# Podcast Episode #37 – Disrupting with digital manufacturing, with Nick Pinkston of Plethora, USA

## RAW TRANSCRIPT OF INTERVIEW

**Balint:** Today on the podcast we are back to the topic of manufacturing, one of the essential elements of creating a hardware product, so physical products. I'm glad to talk to Nick Pinkston of Plethora. Thanks very much for accepting the invitation, Nick.

**Nick:** Totally. It's good to be on here.

**Balint:** Yeah. As a little bit of a retrospective, I came across you in the book the *Traction* book by Gabriel Weinberg and Justin Mares. I think this is a really, really good book. I use it even in my daily work for my podcast.

**Nick:** Yeah, great.

**Balint:** And I talk about it to other start-up founders, I talk about that. And afterwards, we chatted on Twitter. So, it took some time to find an appropriate time-slot for doing the interview. But I'm glad you tolerated my persistence. I believe I have a good reason, however, for being persistent as you're very much involved in the hardware ecosystem and via your company, your present company and also your previous companies that we should talk about, and also because of your starting the San Francisco Hardware Startup Meetup. So, I say let's get right into the topics.

**Nick:** Cool.

**Balint:** So, to start with, hardware is challenging, very challenging mainly because of the manufacturing issues that people run into, hardware founders, be it a crowdfunded or not crowdfunded project that we see coming, that emerge. So, what are some manufacturing related issues that you see for hardware startups where they fail? Because this is how we see it, typically we pick up the signals, the negative signals in the media. The media loves negative stories. So, what kind of insights do you have on that?

**Nick:** Yeah, and I think that what's interesting is that a lot of hardware companies are actually not started by hardware people. Which is maybe like the first set of issues is people don't even know where to start. A lot of Kickstarter people who run that or are first-time hardware entrepreneurs, maybe it's more common to find people at least for me that were sort of web developers and were in the startup community who then were thinking about building hardware than it was to find someone who already knew

how to manufacture things and then who wanted to do a startup. I think that there is almost like a mentality difference that causes the first kind to exist. So, they don't even know. So, that's the first thing, it's just right in the start, it's harder because you don't know.

Even after that people think that you can have a sort of 3D printing and everything else that is kind of prototype. And then they think, "Ok, cool." And then it will be, "I'll be able to make it cheap because I think that their products in the store that I see are similar or are about the same cost." And you're not the same buying power as say Apple or Walmart. So, people don't do it early. So, I think some of the biggest mistakes are actually not working with the manufacturer from the very beginning.

If I was going to do a hardware project today, I would start thinking about the general like sort of design that we're going to do and then I would start talking to factories that could execute on it because that's really where you can think about all those costs tradeoffs. Like every product, especially in competitive spaces, are extremely complicated. There's lots of risk all over it and engineering is how you kind of reconcile what your ultimate performance needs are with what reality is, with how to produce it, how much it costs and everything.

So, working with manufacturers really early to understand how the thing that we are going to work, how big it is, the size, materials, all of that eliminates a lot of problems. Sometimes you'll pick that they want something made out of say wood and they don't realize all the problems and expense that comes in making a consumer product out of wood, or choose a chip that's too expensive or has too much power consumption, there's all these things that can get you early on because it's so complex. So, I would say start with the manufacturer as soon as possible is like probably the biggest thing I would tell people.

**Balint:** So, once you get some kind of positive feedback from the market, you should start as early as possible, right?

**Nick:** Well, I would say that before you even get feedback from the market. So, maybe you can do like put up a homepage or these other kind of like very early things. But if you do a Kickstarter, I would have the design relatively fleshed out and the pricing known because they're going to have a bunch of disappointed people if you don't start with that first. A lot of people do a Kickstarter not knowing actually exactly how the product will be and be costed, and then they end up losing a bunch of money or failing or something like that. So, even before you do a Kickstarter.

But, yeah, there are other kinds of market validation that you should definitely do. But this is one of the problems with startups. It's that in hardware, or say, in software, you can iterate very quickly with most of the customers and everything else. You don't get

as much of that in hardware. Like, your prototyping phase is the iteration area and then once it's locked down as a manufactured product, then you're screwed with up-dating it. You have to do everything all over again pretty much to make a new version.

