



Stanford eCorner

Tackle Projects Others Don't Want [Entire Talk]

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Nest Co-Founder Matt Rogers explains why careers can be made on taking on the challenges and projects unloved by others. Rogers discusses what he learned working at Apple on the original iPod and iPhone, the importance of not chasing the money when raising capital, and how he and Nest Co-Founder Tony Fadell went about building an innovative consumer electronics company.



Transcript

How is it going? Solid, excellent, so grad students, I saw undergrads, how many undergrads? Most. Excellent. So I was in your shoes not that long ago by the way. So I graduated undergrad in '04. So 10 years. A lot can happen in 10 years by the way. Actually, in fact, your entire career could happen in 10 years if kind of the stars align in the right way and I think I'll talk about a few of those things. So let's get started. So one, I am Matt. I'm a software engineer by training.

I went to Carnegie Mellon not Stanford, by the way. Didn't get into the Stanford. They still ask for you to donate though, even if you don't graduate from Stanford by the way. It's a funny thing. That said, it's great to be here and I will tell you a little bit about myself kind of how I got here, a little about Nest and kind of what's gotten real hard as we've grown and a little bit of kind what's coming ahead, a little bit about the future. So to get started, so I've always been involved in technology, I always love technology. And I think something that special with our generation - I'll say that our generation, even though I'm about a decade older than you guys, is that we grew up with technology. I think this is different. This is actually a fundamental change. If you look at kind of the generation before us that was born like in the 70s and our generation, this is a fundamental change.

Like we grew up with technology, we went to school; there were computers in the classroom or computers in the library. You guys have smart phones and laptops. We didn't have those when I was growing up. But that said, growing up with technology at a young age changes your mindset as to how you interact with the world. And I think that some of the fundamental shifts that we are seeing and it actually enables a lot of the companies you're seeing created today. So I'll touch on a little bit of that more. So growing up with technology, I had my first computer at like age three, a Mac Plus, one of these beige Macintoshes that you see kind of in the old photos in the museums these days, but I actually grew up with one of those and I loved it. Even at a really, really young age, age five, I wanted to work at Apple. It was kind of my dream job, what I've always wanted to do my entire career. And I had that in mind, actually, as I went to school as I kind of learned even as a kind of teenager, I volunteered in the kind of in the technology classes, in the computer club and helped them set their networks and all those kind of things and loved it.

Very different way of growing up than many of my classmates as you can imagine. Many of them were like tennis stars and those kind of things, but I really loved computers and that's what I really wanted to go do. But then in high school I had this opportunity to start a robotics club. How many guys know about FIRST Robotics? How many guys did FIRST Robotics when you were in high school? Very, very few, so that's interesting. So first, started by Dean Kamen who invented the Segway, lots of medical technology, multi-hundred gazillionaire, and actually a revolutionary kind of guy and a really big thinker. When he started, back when I was in high school, it was a program to get young students involved in science and technology. So this program called FIRST, is kind of like a football for high school students, but more in the technology space. So they design like these big competitions with stadiums and have celebrities come to get people excited about technology. And my school was -

we were in a small town, with a university and we're like I think we can probably start one of these; we'll need some help from the university. We don't have a lot of money, but maybe we can get something started and myself, my teacher, a professor at University of Florida, got together and we started this thing and it was a ton of fun.

We built robots. We built, basically we built a robot that could pick up balls and kind of dunk them in a basket, which was really a big deal for like a bunch of 16 year olds. And it got me really excited. I was like I can build this robot, like may I do this as a whole career? And that got me -- got me down the path towards Carnegie Mellon entering the robotics program there. And that was an amazing experience, fundamentally changed my perspective on building technology. You could build technology that isn't just kind of in the virtual world, but also in the physical world. So one of the things that I did at CMU and I think a lot of you guys do here at Stanford, is you kind of mix disciplines. It's very cross disciplinary. So you work on software, there is hardware behind that, there is physical, there is mechanical engineering that goes behind that. For many folks there's biochemical -- there is medical engineering, all these kind of technology domains kind of mixed together.

So that was my first kind of encounter with that. But what also I realized and with the advice of a really close professor Yoky Matsuoka, who was my advisor at CMU was that academia is probably not the right way for me to go. I did the summer with her; working on a robotic hand that was controlled by the brain, it was a really kind of cool project for an undergrad and something that was way over my head but what I realized, that this was like a 10 year kind of project. And for me to stick around in her lab for 10 years is probably going to make me go insane. I had a lot of energy. I still have lot of energy it turns out. And she is like Matt, I think for next summer you should intern at a big company and learn about building products. So I applied at a bunch of companies and Apple called me first and I was like holy shit! How awesome is this? Like the company I've always want to work for as a kid, where I have like the pictures of myself as a 12-year old like smiling in front of infinite loop, and like I can go intern at Apple, this is amazing. They called me back; I was like I have to be there. And they're like, we don't want you to work on the Mac, we're starting this other team called the iPod team, they're doing music players.

I was like great, that sounds great. I didn't really know what the iPod was or why it was important, but it sounded great. So I got there and they didn't tell me what I was working on or what I was going to do, but I sat here, I got to my desk and they stuck me next to the printer cube. So like there is the big laser printer that the whole office would use and like my computer was kind of shoved in there and I was like the intern. It's like kind of the classic intern job where like people would walk by and they'd get their stuff off the printer and say oh, hey I'm Steve, what you do? I'm Matt, I'm the intern. And that was kind of -- that was how I started my career at Apple. And on my second day, a guy walked by and says I'm Tony. I'm like, hey I'm Matt the intern. I said, so what do you here? He was like, oh I built the iPod. I'm like oh, you're a really good guy to know.

