EPISODE 1372

[INTRODUCTION]

[00:00:00] JB: Welcome to Software Engineering Daily. I'm your guest host, Joe Baruch. I'm the CTO at Alvarez & Marsal Data Intelligence Gateway, or A&M DIG. Prior to which, I cofounded and was CTO of HuMoov, a vertical SaaS. I've been a software engineer at PayPal, IBM Research Labs and Qualcomm via the acquisition of Velocity.

Joining me is Fernando Gomez Baquero, the director of the Runway and Spinouts Program at the Jacobs Technion Cornell Institute at Cornell Tech, which is a technology campus of Cornell University located on Roosevelt Island in New York City. Fernando is a nanomaterials scientist and serial entrepreneur. He's built companies around composite aerospace materials, technologies for energy storage, and has mentored hundreds of companies mostly with deep tech innovations at their core.

He also manages a portfolio of 82 companies created at Cornell Tech and the Jacobs Institute with a combined enterprise value of over half a billion dollars. Fernando joins us to talk about his experience speaking to the engineer with an entrepreneurial spirit, encouraging the journey and laying out the core attributes of a process that can be taught, which will help the entrepreneur build a great company. He reminds us of what's mission critical and what can be left for another day.

[INTERVIEW]

[00:01:11] JB: Fernando, welcome to Software Engineering Daily.

[00:01:14] FGB: Joey, thank you for having me.

[00:01:16] JB: How about introduce yourself and talk to us a little bit about the Runway Program and Cornell Tech?

[00:01:22] FGB: Absolutely. My name is Fernando Gomez Baquero. I'm the Director of Runway and Spinouts at the Jacobs Institute at Cornell Tech. And I run a program called Runway Startup, a postdoc program, where we help scientist, people that have PhDs, recently graduated from PhDs, or have been out of their PhD just for a few years. We bring them here, we teach them how to be entrepreneurs. We help them build their company. And we basically build great companies out of the scientific environment. We focus a lot on digital. The people that we bring here are mostly people that are computer scientists, electrical engineers that are really working with digital technologies.

[00:02:05] JB: Could you give me a few examples?

[00:02:07] FGB: Absolutely. We have a lot of companies in the portfolio. We have companies, for example, in infrastructure. One company working using computer vision to be able to map instead of construction sites. And that mapping helps not just the construction side, but the insurance companies. Keep people safe. We have another company that is using computer vision and digital twins. They do it for bridges and for facades. They build a digital twin, and they can tell you if there's something that is damaged, if there's something that needs maintenance. They make the whole maintenance map. And right now they're working with a lot of bridges in the Netherlands, and they're trying to do digital twins of all of those bridges. We also have a lot of companies working on digital health technologies. We have one company that is working on optimizing the operation of nurses within the hospital. We have another one that is front and center in Covid. They had a technology doing DNA sequencing. They could do faster recognition of any virus out there. And they use it to recognize all of these different Delta variants. And now they even have, in partnership with another company, their own Covid tests. We have other company working on doing the data analytics for what's called stem cell lines. Basically this is a software that is able to track all of the results of stem cell lines, which are extremely used for preclinical research in pharma. We have companies that are working on cybersecurity to improve taxes information. We have companies that are working on digital solutions for mental health. I can go on and on.

[00:03:55] JB: Yeah, it sounds like a lot.

[00:03:55] KD: I can spend hours talking about all of these different companies. Yes.

[00:03:59] JB: How many companies do you have in the portfolio?

[00:04:01] FGB: Right now we have, in the Runway Program, 35 companies. Actually 37. Just in the last two weeks, we added two more. And that seems to be the constant thing. It's every two weeks or so we ended up adding new and new companies. It's really exciting.

[00:04:17] JB: So is this a cohort of people that get added every couple of weeks? Or they show up sporadically? How does that work?

[00:04:25] FGB: No, we add a cohort every September. We do annual cohorts. But when we bring them in, they don't necessarily need to have a company. And that's one of the key features or things that we work on is we don't expect people to come in already with a company formed. We are the ones that help people that basically are just saying, “I have an idea and I have no idea what to do.”

And so the people that we bring here, sometimes they just have that, an idea. They don't really have a company formed. And we work a lot with them. So even though we bring them in cohorts, I might get them to form a company then two, or three, or four, or six months later, or even a year later. Everyone has a different rhythm. So it's not one single solution for everybody. And we don't force them to make companies. We help them figure out that the value proposition is there, that what they're trying to do really make sense as a business. And once they figure that out, and they're certain of that, now they can go and register and build it as a company.

[00:05:28] JB: Got it. Does Cornell Tech provide any investment?