So, a lot of these things can be eliminated in the beginning by having lots of proto-types and test runs, which you can make at less cost upfront than it would be in pro-duction but you need upfront money at that point. So, if you don't have any money, how do you figure that out? When a Kickstarter, you can make a product prototype for a little money, make it, put a Kickstarter up and then do it. But, hopefully, you've already talked to manufacturers about how to make it, so if your Kickstarter does work and you do have that market demand that you'll actually be able to deliver on your promises.

**Balint:** Yeah, we discussed some about this topic with Sandy Diao from Indiegogo in one of the episodes and she said also that they, for example, offer this and also I think Kickstarter recently, I discussed this topic with Scott Miller from Dragon Innova-tion that they offered this together in partnership with other third party providers, cer-tificate providers, that they have a check on you, on your process if you are well-aligned from the manufacturing point of view.

**Nick:** Yeah, I think it's very smart. I mean, I know that for many years they've been trying to do this behind the scenes. I'm glad they launched like a full project.

**Balint:** Yeah. Yeah. So, let me now a little bit change the topic to your company Plethora.

**Nick:** Sure.

**Balint:** Can you describe it what you do and what your motivation was for founding it, and what kind of pain points you're addressing?

**Nick:** Yeah. I think there are kind of two pain points and also two stories for Plethora. So, where I come from, I come from the Rust Belt in Pittsburgh, Pennsylvania. So, I grew up in a bunch of factories and my family was in it. So, that's how I kind of came to manufacturing. But at the same time, I grew up being kind of a futurist and being really into like what's the future of society and technology. And so, those are kind of the two themes of like my entire life. So, all the companies I did before, including Plethora, are building on that and I would say that the long-term vision of Plethora is how do you make the entire process, an idea in your brain to producing a physical product that scale easier? So, if you were God and you have infinite super powers of creation, what would it look like to create? And then what's it look like now and then how can we draw a line between those two and get you as close to that Godlike state

as possible? That's really what I want to do it at Plethora. That's the super long-term goal.

The short-term goal is it's still too damn hard to make stuff, even very simple things. And so, at my previous company I connected a bunch of manufacturers together and I made this like automated quoting system that was Cloud Fab. And we found that like that does make it easier to use, just like being on the Internet. All the normal e-commerce things make it a lot easier. But what I learned is that one of the biggest problems with manufacturing or actually manufacturers themselves and the factory is actually where most of the problems are. And so, why does something take a week when the actual time it takes on the machine is a few minutes? Well, the short answer is the people have to set everything up and there's lots of sloppiness.

So, I said that with Plethora I'm going to open my own factory to produce prototypes for people and then at scale later on and I'm going to make a new kind of factory that basically instead of humans programming the machines, it's going to be the machines automatically programming themselves. And that's the big innovation Plethora has that sort of no one else is working on is how do you take all these traditional processes, so we started with CNC machining processes, and how do you make them very rapid to reconfigure and very cheap to reconfigure so people can just push a button and the parts come out? Just like an on-demand service or a pizza shop. I want to make a creation like pizza delivery.

**Balint:** So, you probably benefit from the vicinity of the software engineers in Silicon Valley because you mentioned that you're very much a software-powered manufacturing company, your technology, right?

**Nick:** Totally, yeah. For sure. I mean, I moved out here from Pittsburgh maybe five or six years ago and it was really for two reasons. Like one, I think the community just believes in big ambitious ideas more than any other that I found. And so, both… Like you're saying, software engineers get excited about a big idea and so do investors. So, to make a proper technology company you need the people who can actually make technology and then you need money so you can pay them. And so, yeah, that's why San Francisco. And then, also because there are so many hardware start-ups and other hardware labs, corporate labs here that it's also a great customer base. So, people say that maybe it's kind of crazy to have a factory in San Francisco but it's actually great. The actual expense of the land isn't that different. Actually, it doesn't make our price any different.

