Podcast Episode #67 – How to speed up your New Product Introduction - Production Line Tool, with Pete Staples of Blue Clover Devices, USA

RAW TRANSCRIPT OF INTERVIEW

Balint: Welcome to the show, Pete.

Pete: Thank you, Balint. Thanks for having me.

Balint: We got connected via a recent podcast guest of mine Michael of Duro Labs from L.A. whose team has built a tool for data management for developing hardware products so that you can get out of the chaos of handling e-mail communications typically that the teams do during product development. And you're also deeply connected to the hardware ecosystem helping companies of different sizes in their developments. So I'm very excited to talk to you.

Pete: Thank you, Balint. I'm happy to be here and yeah, I thank Michael Corr for putting us together. He and I were on a panel last year that was HARDWARECON in the Bay Area and then we hit it off really well. So I went down to L.A. to see what he was working on and we've kept in touch since then.

Balint: Excellent. I think that conference must have been last year in October.

Pete: It was last year. I think it was earlier in the year.

Balint: Okay, okay. Good. I also wanted to go to that one. Maybe it was even twice. I'm not sure but for the second part of the year I was invited but I couldn't make it. Hopefully, another time. I think it's a great event. I hear good things about it.

Pete: Yeah, that was my first time to participate and I enjoyed it a lot.

Balint: Yeah. To start with this interview, can you tell us about your company Blue Clover Devices? I'm not sure I pronounce it correctly. You can correct me there perhaps. What kind of problems you're trying to solve and what have been some of your most remarkable clients?

Pete: Sure, it is correct. It's Blue Clover Devices and we adopted that name in the early days before we really knew what our business was going to be about. So you could call it a working title and now it's endured all these years that we accept it. And what we do is provide development, design and manufacturing services to a small

number of clients. And then recently, actually just this month, we started to sell tools to a large number of clients. So it's an expansion of our business model. We have software and sales teams here in San Francisco and a hardware-oriented team and in-house factory in Shenzhen and we all work together to help clients launch their hardware products faster.

Balint: Yeah. I'm really interested in hearing more about it because there are a couple of design houses and companies that deal with our mass manufacturing including having some operations in China. So I'm excited to learn more. We had actually some discussion beforehand that of course I've studied your website and I think you have some unique points. I think it'd be good to point it out. For example, the ODM aspect in the IoT.

Pete: Yeah. I think our structure is somewhat unique and we do encounter a lot of other companies that are in overlapping and adjacent fields and we don't really view them as competitors. Fortunately, hardware is difficult enough that there's a lot of work to go around for everybody. So we all stay pretty busy and just try to keep improving how we do our jobs. But having design and manufacturing under one roof is a bit of a differentiation for a company our size to pull together these teams from both continents and actually function together on a single project or for single clients.

You asked about clients. I guess the most well-known of among them would Tesla be and Volkswagen and Audi. And then one that's well-known here in San Francisco in the micro transportation space is Scoot which has a scooters-on-demand type of service. And we also have a lot of niche clients that are in other industries. For example, right now we have some really sharp folks from Halter working in our factory in Shenzhen and Halter is a company making hardware for dairy cows in New Zealand. So the hardware helps the farmers move the herd around and they can detect cows that are in heat. And so that's quite a departure from some of the other clients that we work with.

Balint: I briefly referred to this terminology ODM. Can you explain that to us? Because I think some of the listeners are not so familiar with that.

Pete: Yeah and that's completely understandable because it is an industry term and it gets abused a lot anyway. So it stands for original design manufacture and that still doesn't help very much, I guess. But the way I define it is a company that manufactures products for other companies and also has design expertise in-house and that is what makes it different from the CM, or a Contract Manufacturer, that produces to a design spec that's 100% provided by the clients. So a pure CM model that'd be a lot easier. There are a lot of days I wish that was our business model but most of the clients that have come through our door wanted some help either in prototyping or design services or even custom firmware along with the mass production.

Balint: On your web page you emphasize the IoT aspect. Can you elaborate on that?

Pete: Yeah. Since we're in a variety of industries typically in ODM we'll just pick one type of product and just really focus on making microwave ovens or laptops or just one category. And we've never successfully done that, just we get pulled in two different directions by different clients and so we decided to kind of embrace that and just look for what they do share in common which is that they're all connected devices and there's a surprising amount of overlap between devices in totally different industries but sharing technology. And so that's how we came up with that tagline.

Balint: All right. And because you're in both disciplines, both areas - design and manufacturing. At the beginning of this interview you mentioned that you're coming out with a product for hardware companies, especially for the production, for manufacturing. Can you tell us you know moving on to this application, to this new product field talking about this, can you tell us typically what kind of tasks are carried out along the production line? And where do you see there is waste where there can be some optimization where your product comes in?

