you doing? And it wasn't even me who was the one who was out of his mind.. It was somebody else, another partner.. And then one of our partners said, well, this is one that doesn't work in theory, it only works in practice and has continued to work in practice amazingly well..

So those are.... Well thanks for sharing that so let's open it up to questions.. We've got a few minutes here.. How about right here on the aisle? Hi.. Thanks for being here, Ben.. I wanted to ask you, you mentioned - wishing you had taken more courses in biology and the intersection between biology and information science.. And I am wondering specifically related to Jawbone how do you see that space converging and what do you think Jawbone needs to do to really differentiate themselves from their competitors in that industry? Yeah.. Jawbone actually a whole other dimension on it too.. So Jawbone makes devices that monitor your health from sleep to steps to heart rate and so forth.. And a lot of it is - so part of it is how do you collect the data in a way that's not like obnoxious, where it looks cool and it's fun to wear and those kinds of things..

But then the other thing is what kind of insights do you get from it and I think they are doing actually quite a good job of building a data platform for -- not only a data platform but a team of people who are really deriving insights from across the population like what's the normal amount of sleep that people get and I think they have already conducted the largest sleep study of all time and things like that.. But these kinds of things that like okay, people like - and then you start to segment that like okay, people my age from - with my genetics, what kind of sleep do they get and then am I below or under on that so I think the next thing is to get like the 23andMe data into the Jawbone platform and you start to put that together and you really start to understand where you are in terms of your actual health against where it should be with people who are kind of like you and what you should be eating and all that kind of thing.. Let me just check in back of the room.. Let me see, I am looking for some - way at the back next to the camera.. Let's say that you are the technical founder and you're simultaneously trying to juggle between that, building - being the product lead and also being the chief evangelist; as the company grows, obviously all three of those factors are going to pull on you.. Which of those would you say is first to be delegated away and how would you think about that decision? Can you repeat the question just in case.. Yeah, so it's okay, what if you are the technical founder, you're the head engineer, the chief evangelist, the number one designer and like you can't do them all indefinitely so which one do you delegate first.. So I don't actually think that's probably - it's probably less of a functional question and more of a like when you find somebody that you trust that can replace you in those things because you only get leverage and this is something that is really tricky for founding CEOs to get to but you only get leverage if the person that you hire can do it better than you can because as long as you feel like you're better than them at it, then there's - you're just going to keep second guessing them and you're not going to get any leverage and a lot of times like I will be talking to CEOs and they will have an executive and they will be like this person is really good and they are working really hard and I am like, well, you're always like frustrated about like you always feel like you have to do that yourself.. And it's like yeah, because they don't understand how to do this and that and I am like well, then like they are not an executive because the whole point of an executive is to get you leverage.. And so on the question like that is like where can you find the right person and make the hire to get you leverage..

And wherever that is, that's what you should give up first.. And you want leverage in all spots because as CEO, you can be the keeper of the vision, the quality control over the top, but you can't be the lead engineer forever like that.. There is no - and it doesn't matter how good an engineer like Larry Page, as great an engineer as he was, is not an engineer at Google.. He just isn't and he cannot work on production products.. It's a full-time job even for like somebody who can do as many things as Larry, he cannot do that and nobody can.. Like if Larry can't do it, you can't do it either, I guarantee you.. And so you're going

to have to give them all up.. And so it's just a matter of like where do you get the leverage.. Thanks.. How about right here?
Hi..

So you mentioned that you were interested in bitcoin and you guys are an investor in Coinbase.. As an asset or money that has fluctuated so crazily in value over the last couple of years.... Yeah.. ...what really makes you so enthusiastic about cryptocurrency in general? Yeah, so that's a great question.. So the question is so like you're investors in bitcoin, you're investors in Coinbase, but it's gone up and it's gone down and it's gone way up and way down and like in panic, he didn't say all that, but that's kind of in the - why do you have any confidence in like crypto-currency, why is it going to be a thing, it's fake money like you're an idiot.. He didn't say that, he wasn't meaning that he was actually prompting me to say something good about bitcoin to shut all of you naysayers up.. So the thing about bitcoin - so let me break down what cryptocurrency is and why it's important.. The first thing to understand is it's a legit computer science breakthrough.. So it solves a problem that was first specified, I think, in 1983 called the Byzantine Generals' Problem and without going into the exact Byzantine Generals' Problem which is interesting and complicated, think of it like kind of like the dining philosophers, problem for those of you who take computer science but the big thing that it solved was like the ability to transfer a piece - transfer not copy, a piece of digital property from one person to another or one machine to another.. And in order to do that, you have to basically solve the double spending problems..

So a naive version of a kind of electronic money would be you just make up a big set of serial numbers and then you give them out.. And so then I give you \$1 but the problem with that is you don't know that I didn't give that exact same \$1 with that exact same serial number at the same time to Felicia, like you have no idea that I didn't do that.. And that's a hard problem to solve the double spending problem.. So bitcoin, the original bitcoin paper and the block chain kind of technology solves the double spending problem and will let you transfer a piece of digital property from one person to another.. So what does this mean? It means that kind of for the first time and in a way that's been solved through history is like with Visa or something where they run a ledger that keeps track of all the money that is kind of transferred from one person to another.. But the problem with Visa is several fold.. One is that it's a proprietary system and it's a reversible system, so there is a large fee associated with it.. With bitcoin that solved, there is no person in the middle.. So it's the first time that there is a ledger that everybody can use that nobody owns.. And the reason that's important is if you think about what was really powerful in my youth about the Internet was it was a network that everybody could use but nobody owned..