**Balint:** And what about competitors? So, when you started out, did you have competitors and how did you identify a gap on the market? You talked a little bit about it that you saw some pain points because of your background working with Cloud Fab and growing up in the Rust Belt, you said, in Pittsburgh area. So, you were immersed

in that environment, so you were aware of the problems but did you even have like an aha moment?

**Nick:** Well, I think that the manufacturing industry is a pretty old one. And so, there are tons of competitors. If you think of competition, it's anyone who could sell the same part to my customer. In the United States there are something like 13000 or even more individual machine shops in just the United States.

In that way, there are a lot of individual companies. But most of them are pretty local, so they have a small number of customers in their local market. And then there are a couple of national ones who are the biggest ones so we thought those are who we're going to be selling against. But as far as people moving fast with the kind of technology that we have they don't really exist but certainly we sell against other companies who are like tech enabled, like startups that also can sell the same parts. It's just that it's a very different approach that we're taking in a very different end game that we're looking at.

**Balint:** And what about competitors who have a similar business model and who have similar features? Because you do have a very short delivery time that you even guarantee and that also you have instant pricing, nearly instant, and designed feedback. So looking at these or a subset of these features, are there some competitors or were there some competitors at the beginning when you started out?

**Nick:** So, the largest company in our space is a company called Proto Labs. So, they're like a public company. And so, they were the only one that people talked about and really when we sell against people right now, that's really the main person who would come up would be Proto Labs. And they have sort of a front-end system that in a couple of hours can give you feedback and a price. And then, they have this back-end factor that produces the stuff. And so, when we think about Proto Labs like for me personally like I think that they were very prescient company, like they were very forward thinking. Whereas, Lucas, the founder, something like 12 years ago I think he had a great idea and I think that Plethora sees ourselves as kind of expanding on this idea.

So we said, "Okay, what if it was instantaneous feedback? What if that feedback was a lot more…" I would say the Proto Labs's feedback is kind of very general, while the Plethora one is… I will say, "OK, this hole isn't possible, you need to exactly make it this big for it to be possible." It's very specific feedback and it's instant. And it's specific to our machine shops, so there have been kind of standalone manufacturability tools for, I don't know, maybe a decade or so, but the issue is that manufacturer ability is very much supplier dependent. So, if you're working with one supplier, they don't have the same machines and tooling that another does, so it doesn't really matter if say Solidworks has some built-in DfM tools. You have to know everything.

And so, Plethora, our approach is very vertical. So, we've said every drill bit and cutter and all the tooling and the machines, all of that is known inside our software. And so, when you click analyze in our software, it instantly tells you exactly what's possible. So, if you have a hole and that hole is not a standard size and we can't bore it with an endnote, then we will tell you it's going to take an extra couple of days to order that cutting tool for you. So, you know exactly what the real possibility is. And so this kind of ease of use has never been possible or isn't possible any in other shop in the world.

**Balint:** And this kind of answer, lands itself to a kind of a follow-up question, which is that how is your business model or your business scalable? So, you said that it's very supply or machine dependent the way you operate. So, this means that you now offer it for CNC machining and I saw that you have it for turning, at least with the beta version available. So, how do you want to scale the business in case there's a higher demand?

**Nick:** Higher demand for those services, you mean?

**Balint:**  For your services.

**Nick:** Yeah, I mean it's pretty straightforward. I mean this is actually what we're doing now is we're in our growth phase and so we've been just hiring a bunch of people and getting a bunch of machines and building out like systems to make it. So, at scale you can do this because every time you jumped scale you get a different set of problems for scaling. And so, the scalability is pretty straightforward like I can get new machines on the floor from nothing in a couple of weeks. So, you have a relationship and you just kind of plan things out. And so, it just happens. And then, we are doing some stuff throughout that is sort of scaling that process so that we can scale the scaling itself.