[00:05:31] FGB: Yes. In this case, is not just Cornell Tech for the Runway Program. This is a partnership with the Technion, which is the Israel Institute of Technology. And that partnership is called the Jacobs Institute. And where we provide funding, we provide monetary funding. We pay for the salary of the entrepreneur. We give the company some cash so that they can operate. And we also give them a lot of mentoring, training, resources, everything that they need. So overall, we account – We think all of that comes for about $300,000 per company.

[00:06:08] JB: So that sounds really exciting. I think in the audience of Software Engineering Daily, there are quite a few innovators, technologists, people that have these ideas that they believe could be helpful, or at the very least they know are super cool. But can you speak a little bit about what makes for an idea that you can build a company around and you can monetize and create value out of it?

[00:06:30] FGB: Absolutely. First off, data is very common. And I think for this audience, I will love this audience to know that, that it's pretty common for a software engineer to say, "You know what, I have a great idea. I see so many things." And software engineers are out there looking at so many different things. And they're watching, they're understanding. They see a lot of problems. And because of their nature they would say, "Wow, I think this is interesting. I could solve it." And they have many different ideas.

So it's not uncommon for someone like that to have an idea and have no idea where to get started. So I just want to put it out there that it's important to know that it's common. It's important to realize that. I's also important to know that there are lots of people out there that can help like myself. But there's plenty of resources where people that have great ideas.

Then once you have that idea, the next thing that I would prompt people to do is get together with people and talk about it. And this idea that you need to not talk about what you're doing, the stealth company, I don't like that. I personally hate it. The idea that you need to keep quiet about something that is interesting and something that's exciting. Why? Why should you keep it quiet? Go and talk to people. Go and talk to your customer. Go and talk to that person that has that problem. And go and ask them, "How is it that you're solving it right now? Why can't you solve it before? What are the other things that you've tried?"

So the more that you talk to people, the more that you understand not just the problem itself, but also all of the things that surround the solution. That's extremely important. Because just because there's a problem and you can solve it a particular way doesn't mean that either the system, or the company, or where their problem lives know or can integrate the type of solution that you have.

So go and talk to people and figure out. We call it customer discovery. Just really go and figure it out with your customers if you really have a value proposition. And once you do that, then you can start focusing on, “Okay, what else do I need? If I really have a good value proposition, if this makes sense, if I know that the customer wants it, because the customer told me the problem and because customer basically told me, “I have this problem. And I need it solved.” And it's an important problem. So if you have that now you can start focusing in the other parts. And the other parts are how do I keep track of my customers? So how do I engage with them? Was there customer relationship? How is it that I get this product to my customers? What do I need to do internally? What type of resources do I need? What type of partners? How do I price this? All of those things now are coming into place.

In general, I would say that the best ideas, because that was the original question, is the best ideas, are the ones that go through this process. It is, I think, extremely rare. Or I would say that I've never really seen an idea where someone would just go and say, “Oh, this is a great idea. I would build it.” And immediately like in a heartbeat it would just become a humungous company. We tend to think that that's the way that things work, because we sort of like just see the past and forget that companies like Facebook or Slack just took years to actually be made. We think it’s very fast. And that's not the case at all. These are ideas that needed that, needed a lot of exploration, needed a lot of, “Okay, how is it done?” My customers are seeing that they needed some time to mess up. And they did in a lot of things. They needed to iterate.

So the best ideas are the ones where there's a process. That's really the case. There's no magic potion, right? There's no magic dust, no magical fairy dust for an idea. It's a process. And I think that the best entrepreneurs are the ones that can get into the journey and understand that process and go through it. So it's kind of one of the same, right? It’s not something magical. It is a process that, by the way, can be taught. And that's what we think here at Cornell Tech, that we can teach them that process. And we can teach them that methodology so that they can build those ideas into companies.

[00:11:06] JB: I really do love that answer. As a second time founder myself and working off of the experience of my peers, I really do see that when you cling to IP and you hold your cards close to your chest, that's really when you also find you're stumbling or finding it difficult to create value. I've also seen people sort of go off with this idea, develop it for years and refine it

without talking to anybody about it. And then when they come out to the world, that idea was developed 10 years ago, and it's already behind the market.

[00:11:43] FGB: That might be what happened to a lot of people, right? And it has happened to me too. I've been stuck inside of a lab for three years developing something that once I went out, I said, “Oh, crap! I should have gotten out of the lab about two years ago.” So it's quite common that that happens. And I think that right now, things move so fast that we need to start teaching more people to be more open and just be out there talking to everybody that they can.

[00:12:16] JB: Can you give us – If I'm standing on one leg, can you teach me that way? How do I – What's this process that you can teach at Cornell Tech? Give me the headlines?