And that's how I met my co-founder now at Nest, Tony Fadell. My second day as an intern and I completely embarrassed myself not knowing who he was. How would I know? I was the intern, right? That was a really fun summer though. Not in the fun sense where like we had a lot of beer. Although some interns did that I actually didn't get a chance to do that. My internship centered around reinventing how they built the iPod. So iPod was a really small team within Apple. It was kind of a start-up within Apple, it was an experiment. And when you do kind of start-ups, there are sometimes corners you cut to get things going, technical debt you may accumulate. You guys may be familiar with something like that, concept of this.

And the manufacturing for the iPod was never something that the team fully owned. It was something they outsourced and, they said this is probably something that we should own. Like we're building millions of these a year, we probably should know how we build them. So that was my job as an intern, is figure out how we build the iPods and how we can do it better, how we can test them better and then rewrite all the software we use to manufacture them. It's a pretty easy task right? That's not a really big deal. That's something that you definitely give an intern. Like responsible for probably 25% of the company revenue at the time, why not? So that was my job. And part of how I've always approached problems is even as a kid my mom would say like, Matt, we need to go dig a ditch. Great, let's go dig a ditch. By the way, that's good career advice, like in general, like when someone gives you a really hard problem, just like get excited about it and figure out how to solve it.

Some people tend to spin. That doesn't always work. So really excited to kind of reinvent how to manufacture iPods and I did a lot of all-nighters as it turns out and to the point where there was one day when Tony had to call my boss and said, can you make sure the intern goes to sleep tonight, because he has got a big day tomorrow. There was a time kind of around August just before I was ready to go back to school and they said I think it's time to kind of roll this forward and they were getting ready to launch the iPod Mini for that holiday season. So my stuff was going to go live and they were kind of switch the manufacturing line over and hope this would all work and I had tested it all ahead of time, it was going to be fine, right? Turns out it didn't all work and nothing ever works the first time, but after a series of all-nighters we actually got things running and I worked with the team in China, we got things up and running. So I had proved myself as an intern, which is an opportunity that many of you guys probably have. Hey, how many of you guys intern over the summer at company start-ups around the area? So for those of you who didn't raise your hand, please do it. It is the most valuable experience you could find. For the Mayfield fellows in the back, like I'm sure you guys got a great experience last summer or not this summer that's coming. We had a bunch of Mayfield fellows at Nest last year, it was great.

But internships super important you learn a ton, you'll get a feeling for what it's like to have like basically life in the real world and that's not just in the cliché sense, but also like to get a feel of working within a company, really important. It turns out working on hard problems at school and building projects at school to a deadline for our quarter or semester is very different than when the company depends on your success. Part of the conversation I had had with my manager at the time was like if I had failed, we may not have iPods for Christmas, and shareholders are really unhappy when that happens. It's kind of the - detrimental and when you -- if you're interested in entrepreneurship and you start companies the same kind of thing happens like if you fail, the company may go under and these kinds of things have consequences. So that was my internship at Apple. Obviously, they invited me back and I was thrilled to come back. So I went back to Apple in '05 as I finished my Masters and started out as a software engineer in the iPod team, basically, on the tail end of that first iPod Nano. And being the new guy in the team who had built some credibility, but was still pretty much the new guy, they said, let's give him the kind of the least important project and something that may not ever ship, but we need someone to work on it because we've got to have a resource on this project. And that was this new prototype project called the iPhone. If it's funny like you guys laugh, at the time we laughed too.

We were like who cares about this phone thing. We make iPods here, like we're never going to sell any phones. Seriously, I'm not joking. So we started this very, very Skunkworks kind of thing out in Apple, very, very small team, it was like a hardware guy, antenna designer, myself and a program manager, really, really small team to start the first iPhone. And that first prototype did not really work. It was kind of a disaster. But we learned a lot along the way and 18 months later kind of after hundreds of people's efforts, out popped the first iPhone, which was a completely different story for a completely different time and many books have been written about that year. But it was nonetheless a very exciting year, which we learned a lot. And I think for me, the most important thing I learned was how to lead programs. So when you're the first guy working on something, what happens next is like the second guy has questions on like the stuff the first guy worked on and hopefully the first guy is able to articulate what he did.

And if you can imagine that cycle perpetuating when you have guy 100 joining a project, it's good to have a fountain of knowledge. So that's kind of the kind of culture we built at the time and the reputation I developed was that if you had a question, had a problem like talk to Matt he probably built it, and ask him how it went. And that's kind of my informal introduction to leadership. That's how I kind of learned. It was never something I thought I'd get into; I'm a really introverted guy. Super, super quiet, like I don't speak in public. Albeit, speaking in public right now. But as you can imagine one of the things that you learn is that the kind of building these connections with your fellow co-workers and project mates is that like you start to build a team and it's like building Robotics back in high school or playing soccer and you're on the team, you're working with each other and if someone misses a shot, you try to help them out. So that's what we did and I learned how to lead teams through that and learned how to communicate and how to build project plans and kind of learned how to do the end to end. And throughout the kind of the rest of my career at Apple, I was kind of the guy they gave new stuff to go build teams.

So when we started kind of taking over and doing a new Shuffle, like Matt can you start the new Shuffle program, no problem I'll go do that. By the way, no one else wanted to do Shuffle, it was one of those kind of like hobby projects that no one else wanted to do, but it turned to be a really big success for Apple too. So again like building your career on things that many people think are not important, but sometimes are worth taking a bet on. There is a couple other things like that too like manufacturing, like manufacturing is not like the glory work of Apple as you can imagine. Like the UI work and the industrial design is kind of the big sexy stuff, but it turns out manufacturing is really important. And you can learn how things are made that way and build a whole career out of it, which I kind of did actually. So that was my career at Apple. It was really exciting. It was basically my dream job, something I've always want to do my entire life. But then I left and this was one of those kind of moments when like my family would call me, my grandpa would say like, are you crazy? You're making how much money with a really stable job, with the biggest company in the world? And you want to leave? And you want to not make any money? How are you going to do this? I'm like I have some money saved up, it's going to be okay.