But, yeah, it's the difference between that and working with existing shops is that you can control everything you do in-house where other shops the experience isn't as good. I was watching… I don't know if you've seen the… What is it, the Ray Kroc movie, about the guy who started McDonald's, the franchise. And then, in the very beginning they had franchises but they weren't really strict about it. And so, everyone all sorts of stuff and they weren't profitable and everything else because the average business owner isn't very good. And they don't have the processes to make it good.

And so, my thought is that by making a better system and allowing local people to run those systems that you're going to have a better output than the local entrepreneur is trying to start it and can fit it into your system because it's so specific of how we do things. And because we run like semi-automated factory, the process has to be quite controlled and a lot of local people and especially machinists who know a

lot about these machines can take shortcuts, which end up producing bad products or breaking things or something like that.

**Balint:** So you're not really thinking about at least right now in a kind of a licensing model? So, giving the technology and also the know-how, the process, to the local shops, as you said it, because right now is too complicated, but maybe even with time when it gets more automated because you have more know-how, perhaps it could be possible, but right now you're not thinking about it.

**Nick:** So, I think that the ways we look at this, like we think that pun-intended, run of the mill manufacturing services that are like you put a file and the part comes out, there's no co-engineering, we think that ends up kind of coming under like only a few roofs of companies and that the local shops will actually end up specializing in, which is already happening, but specializing in more and more niche markets. So, you see the emergence of people who just do, say, Inconal machining and they're very good at Inconal now and our automated processes won't even work on the kinds of things they're doing because it requires like a human touch and you actually are co-developing, say a turbine powers or some very specific thing and you have the specific test equipment and all of this, so those local manufacturers are getting more specialized and have more specialized services because there's already pressure from China.

If you're doing commodity machining or commodity anything, Chinese people can undercut you. So, all the smart local guys have figured out either how to have a cool relationship with people where they're actually adding value or are adding some kind of specialized value with their engineering. They're not just trying to directly compete with us. They are really not going to be able to even use our services to do that. The other way or like big companies that want some specific version of what we do. And in that case, like we're open to people doing that, we worked deals like that before. But it's not like our focus.

**Balint:** I mentioned at the beginning that you were one of the people or you were the sole person who set up the Hardware Startup Meetup. And how was that experience, so at the beginnings of setting up that meetup? And what are some of the lessons learned from there, again, that maybe even connected with your current initiative?

**Nick:** Yes, sure. So, you mentioned Justin Mares who wrote the *Traction* book and so Justin used to be my intern at Cloud Fab. And he ended up running a lot of the business actually after a while. So, we both moved to San Francisco together. Funny enough, and he is still a really good friend of mine. And when we first met, when we first moved here we were like, "OK, there must be a meetup for hardware in San Francisco, we'll just find it."

And then, after like a month of looking we're like, "OK, apparently it doesn't exist. We're just going to start our own." And so, our kind of growthhack on that was to just get Tech Shop to let us use their space and their mailing list to send this thing out. And so, we had maybe probably 500 to 1000 e-mails from Tech Shop and that really kickstarted the meetup itself. And I think that the core thing was also like inviting people that were like just extreme enthusiasts and partly it was self-selection.

Like at the time, no one cared about hardware and you couldn't get any money for it. So, anyone who would come to a hardware meetup and try to do a hardware company are the most hardcore enthusiasts. So, I think that like, for instance, I got at our first meetup Eric from Pebble before they even launched was talking and it was still called Get Impulse or something. And we had like what was it, Fitbit and anyway, people like this were coming because of the so early and it was crazy and so now, these guys that have had their rise and falls and everything else. But the community's grown huge since, I don't know, what was it 2009 or 2011 or something like that.

So, yeah, and you could feel that there was something going on. Like I detected that startups and the maker movement would collide because that was like my trajectory. Like I started the hacker space in Pittsburgh with Matt Stultz, called HackPittsburgh and I detected that like some people wanted to do startups. And then my friend Bre and Zach and Adam they started MakerBot and then you could feel that like the maker movement wanted to do this and there were some earlier investments in it. And so, I wanted to have something differentiated from the more hobbyist aspect of makers but also something that was… Like it wasn't quite startup's either. Like it was but we were different people who had different needs.