[00:12:28] FGB: Well, the process really starts by understanding a problem. And I think that the first thing that one has to know about that is that the problem is outside of you. And that is sometimes difficult, because obviously we live in our own world, and we see our own problems. And I might be a software engineer in a large company. I might be trying to find an apartment and say, “Oh, there's a lot of problems with trying to find an apartment in New York City,” just to put an example. So we tend to really focus on our own problems and say, “Oh, I want to solve the problem that I see in the world.” But I tend to teach people, first start with is this an outside problem? Is this a problem that someone else has? If you have it and you're passionate about it and someone else has it, that's awesome. So now you're building something that you could be a customer, but other people are also a customer. But if you have it and no one else has it, that's a problem, right? And that happens a lot. So you need to take a look outside.

And sometimes you can be amazing entrepreneurs solving problems that I don't have. And I've done that. I've built companies where I build something from someone else. And I know that he's a great market. And I know that he's a great idea. But it's a problem that I particularly don't have. But I'm very glad that I don't have it. One example is affordable housing. I’ve worked on a project on affordable housing. And I don't have that problem, but someone else has, and it's a big problem. So you just need to go out. That’s the first thing. Go out and find that big problem that might or might not be your problem, but just make sure that it has a market big enough so that when you go out there, you can say, “Okay, it is worth solving. There is a market for it.

There is a need for it. I can create value for someone else." And that is the first thing that I would tell everybody to do once they're looking or they're considering building something.

[00:14:30] JB: Do we often have an idea and then look for a problem to fit it? Or is it the other way around? A little bit of both?

[00:14:39] FGB: I think we do both as human beings, as engineers. We just take our knowledge and we try to fit it and solve problems with the knowledge that we have. That's not bad at all. There is a lot of tech push, which in a sense is kind of normal, because if we know a lot about a particular technology, if we know a lot about machine learning, hey, we just want to apply machine learning wherever it is possible. If computer vision, we're trying to do everything computer vision.

[00:15:07] JB: Right, right. Give the kid a hammer, and then everything's a nail.

[00:15:10] KD: Yeah, exactly. And that happens all the time. And engineers think that way. And we do need to teach. I think, in addition to good engineering, this is not bad, we need to teach a lot of empathy, which is also going out there and saying, "Well, is the person that is out there, do they really need me to solve it this way?" Do I really need to hammer it with this hammer? So I don't know. I can maybe say that I have so much knowledge that I have Thor's hammer to say something like that. But it really just needs a tiny little hammer. It's not that complicated. And so why would I use Thor's hammer because to nail something that is too tiny? And we need a little bit of empathy for that and need to teach a little bit of empathy on not everything needs to be solved with the knowledge that I have. But if there's a problem that needs to be solved, there might be a simple solution. There might be something that I can do that is not too complicated. And I think that is quite natural for us as engineers to go there. But that's also why having a community around you is important.

And I think a lot of my time, to be honest, I spend coaching and mentoring companies, is telling them, "Why are you making it so complicated? It doesn't need to be that complicated." And once they realize it doesn't need to be that complicated, they're like, "Oh, okay, I can do that. It's not that complicated. I can do it." And they can go to market fast. And they build things that are worthwhile.

[00:16:42] JB: Yeah, I think you're alluding to something that in my experience I've also learned, which is the lean methodology, the minimum input for maximum output. And it feels like this is the next headline of the chapter of the things that we learned in our process, right? We've described the problem. We've created the framing. We validated it by talking to people. And then we need to find what's the minimum viable solution, right? But I also feel like this minimality doesn't just apply to the solution. It applies throughout the entire process, right?

[00:17:25] FGB: Yeah, I think that you need to be very aware of what is it that creates value? I think that the agile methodology is not just about minimality. It's really about trying to quickly figure out what is it that creates our value? What is it that gets us to that solution that makes sense, that really creates an impact, a significant impact? That if you deploy it, someone is going to say, “You know what, it might not be perfect, but it actually solves a huge headache for me.” And that's really what agile – Agile is trying to get to that faster. And it’s iterating and trying to get that faster. But it's not necessarily that needs to be minimal. It's just that we need to get something to something faster, because we as engineers and scientists tend to try to make things perfect. And that's not good either, because we can take years trying to make something perfect. So that really doesn't work.

I think that I wouldn't really necessarily say that we need to do things that are minimal all the time. There are systems that are pretty complex. And sometimes you do want to make something that is not just minimal, but is delightful. And you do want someone sometimes to say, “Well, part of what I will deliver is that delightful experience.” And you got to know there are companies out there that have thought about that. And of course the case of Apple comes in, right? So it's a company that thought very hard. Not just giving something minimal that work, but really saying, “How can I make this a delightful experience?” So that's not bad.

I think that what's bad is if you spend too much time developing something that creates no additional value. Delightful experiences create a lot of value. If you are able to deploy a product and then your customer not only gets the value, but also feels overwhelmed as for it being good, that's great. That creates an additional value. But if you spent too much time doing something, and at the end that result was the same result that you’d have gotten six months ago with that first type of deployment, then it doesn't make that much sense. So it's more about thinking about

value rather than just the minimalism. Minimalism is not as important. What's important is really what is it that you're delivering, and is it valuable for the person that wants to use it?