Tony and I have a really cool idea that we're going to go push. And we did that actually and it's funny that the same people who were very much naysayers then are now like my biggest advocates, it's funny how that works. These kind of things are - families are complicated, I will put it that way. Family is a completely different - there's a different course for family dynamics. Psychology school, that's down the hall, I'm not going to cover that one. So starting Nest, it was a very interesting discussion which got us started with Nest. I'd always been interested in the home. I had bought this house back at Apple. It was like a 1970s house and it was like literally the epitome of the 70s, like beige appliances, like LED displays with dials on them, like the -- you know wood paneled wall, like literally house of the 70s. And I was on the toilet with an iPhone.

It didn't really make any sense, like these things didn't work all around me. My whole world had changed like I assume yours -- like how many guys use iPhones, android phones everyday? I'm assuming 100% of hands are up right now. That's my point, like our lives have changed, yet our homes are essentially exactly the same as they were in the 1970s and that's fucked up by the way. It doesn't make any sense. It makes literally no sense and that was the opportunity we saw. But you can't build a company with a kind of a - you can have a grand vision, but that's completely impractical. Like, if you ever pitch an investor

saying we have a really grand vision, we're going to reinvent the home, we'll tell you later how we are going to do it. They'll probably laugh at you, because that's not how you build companies. It's good to have a grand vision and this huge road map of things you want to do, but it's good to start with a thing - something really, really concrete, discrete and that alone could be a business. So that's what we pitched.

We pitched the idea of let's go build a company based on thermostats. And many people laughed us then too, actually it was really funny. I built -- actually I think I built my entire career -- actually probably my entire life's work on things that no one cares about. And I've actually done really well doing it, which goes to show you that things that don't people - people don't care about, actually are really important. That's what we found out. So Tony and I back in the day, where back in the day is like 2009. Holy cow, it's actually not that long ago. We are doing some research in the home and basically figuring out what can we do. He had building a home, I had a home, we looked at all these products and it turns out that heating and cooling are half of a home's energy and yet everyone knows what products exist there, right. They do now that we've kind of brought this to people's attention.

But back when we started the company, like no one was aware of how much energy was going into their heating and cooling. It's like kind of \$1,000 per household per year. That's kind of mass scale. If you think about large problems, things that should keep governments up at night, home HVAC is probably not one of them, but should actually. It's like it's -- that's more than all the solar plants in the U.S probably the worldwide combined. It's more than all the nuclear power plants in the U.S produce. It's kind of that level scale. But yes -- no one really paying attention to it. But we realized that we could build a company just doing that and given that company, we could then build a platform to do more. That was the whole premise.

It was actually really simple, and that's what we went to go do. So the two of us got started really early 2010 and started calling our buddies, like the people we had built relationships with back in all those teams in previous years. For me, that was the guys I built the iPod with, the guys I built the iPhone work -- with. That professor who convinced me not to go to academia, she joined the team. Be friends with your professors, they may come in handy later. Tony called his buddies, so guys he had worked with at General Magic kind of the iPhone of 20 years ago that no one has ever heard of but was actually a really kind of great hub of technology. And we got this team together of some really, really smart, motivated folks who actually took no salary, like they believed in us. They believed that we could build a company doing thermostats. And that's what we did. And we spent a better part of 18 months building a thermostat and when Jose who runs our recruiting team and I would go out and meet candidates or - at this point all the candidates were people we knew.

We were like we want you to quit your job running the iPhone team to go build a thermostat with us and most of them were like you're crazy. But some of them did not think we were crazy like, I can see this. Energy-savings, hundreds of millions of homes, this could be a big business opportunity. And a lot of people joined. So that first year we hired about 70 people. And that's a lot for a start-up. It turns out doing kind of the end-to-end in technology is really complicated. So we realized that in order to do this well, we had to do the end-to-end. This is something we learned at Apple. Apple does this really well.

They have the iPod, they have iTunes, and they have this Music Store. And then when the three work together, it creates an ecosystem, locks people in. At the same time, creates a great user experience. It's kind of the best of both worlds; users win, company wins. It's kind of the best way. Did the same thing with the iPhone. iPhone, App Store, App ecosystem. It's freaking great. How many of you guys have iPhones? Case in point, it works. So, given that premise, we wanted to apply the same thing to the home.

So let's go build a great thermostat, let's build great software for it and let's build apps and services that go along with it. And it turns out -- that's a really big thing for a small company to take on. I mean like we thought that would have been pretty easy. Like Tony and I actually estimated that it was about six or seven people, six months and we'd probably get this thing launched. And it turns out we were off by a about an order of magnitude. And fortunately we had some great investors, some really fantastic folks. Randy Komisar and Kleiner Perkins helped us basically get this thing off the ground and it's really nice to have investors who believe in you. I think -- actually how many of you guys plan on starting a company, raising money sometime in the next year or two? Okay. So a few of you guys. So my advice to you guys is don't chase the money.

The money is not important. When you think about raising money, like how much you raise is actually not important, you will get term sheets. That will happen. Well at least in this economy it will happen. What's more important is who you work with. And we were really fortunate that we worked with a partner who believed in us, who would work with us, and honestly would do anything to support us. So as we realized oh, shit we got the plan wrong by an order of magnitude, we're going to need to raise some more money, he was there to help us. He helped to kind of evangelize us around the VC community to kind of get more folks involved. As we realized, holy cow, this may take a little more time than we thought right there behind us. And as we needed to scale to go from 30 people to 70 people to 300 people, we had a partner who was there with us, it was really nice.