And so then, one of the early things we did after the meetup was really starting to grow and it just took off really. I mean we had maybe a thousand or so members after a few months and I think that's because we just tapped into something that already existed. And so then, I did a couple of things to organize the community like I built the hardware startup Reddit, which is still around and has about 12000 subscribers. And then, I ran an unconference. So, a hardware unconference, which was basically you run an unconference when you don't know what's going on in a space, you just know something's going on and so you invite a bunch of people who are the core people and you say, "What's going on?" and they pick the topics. And then you assign them into rooms and then you talk about stuff. So, it's like you make the schedule on the day of, at the beginning.

And so, from there we understood a couple of the big gaps, not just… Manufacturing of course was well-known, finding a manufacturer, evaluating manufacturers, things about working with locals, things like picking a design firm or all of these things. So, we ended up making a thing called the makermap.com and that's still a lot. And it's

like a registry of manufacturers everywhere and like designers and everything else. So, anyway that was kind of the early period was really building out the infrastructure for that community, and I still host those meetups today and the Reddit's still going, I run a hardware newsletter now that's called Industrial Evolution and that's basically about specifics on the manufacturing industry of what you call… But it's called Industrial Evolution because we're literally looking at the evolution of the industry or how we produce stuff. And so we have a ton of content we put in there that I would say is like probably like that core of the future manufacturing is in there every week.

And really, I think it's like being valuable to other people, like serving the community. Like I made this hardware meetup to bring people together and it's mainly a networking event. And the reason that I have the format is basically two-minutes lightning pitches and everyone basically gets to hear what everyone else is doing and then after like 40 minutes of that, then everyone gets to drink beer and enjoy each other's company and meet new people, and I think that's how you get these connections so it really acted I think as a catalyst for the community and people would tell me, "Throughout that I find my co-founder here, I met my investors here." That kind of thing. So I was excited to build that community. And I think that you help yourself by helping others. It's actually a nice fact of the universe that that actually works.

**Balint:** Yeah. Very, very, very exciting. And what is the current standing now? So, regarding the numbers, like numbers of the membership for the meetup?

**Nick:** It's nearly 7000 people in San Francisco.

**Balint:** Wow. That sounds very good.

**Nick:** Yeah, I know, it's great. We sell out within a few hours. So, it's crazy. And, really, I wish I had more time to do even more of it. It's like Plethora takes all my time. But there are other people, I mean there's probably five of them in the Bay Area of various sizes from the East Bay, there's in Stanford one, there is in San Jose one. And then, I think last I looked there were about 60, I think it's 60, hardware meetups around the world.

**Balint:** Before we move on to the last section, which is going to be four questions that I would ask, I have two topics that or two ideas that I wanted to address. One is what is your biggest challenge now, the single biggest challenge? I love the idea of focusing. How would you describe it?

**Nick:** Yes, sure. I mean, I think that for us at Plethora and that is what I think about most of the time, it's just scaling. It's right now we've had a ton of interest in our stuff with a ton of demand and it's just keeping up with it. I think that's everyone's challenge is after people like your product and it works. In a hardware company, it's peo-

ple who plan on manufacturing a small amount and then have a big amount which was our…  We grew faster than our plan would have indicated which is great but it leads to other problems, but yeah, that's our main thing is just what is the fastest you can scale supply is like a big thing for us and we're very close to sort of what I call like an escape velocity, meaning that like the capacity grows or the supply grows faster than demand is growing and then that means the businesses is doing amazingly, right? So, we have our work cut out for us but luckily it's an easier challenge than actually getting people to like it.

**Balint:** Yes. So, I was not so wrong with addressing this issue or bringing up this issue before earlier on when I started talking about scaling?

**Nick:** Sure.

**Balint:** And the last question before the four ultrafast round questions, mistakes. I think we are good at making mistakes. And I think it's a good thing because we learn from it. What kind of mistakes would you highlight that you made along the way?