[00:19:47] JB: Going off on a bit of a tangent here, what you're describing makes a lot of sense to me when we're talking about a b2c. But how does a delightful or the quality of delightfulness of a product, how is that relevant for a b2b scenario?

[00:20:04] FGB: It's absolutely relevant. And I think that one of the biggest problems is that we don't consider that a b2c experience. Sorry, that a b2b experience is also could be and need to be delightful. You need to think about b2b, and every single business, you need to think that there's someone that will use your product. There's a person that will use their product. So, yeah, you can say, “Oh, it’s this company that is using my product.” No. It’s a person, flesh and blood, in front of a screen using your product. So how is it that you make it delightful for that person? And that's one of the things that I've never really understood, is the differences. Everybody says, “Oh, yeah, b2b is so different from b2c.” Well, we're still talking about giving value to people. We're still talking about making products for people, because it is not Microsoft that is going to use the software. It is a person within Microsoft that is going to use that software. So all that you need to figure out –

[00:21:04] JB: But very often you'll find that the person that uses a software, and the person that shows which software was available to the first person, are not the same.

[00:21:16] KD: Absolutely.

[00:21:16] JB: So then creating that delightfulness for the end user doesn't necessarily help your sales cycle.

[00:21:22] FGB: And that's a good point, is that if you're talking about selling to businesses, the end user might be different to the economic buyer. Might be different to the one that is making the decisions. So they're more actors. It’s an ecosystem that has more people involved. And so you need to figure out how is it that this delights all of those people that are in that ecosystem. So in that sense, it’s way more complicated. You're absolutely right.

But that doesn't mean that you can't think, “Well, how is it that the end user will use it? But how is it that that economic buyer gets advantage of it? And how is it that the people that actually need to sign the check, how do I make it easier for them?” Even in the process, you can make it easier in stuff that we think is not that great. I mean, payment systems have gotten easier. And the fact that you can make it easier for someone in a purchasing department in a larger company is important too. So yes, it's a more involved ecosystem. But that doesn't mean that you couldn't make it a better experience for everybody. It just takes a little bit more work.

[00:22:26] JB: Right. And I suppose that then onboarding, and off boarding, and transferring in from some other legacy system, making that process super easy would reduce the cost of your potential clients transferring onto your solution, which I see your point.

[00:22:44] FGB: But with that, I like to think about it a lot, is reducing friction. And I love that. I love talking about it that way, and it’s we have so many steps to do things. To purchase something, we have 10, 20 clicks to get to the system, we have to do 80 clicks. Just opening the laptop and put a finger putting all of this stuff is just all of these different things that we need to do. And if we can reduce the friction, which are all the steps that we need to get to something, that really makes it so much easier. So I think that that's part of making an experience more delightful, reducing friction. And part of that is, yeah, the transition needs to be easier, right? So I need to be able to do it.

This is a big, big problem in the medical field. engineers that have been doing software for health technologies for the medical field know that it's a pain, because a doctor does not want their regular flow to be changed. It's very difficult to change it. And if you are one click to something, it might just add them a whole bunch of time that they don't want to lose. So there are systems that are very, very aware of that. Little changes make a humongous difference. This isn't where maybe it doesn't matter that much. But if you are like in the medical field, adding something that needs two or three or four clicks, that might mean the difference between seeing two or three more patients today. So that's a big deal. And you need to work on making sure that that doesn't happen.

[00:24:15] JB: That's interesting, because I've always thought of friction as something that impacts your marketing funnel. But now you're saying it can also impact severely your

operations, in your example of the doctor. I kind of like that we covered finding and framing the right problems. We covered minimality and complexity. And now you're talking about friction. So can you talk a little bit about how friction can impact, on the one hand, the operational aspect of your solution? But on the other hand, the marketing funnel. I mean, as software engineers, most of us might not know about this. But how important is it?

[00:24:58] FGB: I think that in both cases are pretty important that we take a look at what we're building and make sure that is easy to use. And again, that we're changing in comparison to the status quo in a way that is not going to make it complicated for a user in a way that is able to deliver that value. People are willing to do more things if it gives them the right value. And I am willing to go through more steps if someone saves me money doing something, right? But it needs to be a significant amount of money. I'm willing to spend time.

So like the Geico Jingle, right? So I'm willing to spend 15 minutes to get to something. But in a general sense, if you are trying to design a solution, as an engineer, you should be thinking, "How do I make it less complicated?" Because if you make it less complicated, and you are value, then the better, right? So that's all on that side. I feel that we always should try to reduce the steps that gets to something as much as possible. And to be honest, we have the tools for it. If we were having this conversation 30 years ago, I would tell you there's no way of integrating different types of software. There's no way of integrating different types of systems. We don't have API's. Maybe at that point in time I don't remember myself talking about API's at that point in time. So three years ago is much more difficult. I don't think that there's any reason right now why we couldn't say this, "Let's go that extra step and give a little bit much easier solution to the customer."