I wish that all companies had kind of partners and Board members like that. Not every company does. It was really tough though. As it turns out, every entrepreneur will probably tell you that it's hard. And I think -- in fact, in this series, I think Ben

Horowitz is the last speaker, I think his whole shtick is like the hard things about hard things, it turns out they are hard. It's obvious, but there is no real way for me even to verbalize how difficult it is. As an entrepreneur you are really on your own. Like, yes you may have a VC partner, but in the end he is an investor, he is going to try make a return. Fortunately Randy was not one of those kind of guys, but in fact most entrepreneurs have VCs who are out to make a return. I had one co-founder.

The two of us were literally on our own. Fortunately, we were really close, like we call each other every morning, we still do. Like every morning at 8.30 we get on the phone with each other on the way to work and we talk about the things that are happening in our day. At the end of the day, we usually call each other on the way home and how'd the day go and what kind of things do we need to work on next. But really, like you're very much alone. Your early employees, your team, they're with you, but being an entrepreneur is a very lonely place and you'll - you may hear this from other entrepreneurs, it's very difficult. Like things will go wrong. In fact, everything went wrong for us and to the outside world it looks awesome. We've done a great job getting this Company launched, building momentum with our marketing, with our sales, with our product. But in fact everything went wrong.

Our initial plan was completely wrong. We had to rework that. Our launch plan, we were going to launch in Best Buy retail. That was our play. Like build the products, put it online, put it in Best Buy retail, it's going to be great. Best Buy backed out at the last minute, we had no retail. Fantastic, it was going to be great. But we work through it. It turns out when you have an attitude, like when things go wrong, you're just like let's just figure out how to get -- how to make it right. And if you have a team culture where when problems happen, people don't freak out and just figure how to plough through it.

Things tend to go in your favor. So I think in terms of big lessons, like things that I've learned is that surround yourself with a team that augments your weaknesses, so that when things go wrong you have kind of your trusted counsel of folks who have all these different perspectives, who can figure out solutions. It actually - and it actually worked. So, to the point where when we lost that Best Buy relationship in the early days, by the way, Best Buy is one of our strongest channels today. They turned out, they learned. We were like we got to come up with a different strategy. So let's put it online and see how we do, turns out we sold out, that was great. The marketing worked. Turns out PR, also very valuable. People will tell you like, PR is the best means of early marketing and it's 100% true.

It's essentially free. And if you have something that's really cool and newsworthy, people will write about it. And when people write about it, other people will talk about it. Really great, really cool. So that got us kind of out the gate and we realized very quickly is we still needed broader retail. Like we need a bigger presence. How are people going to learn about Nest products? So we call a bunch of different retailers to kind of get us a sense of who would be interested in carrying this product? Like most folks don't carry thermostats in retail. The kind of folks who carry thermostats are like Home Depot and Lowes. Well, we could sell there, why not? Turns out, they don't really sell consumer electronics, but if we could teach them that part, then maybe we could build a big business there. So we called both and Lowes was kind of knocked off their chair.

They loved us. And they - we started with Lowes in a few hundred doors to kind of see how things went and they went amazing. They went really well. We were selling several per store per week, which is a huge metric by the way. Like people talk about growth metrics for companies these days and millions of users or tens of millions of daily actives, it turns out when you sell physical goods a couple per store per week is actually a really big deal when you start to multiply it. And when we saw these growth numbers we were like, we may have something here. So we started calling other partners like and we actually built a story about this. At the same time, behind the scenes, myself, my team, working on the next thing. Other lesson learned at Apple. Always be working on the next thing, because chances are your competitors are going to be copying your first thing.

It's still true by the way. It's still true. Even today, you see like Apple announces iPhone 5, all the competitors try to copy iPhone 5. Apple iPhones - announces iPhone 6, all the competitors try to copy iPhone 6. Good thing, they're kind of always looking one step ahead. It's usually a good strategy. So we were already one step ahead, thinking about kind of our next product and we announced our Nest Protect, a smoke alarm. Kind of another kind of unloved product that no one cares about, but in fact helps save lives. Really important. And we realized that we can actually start building this into a much greater vision.

A greater - a vision we call the conscious home. The idea that instead of, you hear about smarthome, that's kind of a really geeky kind of thing. Like, I may want a smart home, but I'm not the general populace. My mom doesn't want a smarthome, she just wants a home that works or she doesn't really need to be an IT person for her house where it just kind of works and lets her know when things are wrong and kind of anticipates her needs. That's what we built. We built it with two products, could we build it with more products? Could we enable other people to build in their products? That was the greater vision and we had reached this point of scale where we could start doing that. So we were off to the races. We realized this could be a really big thing. At this point we were about 300 people, significant, significant revenue. And again, like the Valley often is not known for revenue.

Most start-ups kind of grow like this, but there is no dollars behind that, it's just users. We actually had a revenue curve like this. It's really good. One of those kind of things that investors really love. We were thinking like how do you grow this to the

next level? How much capital do we need? If we're going to be a thousand people with seven product lines, and all these businesses and full kind of mass marketing, how are we going to fund this thing? And we realized we needed a really big round. And it turns out, there are multiple ways of accomplishing this and looking at all the options, fortunately we had a really strong partner in Google and they had stepped up big time to help us accomplish this vision. So Tony and I, about eight months ago now, decided to sell the company to Google and this is not like in the classic kind of exit sense. It's in the kind of entrance sense, in that like ready to take on the big guys. So when you growing - trying to grow your company from zero to \$100 billion, there is a lot of steps along the way. And getting to your first \$100 million, your first \$500 million, there is still a long way to go.