**Nick:** Sure, yeah, plenty. I think there are so many different ones. I think that we had a couple of things. I think that maybe number one thing that I would do differently is I would have hired more of a management team earlier on. It was me and my co-founder Jeremy until we were like 20 people and at that point it was like too difficult to manage and we had to bring people in and I think we probably would have grown even faster and had an even faster kind of like team growth later but we would have had other people to help us.

Because now that we do have a full executive team it's awesome and it makes my life a lot easier and the company's life easier, and all the employees' lives easier. So, that's awesome and really like it's amazing how much…  I never ran a company this big before, we are about more than 60 people right now. And we…You have different problems when you grow and I think that it becomes that the CEO, meaning people at my job end up having to think a lot about people in organizational systems and goals and metrics and the stuff that maybe is like a stereotype of business people becomes your life.

And so, for me I really enjoy that stuff. But it's been a big learning experience, so I think that not just hiring the people but also like culture and making sure that you have your sort of people operations really tight, like have a person who is the head of people at your company early on, like maybe like within the first 10 employees and that person can help you not just recruit. I might even have them in the first five people just to make sure that like I can recruit fast and that the team dynamics are going well. And think of it almost like a sports team with a coach or something, like you are going to try to be as high performance as possible and you have to like…

A startup's job is to look at the environment, understand what's going on and then react to it. And there's a thing in strategy that comes from the Air Force, U.S. Air Force, John Boyd specifically, who's talked about what's called the OODA loop which is O-O-D-A – observe, orient, decide, act. And the idea is when you're in competition with someone that you want that loop which is continuous to be faster on your side than theirs because while they're still deciding, you've already acted and then you kind of eat their lunch. And the thing that does that is organizational efficiency and sort of culture. And so, how to do that is by really in your company thinking about how to empower people via systems and just how you goal them and their happiness such that you guys are like a special operations team and you're really able to go after your target goals.

In the beginning, I don't think I was as hardcore on that stuff as I should have been. That's probably one of the biggest set of mistakes is actually around management of people than it was around much else. I think that our vision has not changed since the very beginning, how we're pursuing it has not changed, even though there's tons of little technical decisions that we do differently. But all of that has worked out well and so is the team. But I think that if I were talking with someone about you really want to build a high-functioning, scalable, successful business, you have to be very focused on how the org actually works and the people inside it.

**Balint:** Yeah, I think it's very important because you have to work as a team and not as individual contributors but as a team because then that is how you build the company. It's important to focus on that.

**Nick:** Totally.

**Balint:** Yeah. So, going back to the interview. So, now we came to the ultrafast round of questions. So, again just to summarize very quickly, I would ask four questions and it'd be great to get relatively short answers.

**Nick:** OK.

**Balint:** So, the first question, if you could go back in time, like in *Back to the Future* movie, which I really like, to the time when you were in your 20s, what notes would you take back from now to give it to yourself?

**Nick:** It's a hard question. I mean, I think that the number one thing is I mean if I could go back, I would probably have moved to San Francisco earlier. I would have probably either dropped out of college or I would have like completely reengineered my degree, and then I'd probably had done something similar with high school. I think basically like this sooner I can get in the mode that I am now, the happier I would be.

**Balint:** All right. So you're a self-starter and a learner.

**Nick:** Yeah, I never really liked school my entire life, even though I love learning. And that was what always killed me. I was like, "Oh, man, school sucks like all the time." And I thought college would be real and I was like, "Oh, college sucks, too." So, yeah, I was never a big fan of it.

**Balint:** If you had to name a book, which one had the biggest impact on your career?

**Nick:** I think that it would be Neil Gershenfeld's *Fab*. That book was written in 2005 and it was actually before the maker movement. I remember someone gave this to me in college, it was like the one thing college did, that and financial accounting, those are the two things I use from college. And in the book Neil Gershenfeld who is like the head of the center of Bits and Atoms in MIT talked about this like kind of crazy future digital world. That was the first I've ever heard about what would become the maker movement, which at the time were Fab labs and then also digital manufacturing because I pretty much only did manufacturing using very traditional processes, nothing computerized. And it was then that I got super excited about everything that I work on right now. So I think that is the book that probably is like the biggest thing and maybe I would have discovered it some other way but it was what got me interested very early yeah.