Now let's talk about it from the marketing point of view. So from the marketing point of view, you're right, our whole goal is conversion. Our goal is it's expensive to attract people. Whatever you're doing, trying to get to people is going to be expensive, and we need to convert them towards solution. We also need them to get stuck to our solution, right? The stickiness is also important. So how do we get someone to quickly get to know us? Immediately turn the light bulb on and say, "I have that problem. I like this solution." Convert. So immediately go to the action, and then get the value benefit. And for us, obviously, not make the sale. So that's also really important.

But I come back to the same thing. It is important that we sort of shorten those steps. And hopefully we make it easier for someone to get to that solution. But they need to get to the solution. If they don't get to see the value, that's the biggest problem, I think, right? So when you put too many layers, and at some point in time you're like, “I think I can see the value, but I have so many steps doing it, and I end up having so many steps that I never really get to see it.” Then all of a sudden, there's no value, right? The friction just basically stopped everything. So you need to get to the point in time that your steps are simple enough that someone can get to see, “Okay, this is valuable for me. I understand that it. It solves my problem.” And then I'm willing to pay for it.

[00:28:04] JB: Let's put a pin on the marketing thing for a minute. I remember being a software engineer and thinking that design is a commodity. Having a designer, I'll build a product that I build. At some point, I'll just pay a designer to come and make it pretty. Two startups later, I've been proven wrong several times. But let's pretend I didn't say that. And convince me, why do I need a good product design process? And from what stage should I get it?

[00:28:35] FGB: That also makes me think I had the same experience before. It was by learning by doing that I understood the importance of design in software designing product. And I felt the same way at the beginning. If you're an engineer right now, what I would tell you is take a look at it from the point of view of the value that you want to create. And how is it that you deliver that value in a very impactful, but also in a way that you become memorable? And then there's a big difference between just building things and building things that are memorable.

And what I tell people is if you build things that are memorable, if you build things that are amazing experience from the get go, then people are going to get stuck with you, because people like that, and also because people are kind of lazy, too. If there's something that we like, we’re going to say we’re the same thing right. Because, hey, I like it. And yeah, I'm the same way. I like it. And I’m not really going to change. I’m kind of lazy. So the status quo is fine. And it gets to be a little bit sticky.

But stealing someone from something else that they're doing, because that’s literally what you're doing. If you're putting out a solution, you're stealing that person from another process.

Stealing someone right now requires for you to grasp retention to make things really, really interesting for them, to make things really simple for them. And that is just – Part of the times is that we have so much info coming to us, then we need things that are simple, that are not overwhelming, that we can understand and that are effective. That I have so many things every day, I have messages, all these texts, all of these emails, all of these Slacks. Everything is coming at me all the time. All of these things are competing for my attention. So you have to go out there and compete for the attention as well.

And if you think that you can do that just by having a good product, I think that you could get away with it maybe for a little bit. But then someone else is going to come and grab that attention. So that's why design is really important. Because you need to strive to do it even a little bit better, to have that delightful experience to go a little bit above and beyond. And at the end, the product itself is not necessarily what's going to keep you alive. And I think we see it over and over again. There might be a couple of companies out there that I can think, “Okay, their product survived, even though it's kind of a crappy product.” But it’s extremely rare. And I don't think that we need to take that as like the ethos, right? So it's not just about product. There needs to be more. And that more is that. It needs to be integrated in design. There's not nothing else that you can do about it.

[00:31:35] JB: So tell me about threats. What are the most common threats that a startup that's just getting started? Maybe it doesn't even exist yet? What are they facing?

[00:31:45] FGB: Well, the first threat is not having customers. And that's a big one. And basically why you get to that threat of not having any customers is because you're building something that no one wants. And it touches a little bit of what we were saying before. It may be something that I build because I thought it was great. So as an engineer, I did 400,000 lines of code. And I think this is amazing. And then I put it out there and no one wants to use it, right? So how come? Everybody is stupid. No, people are not stupid. People, they just – That doesn't solve their problem, right? It might be very elegant, but it doesn't solve their problems. So that's the first threat, is do you have customers or not? Is this a problem or not? And is what you're doing valuable or not? Is it solving something that is a big pain? It's urgent? Maybe it's unsolvable? Maybe it's unavoidable? You need to think of all of those things. And that's the first threat.

There are very interesting studies about why companies fail. There's always that first one. And I think if you go to YouTube and you Google, “Why do companies fail?” There're a lot of lectures on that. And it always says, “Well, they fail because –” There are two bands there. One that says it’s the wrong value proposition. So basically, you didn't have customers. You were building something that no one really wanted. The other one that it says is bad timing. So bad timing, right? But bad timing is the same thing as value proposition. So if no one said it, they want it 10 years from now. Then no one wants it today. So it's still the same thing. There's no value proposition. So that's the first one.