And turns out Wall Street actually is very fickle. And they expect quarterly profits and it's really hard to invest long-term. That was all the advice we got from our advisors. So it was really fortunate that we actually could have the best of both worlds. And that's what we ended up doing. So, Nest is now part of Google. That said, we are a completely independent company. Like we are on the same path we've always been on, building the exact same product, the same vision, but with the resources of a big company behind us. It's really nice. It's really -- it's a kind of unique opportunity that most folks do not have.

Kind of our next stage, kind of where we are today and where we're going next is how do we kind of reach the mass? And that is a very big challenge. There are very few brands - at least very few new brands that reach mass. And when I say mass, I mean tens of millions, 50 million, 100 million consumers. That is a massive, massive reach. And very few companies ever get there. Like the kind of brands you think of, like in terms of mass brands out of the Valley, like Apple, Google, Facebook, Twitter. Like these are - like there are very few kind of mass brands that are created in the Valley, but we're trying to build one. And that is a mission that takes a long time. That said, it's something that we invest in. So we invest in new products.

We invest in the ecosystem. We invest in marketing. So you will see a lot of marketing from Nest this holiday season. It turns out it takes actually mass marketing. PR only gets you so far. At some point, you have to reach the mass consumer, another kind of big lesson. Also it turns out you can't do it alone. And this is a realization that we only had, I'd say about a year ago is it takes more than just our products to create an ecosystem. You really need to start bringing other people in. But there are very few brands that we thought kind of represented this conscious home vision that we wanted to go make.

So we kind of, we scoured the world, we talked to many folks and we realized that we could create a team within Nest to kind of help build them kind of in a greater sense. And we did that, we have more stuff coming there and more announcements in the next couple of weeks about Works with Nest. But this is a very big vision. It's really exciting. And that's why we are here today. It turns out like many people say like oh, has your life changed? Has your company changed? It actually hasn't and part of what I tell my team is like we have such a strong vision ahead of us, such as the kind of a big role to go build. We have to go build that and like let's not get kind of clouded in the Valley sense and the kind of inside baseball that happens here. Let's go build a great company and that's what we've been doing. So I am extremely informal, as you've seen. Very off the cuff and very raw.

But I would love to kind of take your questions and kind of how I can help you guys along your way. I've been in your shoes not that long ago. Sure, up front. So what motivated you to not push the thermostat inside of Apple itself, and then like breakout of a big company, because Apple has like all the resources to ...? It's funny you should say that. So ... Can you do a favor to repeat the question. Yes, so the question is why didn't I decide to build that thermostat back at Apple before I left. And it's funny you should say that. So my boss at the time, who was running kind of the iPod, iPhone division after Tony, asked me - he said like why don't you build your start-up within Apple? And I said, well it's going to take me a long time to get to \$1 billion revenue. How much patience is Apple going to have to get to \$1 billion? It turns out when you're making \$50 billion a year, like a \$10 million kind of project, doesn't really get them excited.

And this something that's kind of, it represents the inertia of big companies and something that I think keeps a lot of CEOs and boards up at night and in all my conversations I've had with senior leadership at Google, it's something that's very different about Google. Investing in new things that may never pan out is not something that big companies do very often, which is why we had to do it our own. There is really no way we could have done it within Apple. Like even now thermostats may never be a \$10 billion business, but it was definitely a key business that we saw to go build, to then go build the next big thing. To kind of build it into something bigger, but that would have been very difficult to do within Apple. To move the needle would have been almost impossible. Sure. Can you kind of walk us through the first few months when you came out with this idea? Did you immediately go to VC and start pitching ideas to get funding, were you working in a garage somewhere on your own with Tony or can you kind of walk us through that? Yes. So the question is, describe the first few months of Nest and kind of coming up with the idea through kind of that - the early days. So the early days of Nest were actually really unglamorous, I'd put it that way.

So Tony and I met at Madera, at Rosewood for lunch. It's kind of between his house and my office at the time. And we kind of had our big brainstorm like this is something we should probably investigate, something we should definitely look at. And actually we spend six months investigating and looking. So very unglamorous like, we did like lots of late night Skype calls, we

would hold ourselves in kind of walled conference rooms in friend's companies and just brainstorm and do white boarding and do internet research, cold call experts, which is a really funny thing like hearing like, so Tony Fadell, the guy who invented the iPod now CEO of Nest like cold calling experts at the EPA, like hey I have some questions about the thermostat industry. And people actually asked - answered, it was great. But it was really unglamorous. We did a lot of market research. We really wanted to kind of get it right before we said go, and before we started calling friends to hire them and before we called VCs to raise money. It was about six months later we realized, business is there.

And this is definitely a business opportunity. We could make a better product. It was clear like with our talents, with our skills, with our network, the products would be better for sure. That we could make a difference and that we could make a big enough difference. That was kind of our key metrics and we could do it in a reasonable enough time. This is not something that would take three, four years to get the first product done. And once we had that, then we started pitching first employees. And we hired about 10, 12 folks in that early days to kind of build - sketch prototypes, prototype UI, first industrial design, build the first prototype, early software, first app, at that point we realized like we had enough meat on the bones, we probably could talk to some investors. But we have the kind of - but the time we talked to our first investor we had like a full business plan. We had our go-to-market which completely changed by the way.

Like plans do change. The key is just to have a plan, something to - a guiding force to push the team. That said, plans change. They - I can guarantee you they will. Like no one gets their plan right on the first try. But yes, that's kind of the - the early days were completely unglamorous. We actually started the company in a garage. So Palo Alto real estate is really expensive as you guys are probably aware of and given that we didn't raise money and didn't - couldn't pay our employees, we just basically worked out of garage and it was an amazing experience. Like if you ever have the opportunity to start a company in garage, do it. It is amazing.