**Balint:** Very cool. I'll look it up and I will put it into the show notes, of course. The third question. I'm amazed by habits and how these can have a positive impact on us. Do you have some routine, work routine or in your personal life?

**Nick:** Oh, man for sure. I'm actually very routinized. So I pretty much I get pretty early and I go to a coffee shop at 7:00 AM and I check all my emails until 9:00. I am basically getting all the main stuff, planning the day. That's like one of the biggest rituals I have. And then, sometimes I'll even leave work at 5 and I would go away to like a co-working space and work until 7:00 or 8:00 and that'll be the end of emails and work. So like I'm pretty introverted and I am pretty ADD, I get distracted easily, so I have to make a structured environment for myself, I just know that.

Other things that I use FollowUpThen, the email service which basically you can BCC… It's like Boomerang, you can use Boomerang, it's probably similar. You can BCC like one day at followupthen.com and then it'll ping you one day to see if you did it. So, a lot of my meetings are not just calendared but I also have email followups to all my direct reports, all the deals I'm doing. And so, it's a really easy way of keeping that going. So, I'll answer all that stuff in the morning.

Another thing that I do is I have a weekly staff meeting with all my direct reports altogether and we look at our metrics and our strategy and all of that stuff together and I think it's a good cadence to get in. And then, monthly I have an all-hands with the entire company where we go over similar stuff. And I think those are like kind of my

main… I'm not sure these are habits, but also rituals and systems for keeping it together.

**Balint:** Yeah. This is coming probably from manufacturing where you also have very a well-structured approach.

**Nick:** Yeah, you have to be structured, it's true. And I think I just like the early morning, too and I just like I do it on the weekends, too. Like, I basically do the same thing every day.

**Balint:** Yeah. Cool. The forth question. In your work, because I guess you do interact with people from different cultures, you have a team of 60 people, which critical cultural issues would you highlight that you overcame?

**Nick:** Sure. I think the biggest thing in Plethora that we have to work on is the relationship between the people who work in the factory and everyone who works in the office from engineering, sales, and everything else, and especially engineering because they're kind of like headphones on, don't get to talk to a lot of people, the people on the floor can't leave, they're in front of machines and computers doing their work. So, it's something that we've had to deliberately like really push and it's getting people to mix, it's keeping both teams in form and having members of both teams exchange, it's having happy hours. That's been the biggest thing we had to work on in culture is really making sure that we have a value of one culture. And so, we want to maintain that there are not two cultures, there is no laborer versus management kind of thing going on which is the traditional hard manufacturing thing. And of course, everyone gets the same benefits and everything else, so just making sure that it's very egalitarian. It's been a challenge but it's worth it.

**Balint:** Yeah. I've read the book about the biography of Elon Musk and they were talking about it that at SpaceX they have the designers on the shop floor. I mean really on the shop floor or just next to them. Because this is one of the critical ways to have a relatively smooth DFM design for manufacturing process. So, you minimize issues if the two parties communicate.

**Nick:** Yeah, that's interesting. I was over at the SpaceX Rocket Assembly several months ago. Well, it's an impressive thing and, yeah, I do remember seeing that now that I remember.

**Balint:** Nice. Interesting. So I loved talking about all of these topics. I think we covered quite a lot of topics. I need the time to process all this information, I think. Maybe the listeners as well. So, I encourage you, the listeners, to listen to it again. So, what is the best way to reach you, Nick, for the listeners especially, on social media or email?

**Nick:** Yeah, I mean I think that my email and everything is all the same. It's all just Nick Pinkston. So it's either nickpinkston@gmail.com, it's @NickPinkston on Twitter. Those are probably the easiest ways to have a conversation.

**Balint:** All right. I will put it into the show notes again. So, I really appreciate it, Nick, I had a good time. Thank you very much and I wish you all the best for the future of Plethora, digital manufacturing.

**Nick:** Yeah. Awesome. Thank you.

**Balint:** Thank you.

**Nick:** Yeah. Thanks for having me on. I enjoyed it, too.