And what that ends up meaning - or what it end up meaning on the Internet and why everybody - the reason that everybody underestimated the Internet is when they first saw it, it was like it's got no functionality, you've got to plug a yellow cable into the back, and you have got to call the guy and he's got to send you a four octet number and you've got a - and by the way, there is no security at all built into TCP/IP and it will never be secured and blah, blah, blah, blah, blah.. But it was a network that nobody owned.. So even though like the IBM networks, the AT&T's network, and Deutsche Telekom's network were like radically more functional.. Every new entrepreneur developed on the Internet because whatever they built, they got all the value for it because nobody owned the network.. And so the Internet over time became way more functional than any of those guys' networks.. And in the same way, we have a very strong belief in the firm that the ledger that nobody owns is going to be the thing that draws all of the developers and the best payment functionality, wire transfer, foreign currency exchange, and all kinds of other functionality that you can't even imagine now just like when people thought of the Internet as like oh, it's the electronic post office or whatever, well, it's not just a post office, right, that metaphor is too weak, money is too weak a metaphor for bitcoin but we think that having financial services platform that nobody owns that everybody can benefit for - from is going to be a very, very big thing as time goes on and I can give you a million, zillion examples of the kinds of things that might be built if something like that existed.. So yes, it's going to fluctuate up and down.. Yes, we're in the very early days of it but if I was - there are two things like if I was at Stanford, the two things I would probably be working on would be the crypto-currency or biohacking because that seems to be the two most exciting areas that will develop in huge ways over the next 20, 30 years.. Oh that was good wasn't it - that was good.. It reminds me - I just had a flashback so, Mark, your partner, came when we first did this series in the 1990s, I think you and Mark had just started LoudCloud, so we were in a building that doesn't even exist anymore..

Oh wow, the bad old days.. ...now is a pond or it's not even a pond because there is no water.. But then he came back last decade when we were in another building called Skilling and was super excited about what you were up to at the time and then to have you here now in 2014.. So we'll have to have you both back at some time, that would be something else.. I don't think we've done much together over all the years.. So that would be exciting.. Would you like to see both of them together some time? We would love to be.. Let's close the deal, it's called public commitment.. Alright, we've got time a couple more.. Let's get a couple more right here..

Thanks, again, Ben, for coming.. A lot of students travel into San Francisco Bay Area for school, for work, for studying opportunities and it's really an epicenter for technology.. But we're starting to see like Boris Wertz up in Vancouver or other VCs kind of spreading out.. Do you see that changing or is San Francisco the place to be? Can you repeat the question? Yeah.. So the question is a lot of people come to San Francisco now to build companies but there are kind of many centers popping up all over and Boris Wertz a great VC in Vancouver and then there is Fred Wilson and the Union Square guys in New York and so forth.. So do I see kind of Silicon Valley's importance changing over time? So I guess my observation is that people have been saying that for a while and Silicon Valley seems to keep getting more and more important like its importance seems to have been increasing over the last 10 years when all this kind of activity started and not decreasing.. And the reason

really is the network effect.. So if you're the n+1 engineer, I was just talking to some very excited entrepreneurs before the talk, where are you going to go? Like if you want to be the best in the world, where - are you going to go to Vancouver, are you going to go to Austin, are you going to go to Silicon Valley and most people go to Silicon Valley when they ask themselves that question.. And so as a result, Silicon Valley is still by far the easiest place to build a really important technology company.. And it's - a technology company is not a standalone thing, right, like you have to understand everything that's going on in Android and iOS and with BitCoin and what's going on in cloud computing and so forth to be competitive, it's an ecosystem thing and there is certainly nowhere in the world where the ecosystem like you have this kind of ecosystem awareness and then as you go to build the company, where are the people who have built companies that are somewhat like it in the past..

Well, like most of them are here.. So like the ability to accelerate the trajectory of your company by bringing talent.. So not that other people - other places won't do it, but it is a very strong network effect and the way I say it, look, you can build - you can make a movie outside of Hollywood.. You can make one in South Dakota but you're not going to get the best director, you're not going to get the best actresses, you're not going to get the best key grip because they are all in Hollywood.. And it's a lot easier to make a movie than it is to build a technology company.. So you just have to kind of consider these things as you think about it.. Now, it's not to say that no, like I was on the board of Skype which is built in Estonia and there are some amazing engineers in Estonia and they have built - and more good companies will come out of Estonia, mark my words, but where is like the repeatable like \$10 billion market cap like mega companies like most of them, I think, will continue to come out of Silicon Valley.. And you look at what's going in China, it's quite amazing as well.. So I am not saying this is the only place that you can build things, but I don't think it's going to lose its importance.. I know there is a lot more questions, but we're winding down..

What question did I forget to ask or we didn't get to ask you? You can ask yourself that question.. Sometimes I asked myself.... We tried, we're flipping this right now.. What did we forget to ask? Did we cover it all? Yeah.. I think we covered most of it.. What does it take to be married for 25 years, maybe you come up here and answer that.. Let's thank Felicia and Ben for being here.. Thank you...