Like we actually name our conference rooms in our now glorious campus down the street after some of the kind of funny things we did in the garage, like no squirrels, like because squirrels would run in the garage. Seriously, there is a conference room called no squirrels, because we used to have squirrels in the garage. Yes, early days super unglamorous, but really, really critical. You want to make sure that you believe in what you're doing. And that -- because if you don't believe, like if you're not all in, if you're not a zealot for your cause, then for sure your first employees aren't going to believe you and for sure you're not going to be able to convince an investor. You have to have the kind of the whole picture. Other questions? In the back. Yes, how should we think about crafting the culture at Nest? Were there elements of Apple's culture that you tried to emulate or do differently when you started scaling the company? So how did we think about crafting the culture? Did we emulate Apple or did we do things differently? Little bit of both actually. So it was a very intentional process. So Apple did a lot of things really well and they still do.

Design; best in the industry, hands down right? They do. I think so. They certainly do very well. Deep, deep technological integration. Thinking about the end-to-end, they do that really well. Marketing, they do really, really well. Team culture, we wanted to change some things. We were a start-up. We are not a big company and we don't have Steve Jobs. So we knew we had to do things a little bit differently.

So we decided to do something that was very un-Apple, and to have a complete open transparent, non-confidential culture in the company. It's the exact opposite of Apple by the way. So back at Apple I had teams working on iPhone, iPod, iPad and the iPad guys couldn't talk to the iPod guys about what they were working on, albeit they were on the same team. So as you can imagine as a start-up, you can't really do things that way, otherwise your product probably doesn't work. So that was very early realization like we can't do that. Other thing we realized very early on is we're a small company, we're working in a garage, everyone's in tight quarters, we probably can't hire any jackasses. You guys laugh, it's actually -- it's a real thing we still do it. It's one of the first things the first interviewer usually asks for candidates is are you a jackass? And they always say no, but then we spend the next six, seven, eight interviews assessing are they really a jackass or not as well as are they great at what they do. That's something that actually has stuck with us like, we realize that working in tight quarters, everyone is working together, everyone needs to work well together. But actually as companies grow, that's a really good thing to keep.

So we don't -- when you say company culture, we don't have like these big plaques that you say like, this is what we stand for, here is the five things that are core principles of Nest, like we don't have that. We have a vision of what we're building and we have a great group of people and that's our culture. The people we have are our culture and the culture is more than just Tony and I at this point, it's hundreds of other people and a hundreds of other leaders. It's really exciting. It's a amazing thing to go build. In the middle. How do you deal with collecting lots of data for the Smart home? When you are planning to go into hundreds of millions of home, how do you deal with collecting so much data, especially in light of recent data breaches at big companies? So how do we think about data collection, especially as we scale? We think about it a lot actually. It's probably one of the biggest topics covered at the executive level in the company today. That and new product development business etcetera. Privacy actually number one issue that we talk about.

People are concerned about privacy and they should. The world has changed. As I said, like we've grown up with

technology, our parents really didn't. It used to be that you would have to get warrants for phone tapping all these kind of things, the world has completely changed. Completely, completely changed like - and it's something that companies need to take very, very seriously. So we're - I'll use the word transparent but it almost doesn't even describe it. So we are very literal about what we do. So we have a privacy policy, most companies do. But that's not what we expect people to read. So we have something we called privacy principles.

We publish it on the Web, it's something that I've talked about publicly many times. Guiding principles that guide basically well how we do development and how we do our work and how we establish trust with the user. So for example, like we don't sell information. That's not something we ever want to do, ever will do. We don't share information. If we ever do share information on your behalf for your benefit, for example linking your thermostat with your jawbone, so you could have your heating, cooling system turn on when you wake up in the morning. That's your initiative, you're going to do that and it's going to be very clear what you do and why and kind of what data is exchanged and giving you the opportunity to close and shut that link down at any time. We let people delete their data and kind of for - let us forget them. And also we don't collect data gratuitously, we do it kind of for their benefit and to give them new features. And what we have realized is, if we're very straightforward with people and we stick to our guns and we do what we say we do, people do trust us.

And we give them lots of great benefits. And people like that it turns out -- they like great benefits. That said, it's still not for everyone. And as we've scaled, as we've kind of entered the mass, we've decided very discretely, but we do talk about it, that you don't have to connect your devices. That you could build this conscious home without being on the internet, which is very controversial for most people in Silicon Valley like holy cow, connected devices not on the internet, that you could build this intelligence locally in the home and give people kind of control over their data. So, that's something that's very real to us. As I said, is always on our minds and I think as you guys build companies or work at companies, it's something that you should think about too. And most companies it's not on top of mind, but really should be and I think it's Nest's opportunity as a leader in our space to kind of lead the charge here. In the back. Could you talk a little bit about the negotiation process when you sold your company? Negotiation process? So we didn't really - I think we didn't really negotiate.

That's probably the wrong way to put it. But we only wanted to work with one company. There are very few companies in the world that invest in new areas, that may never pan out business-wise like Google. If you think about like Project Loon, like these hot air balloons that give internet to kind of third world countries or people that don't have internet. Self driving cars. Like these very bold initiatives, Google is willing to invest in those and what Tony and I realized is that is the exact right place for us to go build Nest. And we have the exact right partner in Larry. So obviously there is all the legal stuff and lawyers do their thing, but we were committed. This is very obvious for us, it was not a negotiation, it was the best way to do an acquisition. Could you elaborate on like I know you discussed your privacy policy earlier, how that works with Google? So I know because I ...