And if you take a look at that one, what happens is that everything else stems from that. If you don't have a good value, if you don't have a good customer, then what's your next threat? Is that because you don't have any customers, you're going to run out of money? That's super clear, right? So you burn money, you don't get any customers, and you're start running out of money. And now you're saying, “Oh, no, I'm running out of money. What do I do?” Now you're constrained with money. You either have to let go of your great people that are costing you a lot of money. So now you get stuck with maybe people that you can afford, but they're not as great. So now the team is not the right one, right. So from that now seems that the team is not the right one. Now you have a team that doesn't really work. Now, that team that doesn't really work doesn't really know how to build things that you need to build. And then all of a sudden, everything just like continues to just like fall apart from all of that. So I just see it as one main threat. And all of those other problems just fall from that main one.

[00:34:25] JB: How do we mitigate this? If we are getting into this vicious cycle of going down the drain, how do we stop and reverse the process?

[00:34:35] FGB: I think the best way of doing that is you need to be that that type of person, even if you're an engineer, that understands your customer, and listens a day in the life of. The best companies that I've ever met are the ones where the entrepreneur can tell me. “Look, I can tell you exactly what the day in the life of my customer is.”

I remember a company that I was mentoring, and they were working for a solution, like a little robotic thing that like exoskeleton that help people stand up. And it seems interesting technology, exoskeleton, right? So robots, motors, all of that good stuff, right?

[00:35:21] JB: Yeah, we've seen that in sci-fi.

[00:35:23] FGB: Yeah, exactly. But now it exists. It's great. They build it. That's absolutely awesome. And they were saying, "Well, we can go and we can go to a house that has – Not a hospital, but one of those houses that has people that are doing rehab, rehabilitation. And people that are going to do rehab are really going to love it. Someone that has some problems, and maybe they can't stand up well. They're really going to love it. That's going to be great. That's going to be my group of people." And they went out there. And you know what? All of a sudden, by being with them, understanding how everything worked. They turn around and they say, "You know what? Yeah, the people and the beds, they can use it. But they're getting rehab. They'll get better. And they won't need it anymore." You know who needs it constantly? The people that actually helps those other people, the nurses. Why? Because they are making the strain every single day. And they're the ones doing the rehabilitation."

So all of a sudden, knowing your customer journey gave you the insight that you needed to understand where your product really created value. And so these people could tell me when a nurse got their – How many people did they see? How many shifts did they have? What type of person had to lift more people? What type of patients were more critical? Really a day in the life of.

And I think, for engineers, sometimes we just get put like in teams of engineers and we're far away from the customer. And I think that's a mistake. Engineers need to be closer with the customer. And it's not necessarily that they need to go and sell stuff to the customers. They need to sit down and say, "Okay, well, how is it that people really using what I'm building?" And if you get to know how is it that they're doing it day to day, you understand much better if what you're building makes sense or not. That's really how you solve it, is getting more people to connect with customers and listen to them and understand their day to day.

[00:37:21] JB: Man, what a classic pivot story started building this exoskeleton for patients that may have lost the ability to move or walk. And then by understanding a day in the life of the patient, and not being myopic, just looking to the sign saying, “Hey, this person here is doing all the heavy lifting. They're perfectly healthy, perfectly fine. But actually they need it more.” That's a crazy pivot.

[00:37:48] FGB: Yeah. And I have done stories like that. And this is the beauty of that customer discovery process of just opening up your eyes and saying, “Let's take a look at how people are using this outside.”

[00:38:01] JB: What actual action item, daily practice, as a founder or engineer do I introduce into my day to day to get better at that?

[00:38:11] FGB: Look, I wouldn't say that you need to do these every day. Also, **[inaudible 00:38:17]** crazy expectations, right? When you're a founder, you have so many things to do, that there are days that you would sit down and code. There are days that, I don’t know, you might need to go and take a walk because it's very stressful. But I do think that you need to at least day to day really think very well, “What I'm building, does it make sense in solving that problem?” And in your daily interaction, do as your team, do as the people that are around you. For the most part, what are they think?

Feedback is important. And if one of the things that I've learned and that I've gotten much better at right now that I'm in my 40s compared to when I was in my 20s, when people say, “You know what, I think that's a stupid idea.” I love it when people tell me that. I love it when people say that because, first off, they're being really honest. It's not easy to tell someone that that's a stupid idea. But when they say that, I started thinking, “Okay, why is it that they think that they're stupid and just take it with a grain of salt? I don't think that anyone is kind of insulting. It's just really fostering an environment where someone can say, “I don't think this is going to work. I think this is right.”