So how does Nest privacy policy work within Google? And the answer is completely separate. And it was part of the negotiations we had with Google is that, yes, we're going to be a Google company, but not really a Google company. We have our own office, we have our own management team, we have our own culture, our own team, our own data centers, our own privacy policy and they agreed. It's the right thing to do. Like people's home is their private place, they should be able to keep that separate from their Google accounts. So we do. That said, there may be cool integrations we could do or some things like Google map like as you're driving home, your house could kind of heat up on your way. But that's going to be your opt in, something that you want to do and you'll go to google.com/nest and say I want to link my accounts and this is what's going to happen and I always can unlink. It was something that we had top of mind and something that we've always had top of mind and that's one of the reasons why we're able to do the great things we do like, if we did Nest again within a big company, kind of fully integrated, we may actually not move as fast as we are now. Other questions? In the back? You talked about the importance of a start-up working on second or always the next product? Can you talk about why you chose a smoke detector and how that fit into the -- how that made sense as the next sort of bowling pin in the strategy of the conscious home? Yes, so the question is about why smoke detector and why working on second products, like why not iterate on the first? And I'll answer the second question first.

We actually did iterate a lot on the first and immediately after launching, the first thing we did was get on the phone with kind of customers, our kind of early customers, early adopters, hear what they're calling our call center about, what they're sending emails about and fix kind of any issues they had. Before you scale, you want to make sure you're getting ahead of those. And we even actually built a second thermostat immediately after launching the first one. We realized oh, there's some things we can do better here, we have some customer feedback here, we should definitely iterate and fix there. But at the same time, we realized that in order to grow the business in the way we wanted to, we wanted to enter another vertical. And the way we picked smoke alarms is actually very much how we picked thermostats. So overlooked product, everyone has got one, we can make a difference and we have the skills to make a difference. So we looked at kind of many products in the home. It turns out number one cause of fire death, like why people die in fires at home, is because they had smoke alarms, but the batteries are dead or they took the batteries out. Like that's retarded, like that is a basic user experience issue.

These things beep in middle of the night, their annoying, people hit them with a hammer, or take the batteries out and then they die. It's a really serious issue. And that's why we built the product. That's the whole point. That's why we did it. So like how -- why we built it? It was really that basic principle. It was that easy. Everyone has got one. They're frustrated with them. We could do a better job.

That's really how we did it. Other questions? Right. So did you always want to be an entrepreneur and then after working at Apple... Did I always want to be an entrepreneur? I actually never wanted to be an entrepreneur. From age five, I wanted to work at Apple and even when I was five, Apple was a big company. And there was a association with beautiful technology, things that just worked. If a child could use it, it's probably pretty good. And that was something that always intrigued me was building things that are really easy to use that a child could use. And I've always wanted to work at Apple and I still have a ton of respect for the company and a ton of respect for the team there. But what I think, what I learned at Apple is that you could apply that same ethos, that same methodology, the same way of building things to other things, and I think that's what we've done at Nest.

So I actually never wanted to be an entrepreneur, but I think some of the same skills it takes to build products to build teams are the same skills to build companies. Where and how did you learn how to do product - market research? How did I learn how to do market research? Google. Not at Google, but using Google. It actually - I'm serious, most of the early research Tony and I did was like we'd Google, thermostat market and like see, follow links there. And we'd say oh, this is an expert, this guy at the EPA who did ENERGY STAR for thermostats, we probably should call that guy. So we called that guy and asked him what he knew? And hey is there anybody else we should probably talk to that you know. And he referred us to this guy at Berkeley who did thermostat research and we talked to that guy and he referred us to some guy in Southern California, we called that guy and we started building our network and learning about the industry and it's much like you'd probably do research for a project at Stanford, like you don't go to the library, you start calling people, you start basically doing the rounds. I think a lot of people have talked about the user experience on your products and the design aspects. Beyond sort of you and Tony, is that something you especially hire for or something maybe you structured your teams in order to optimize, how did you create it? So how do you create great user experience? It actually is all about people. And yes, like Tony and I have a great user experience background, we built great stuff at Apple, but at our scale today like we're the final editors of when a product ships.

We have a whole team of folks doing user experience today in industrial design and user interface design. We hire folks. We hire the whole spectrum. We hire things from people who are new college grads and actually people who didn't even go to college to people who are very seasoned. And what we look for is empathy. People who appreciate what users have gone through and can get themselves in a users mind. It turns out when you build a product for yourself, it's not always the right product. I mean not everybody is a 30 year old male who lives in Silicon Valley. So it's actually really important and many people get this wrong. Build a product for your consumers and understand who they're.

So we actually know who our consumers are. We actually have like we call it eight profiles of people like different families, different demographics, different age groups, children, no children, retirees, still working, big house, small house and we put ourselves in their minds and in their lives and figure out what they need. And that's how our user experience is done. It's really actually -- it's very empathetic. And then we hire graphic and visual designers to kind of make that a reality. I think it's a little different than many companies do user interface design. How did you find your venture capital? I mean, if I want to become an entrepreneur, do I enter the market with a lot of my own money or ...? How did we approach venture capital and did we put a lot of our money in? So, yes we did actually put a lot of our own money in. Like not only our own sweat equity in that no one got paid in the early days, but like Tony and I basically funded the company for the first seven, eight months, basically first year actually. And fortunately we were able to do that, I mean we did okay at Apple. But when we approached venture capitalists, we started with people that we, one, knew, were highly regarded or people we knew or we kind of knew and trusted, like we did it based on our network.

The key was not like -- we didn't cold call people, like we asked people we trusted, who they trusted, kind of how you do networking. It's actually like really basic and fortunately we had a network of people who knew people. But I'm sure actually you know people who know people. It's like you may not realize kind of how small the world is and how close everybody is together. And that's actually one of the things that's really special about Stanford and Silicon Valley is I bet one of your professors knows somebody at DFJ, who knows someone at KP. There is in fact a amazing network here. So you guys probably are better connected than you may realize. So after looking back on this experience you've referenced that there are many things that you learned along the way and I think that making mistakes is probably a great opportunity for actually learning the most important things. And I'm wondering, if you could share your perspective as what is the single biggest thing that you have learned from making a specific mistake? So what is this single biggest thing I've learned from my single biggest mistake? Wow! It's a very, very deep question. So one of the earliest mistakes I made at Nest, it actually took me a long time to unwind.

It was a hiring mistake actually. So when your team is small, literally every single person matters, every single person

matters at 800 people, but actually every single person matters an order of magnitude more when you're five people. And one of our first 10 employees, I knew well at Apple, I had worked with him at Apple, and he was an amazing, amazing engineer at Apple. But was always kind of used to working at big company and was used to kind of all the resources of a big company behind us and didn't adapt well to a start-up environment. And it took me a very long time to realize that and a very long time to realize I had to get rid of him. And that was not an easy decision to make. It was kind of one of my first times letting someone go. But it was actually really hard to do. And it was not hard to do in that like I trusted him and he wasn't doing a great job, but it was hard to do in that like he was intertwined with the rest of the company and like how do you extract that out. Like when you have this group of 15, 20 people who are basically family like, how do you send one of the brothers home? It's really hard to do.

So when I say like biggest mistake and biggest learning opportunity is hire very well. And that's not just based on your gut, but based on your partners' guts, based on -- trust that kind of voice in your head. I actually had my own questions when we first hired him, like is this the right guy, is he going to be able to adapt and I'm like he is a great guy, he's going to be able to figure it out. And that's a good bet, and I was wrong. You can't always get it right. But I think the lesson learned here is not just hire well, but when you realize you done it wrong, fix it. And it's hard to do, but actually the sooner you do it the better. So yes, that's -- no worries. In the front. So you mentioned that in the beginning, in terms of business plan and strategy, you got everything wrong in the beginning of the Nest years and from an outsider perspective it's kind of hard to believe, so I was wondering to the extent that you can talk about it, if you could talk about some of the failures in the beginning in terms of business plans and how you guys went about fixing it? So the question is how did we get everything wrong yet make everything seem right and - we are really great at marketing.

And I'd say if there is things you could do well in a company, building your brand and building your marketing team, even when you're small. Now you don't want to do it too early, but at the right time with the right people, you actually have to do it. Actually all too many companies don't do this either. So literally everything went wrong, you know our first retail partner fell away, our first products, we had a bunch of things we had to fix, we had to scramble to fix them really quickly, we always made right with our customers that became our biggest advocates. We realized that the manufacturing center we were -- that was building many of the parts was shutting down and we had to move that to somewhere else. To the inside of the company, we were always behind, we were always struggling and we always got it wrong. And I think part of that also is our paranoia. And I think there is some truth to the old saying that the paranoid survive. If you're always worried about something could fail or if you're worried about the competition that you may actually do something about it. And it's not good just to worry, because when you just worry it just keeps you up in night.

Although everything pretty much keeps me up at night these days. But if you do something beyond letting it keep you up at the night, if you actually do something about it. So actually one of the things that we did in our culture that is worth noting, is we would start every Board meeting and every all hands meeting with a slide about highlights and lowlights. And we were transparent with our Board and our team. Here are the things that are going really well and here the things are going really wrong. And for each of things that are going wrong, what are we going to do about it? And we'd dashboard like this thing is red hot, we got to fix this. He is the guy who is going to fix it and he's going to fix it by then and here is an idea of how we're going to do it. And we're very tactical about it. One of our earliest employees, Erik Charlton, employee number three, actually was a Stanford business student actually. Said some things about like in business school they teach you about strategy and in fact the business world is more about tactics.

It's like 1% strategy and 99% tactics. So like we were very good at tactics, I'd say. Like be meticulous about the details. Not just about the design, but about everything we do. I had a follow-up question to my first one, it seems like you were a little non-traditional to your way of approaching investors. As a private company you invest your money, you hired people before maybe you approached VCs, what was the reason behind that? What was it that you guys did that? So we had a very non-traditional start. We invested our own money, we hired ahead of products, we did hardware actually and today people say oh, yes hardware sexy. It was not when we started by the way. That said, like we believed. And going back to I said earlier about zealots, like we were zealots and we still are.

When you believe with everything you have, like you're willing to do anything and the earliest employees were willing to do anything. And we believed that this was the right product, the market needed it and that we were able to make enormous kind of world sized impact with what we were doing. So we pushed all in and there was a point - late 2010, when I probably had \$20,000 left to my name which for a student may actually sound like a lot, but in fact when you have a house, it is basically zero. And we pushed all in and it was something that we felt very strongly that we had to do, that we had to build this company and we're really glad we did and the world is happy we did and we're just getting started. So I want to ask you the last question. Sure. 10 years ago you were a student. Yes. What do you wish you learned 10 years ago when you were sitting in the seat as a student? So I was a student 10 years ago in your chairs. What did I wish I knew? Don't be afraid, I would say.

So one of the things that you learn especially as an engineering student is actually it's important to take -- to not to take

risks, to think ahead. It's part of like what makes engineers great is that kind of deep, deep detailing like you're worried about this, like oh we can't take risks, we may create a bug or we shouldn't push that new release out it may disrupt the customers, it's okay to take risks. You should be measured with your risks, but sometimes opportunities present themselves that may seem completely world changing, that may change your entire life for the worse or for the better. But it's worth taking and it's not something you can learn in a classroom I think. But fortunately you guys are able to sit in classrooms like this and hear people like me speak about some of their crazy stories. And hopefully you guys go and change the world too and there is enormous opportunities out there and I really hope to see great stuff from you guys too. Thank you.