And I think that is more like a day to day practice is fostering an environment when someone can tell you that something doesn't smell right, that something is not wrong. I don't think that you would necessarily need to everyday go to the customer. Again, it says very – As a founder, there

are too many things that you're doing. But if you build that environment and that culture in your company, that definitely is going to help you. And that is a daily thing where you yourself also are saying, “Not only am I giving feedback to other people. I'm letting other people give me that feedback and telling me when they think that things are wrong.”

[00:40:08] JB: Yeah, that's very important. Creating the right culture in your organization so that you empower your people to speak up, build, feel ownership. Very hard to do, but absolutely agreed. Tell me about CAC and LTV.

[00:40:23] FGB: Okay, so CAC, customer acquisition costs; and LTV, lifetime value. So those are the two things that we take into account when we talk about customer relationships. In the simplest sense of a them all, you want your customer acquisition costs, which is how much money it costs you to acquire that customer. You want that to be lower than the money that your customer gives you, which is the lifetime value, or how much money does this customer give me over the whole lifetime of that particular customer being with me. I want more money from my customer than it cost me to get that customer, pretty straightforward.

And really, there is no particular number on what should be the multipliers when people say, “Oh, the item value should be 4, 5, 6, 30,” I don't know. That's not really that important. Every business is different. And I think I wouldn't put a lot of effort into defining a particular number on that. But there are some things that I do teach the companies that I mentor that I feel that are important. First off, a customer acquisition cost of zero is not a good thing. And a lot of strap, bootstrap companies go out there and then they put on a slide, “I have a customer acquisition cost of zero.” And all that tells me is that you're too cheap to actually spend some money trying to go and talk to customers and acquire customers. No. Customer acquisition costs shouldn't be zero. It should be a number that, of course, it shouldn't be ridiculous. But you should spend some money in trying to reach your customers and being close to your customers and trying to make experiences to attract your customers. There needs to be something like that. And then do benchmarks on that. You just need to make sure that your conversion is important, right? So the customer acquisition cost is how much money you're spending attracting all these people? But at the end of the day, is really divided. All your costs divided by the number of customers that you really got. So you need to convert. You need to make sure that if you get 500 people, you got a high conversion rate, right? Because if you get a million people, but you only get one

customer, that's not a good thing. Now, conversion, don't make it zero. Make it a positive number, but something that you can really work on that is good.

And then lifetime value, we come back to the topic of stickiness. And for me, the most important part is lifetime value is how do you get your customer to really think, "You know what? Changing is just more of a hassle." And this is what big companies do extremely well. Like Apple does this extremely well with saying, "Getting out of this ecosystem is a pain. And so why would I buy an Android if I've been using iPhone 4 now five years?" And Apple knows it. So that's all lifetime value. They're saying, "This person is going to buy from me again and again and again." So that stickiness is kind of important. And you need to think of ways not just of attracting that first customer, but the lifetime means that think about how do you get a customer for the whole lifetime?

We have a company. I like this example. We have a company called Nanit, which is a baby monitor that has computer vision technology and helps parents sleep. And it helps babies sleep, right. But the ones that also get the benefit are their parents, because if the baby sleeps, the parents obviously sleep as well. And I was having a conversation with the founder. And it was interesting how the vision was, "Look, we have people. We're doing analytics for sleep for this baby for year one. And then we have them for year two. The model also for year three. How do we keep increasing that?" And literally it became, like in my mind, is how do you get analytics for a lifetime of a person? That is super interesting just to think about that problem of, "If I'm doing sleep analytics for someone and I start day zero," which literally what they do when someone is born, "how do I get them to be with me for a whole lifetime?" I found that like fascinating and a good example on the challenges of doing lifetime of any type of product. So that's the other thing that we need to think about when you're talking about lifetime value, is how do I keep giving something that would be valuable at one, or two, or three, or five, or 10 years? That's extremely difficult to do. But it's important to think about it.

[00:45:01] JB: Thank you for that. NPS, what is it? Why is it important? Do I need it?

[00:45:07] FGB: Net promoter score, NPS. I think it is important in the sense that you'd need to benchmark against either yourself before or what other people are doing. I'm not a big fan that

much of NPS scoring. I know that a lot of people use it. I know a lot of people are out there trying to say, “Well, I need my NPS. And how do I keep making this better?”

I think if you use that metric, because you can use other metrics just to benchmark what you're doing and the progress that you're doing, that's more important than the value itself. And I'm just talking, now, this is generals of all of these other KPIs, or OKRs, or however you want to call it, whatever you want to put there. It’s less important to put up a specific number. More important is how do I start tracking it to know that I'm improving or not improving? To know that whether that campaign that I did really worked in a possible way or not. Whether that little change that I made to my UI made any effect or not? So whatever you're doing, just don't get too hung up on the number itself. Get more hung up on the progress that you're doing.

[00:46:29] JB: Thank you for that, Fernando. We have a quite a day. We've talked about a lot. Framing and looking for the right problems. We talked about complexity and minimality. Friction as it impacts your operation, as it impacts your marketing funnel. We talked about marketing, product design, the need for a designer. We talked about threats and avoiding them. Pivoting when needed, building culture, CAC versus LTV. What's mission critical? And what I can leave for another day and think about it later?

[00:47:05] FGB: So for all of those software engineers that are listening to us right now, I will say mission critical for you, if you're thinking right now on how do I build a company? Or how do I build a product that really becomes a solution and becomes something big? So mission critical for you is to be absolutely honest with yourself on whether this is a problem that is big enough that is worth solving. Mission critical for you is to be or find the community that helps you understand the things that you don't see. That is mission critical. That you go out there and find those people that have telescopes when you might have blinders. Find that community.

Mission critical for you is to sit down with a customer and understand what are their problems. Mission critical for you is to, once you talk to them and you understand that you messed up, correct in a very honest way. Mission critical for you is to deploy something that you know that it creates value, but be honest about what you're deploying it and why. Mission critical for you is to say, “Okay, I can definitely build this, or I cannot.” That is also mission critical to say I cannot. And if I cannot, who can build it for me? Mission critical for you is being able to map out what

you want, and not just of the product, but also of the company, and be able to communicate that.

So I'm sorry to say that there're lots of things that are mission critical that you can't really leave them here. And I think that at the end of the day is the part that you need to understand is that no company was built in the 15 minutes that we've been talking. No company has been built in one or two days. The best companies out there have taken a lot of time and have pivoted. I can tell you stories about the craziest pivots that we've ever seen. And people that are good entrepreneurs just try different things. And what they get very, very good at is the fact that they can see something and say I was wrong. And just fix it. I was wrong. It shouldn't have been this way. Just come back and do it.

So maybe I'll end with that. Maybe the mission critical thing for you is, all through this process, understand that it might take time. You might be wrong. But if you sit down and build it, then whatever the journey is, is going to take you to something that is really interesting. Now what's missing? I know in the future there is going to be a lot of stuff that are going to be missing. And it's going to take a lifetime just to solve a lot of these problems if there are problems we're solving. So don't be too stressed about solving it all right now.

[00:50:09] JB: So we spoke about resources available. Do you have any other top of your head you can give me and I'll add them to the show notes?

[00:50:18] FGB: Yeah, so for everybody else that is hearing us. If you are in New York, New York is a wonderful place right now to be an entrepreneur. There're tons of resources. There're a lot of incubators, accelerators. Go and talk to universities, because universities are very open and want to talk to you particularly here in New York. Obviously, Cornell Tech is a great place if you can get connected. But also talk to universities like NYU, Columbia, SUNY, CUNY, NYU. There's a great – Rutgers. And I can list all of them. But go and be part of your community and try to find – I think that is important for groups of mentors, right? Sometimes you find them in incubators, accelerators. Sometimes you just find them in group of angels, for example. But key resources, go and find someone that you can talk to that is a good mentor. And go and find communities of people that have the skills that you don't have. And those are the best resources. And every place is going to be different. If you're, obviously, in larger cities, it's going

to be a little bit easier. If you're in smaller cities, it's going to be a little bit tougher. But the good thing right now is that on Zoom, we're all finding very interesting resources. And I usually don't blog, a lot of products. But the one that I've seen that has worked absolutely wonderfully for this is Lunch Club. Believe it or not, it's a very fascinating way of meeting people that you wouldn't normally meet. And it's great way of meeting mentors. Great way of meeting cofounders.

[00:51:52] JB: Wonderful. Thank you. How might a listener reached out to you if they wanted to?

[00:51:58] FGB: I'm super easy. And I always give my email. So fernando@cornell.edu. I made it easy for people so that anyone can write to me. Or just find me on LinkedIn with my name, Fernando Gomez Baquero.

[00:52:13] JB: Fernando, thank you so much for your time. This has been an absolute pleasure for me, read, living and relearning the journeys and experiences that I had, even some of them with you back at Cornell Tech. It's always good to hear that again.

[00:52:28] FGB: Thank you for inviting me. And you're the demonstration of that, the resiliency of the entrepreneur, the person that at the beginning is like, "Oh, I really liked this." And then kind of it didn't go the way that you want it to, and then it did. And so that is the journey of the entrepreneur, which is trying to iterate and change and do things the right way. And thank you. Thank you for doing this. Obviously, to all of the audience here also. And as Joe has done today, if at some point in time you're able to succeed and you get some learning, please share it with the world today. There're a lot of people out there that are trying to get started. And I think that we have the responsibility to help them get started.

[00:53:12] JB: As always, Fernando, you're the man. Thank you very much, and have a great day.

[00:53:17] FGB: Thank you. You too, take care.

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