Pete: Yeah. Eliminating waste is actually in our mission statement. And so we're sensitive to it and there is a lot of it despite all of our advances in technology and production techniques are still just a lot of waste that doesn't seem to go away. On the line itself one of the blessings of being a manufacturer is you do get an intimate exposure to how the physical product is being made. And when we started working for Volkswagen many years ago, they introduced a concept to us called FMEA, which is failure modes and effects analysis. It's widely used but we'd never heard of it until they showed it to us and it's basically a one-page summary of the risk areas of the product. You're trying to anticipate what can go wrong with it, what's most likely to cause a return and it includes as a scoring methodology so that you can highlight the biggest risks. They score across severity, likelihood and lack of detective ability. So in other words, the worst thing you could have is a defect that’s severe highly likely and nearly impossible to detect and production.

And you can go overboard with the concept but I think the production line should address that assessment and dynamically reduce those risks so that you change your tests and your assembly procedures to make the product less risky or make it better. And the means of defining what the line does is really just these one-page instruction sheets in most of the factories I've been in and ours included and factories call them work instructions, or WIs, or we call them as SOPs for standard operating procedures and it's designed so that the operator on the line can learn the procedure quickly and execute it consistently. You have to be consistent. I mean no one would buy a car if they'd looked at one car and there's a big gap in the door and then the one next to it

is A-model and the windshield is a little up alignment line and you have to be consistent to build trust with the consumer or the user.

And we've had these procedures but I've long been frustrated by the practice of how they're created and how they're maintained and we always treated it as something that just takes a ton of discipline. So we add the SOP to our BOM, or the bill of materials, and we track it with version control just like we do the components. And many times, I've walked along the production line and asked the line manager why a worker didn't have the SOP in front of them. And I've even conspired with the workers and said [unintelligible] like “If you don't have the SOP, just don't work. Just put down your wrench.”

The line managers love it when I do that but it's very unpleasant to keep that updated and I blame that on how much detail we try to put into those procedures despite all my efforts. They're usually built in Excel with a lot of high-resolution photographs and clip art arrows and instructions in Chinese and now we make these bilingual, which makes them even harder to update. So they just become so complex that they get out of day quickly and then they become useless. And I think it's begging to be obsoleted but it endures because the only alternative seems to be automation so you don't need these procedures which is prohibitively expensive and then really hard to modify once you have it. So that's kind of a long story around why we arrived at this new product that we're coming out with.

Balint: Which is looking at this problem from a different angle because you're no longer like you want to handle so much the SOP, right, which you started to say but you're bringing the automation.

Pete: Right. So we want operators to have simpler procedures and allow whoever designed the product to be able to modify those procedures remotely and keep track of which procedures are used on which units on the line. So we call it the PLT, or production line tool, and that's the means by which we automate but we do it in a way that's a lot more flexible than what we've seen before.

Balint: So how would you describe it more in detail this PLT and has there been anything around like that on the market?

Pete: Well, first what it is is a tool for loading firmware into the target hardware and running a bunch of tests on it. And our philosophy behind it is that the most critical aspect in production is getting clean data from these procedures. And so to do that we really try to take advantage of these precious moments when you're connected to the hardware. The reports from these activities run on the PLT the reports are made automatically so you can view them and filter them and search them from our portal. And it's also a much lower cost. I guess we'll talk about that later. But normally au-

tomation is brought in much later when products are already running into the millions of units a year. But the PLT is built so that you can use it in development and then keep using it in production.

Balint: Yeah. I think it's a it could be valuable for a lot of companies. You mentioned that some of your clients are like Tesla, Audi, Volkswagen and because of the lower cost and that it could be useful in development, and there are lot people in smaller startups developing products could be useful for a lot of folks.

Pete: Yeah, we think so. So I mean our previous model we can only handle a dozen clients. But the PLT is something that we think quite a few companies that are making hardware in a variety of industries can benefit from it and just move more quickly as a result.

Balint: And how did you run into this problem? Because you started describing that you were doing the FMEA with Volkswagen. Was there at a particular moment when you were like, “I need to have this PLT created.”?

Pete: Well, I have to tip my hat to the development team. So we just have clients and they ask us to implement the production of their products and we just started to get more requests to do more and more testing on every single unit. And it wasn't really feasible to just keep adding more and more workers to the line in the beginning of projects where you don't really know how many units you're going to ultimately produce. So it's hard to set up a big long complex line and then take it down a couple of weeks later and then set it up again to make another product.

So we kind of reached a breaking point and the development team just cooked up this box and said, “Hey with this we can develop the test plans and make sure that the firmware is loaded in a certain way and that the device IDs can be loaded in a certain way and we can do it from San Francisco without having to be there on site all the time in Shenzhen.” And so it was a way of building a bridge between our two teams that gave birth to this. And then over the last year we've been using it and we just saw more and more potential for it.

Balint: Would you say that the team can be basically anywhere in the world and if they have production sites in China, they don't have to travel so much to check on the process?

Pete: Absolutely. That's one of the shining benefits is it's kind of like a teleporter because you get a lot of the benefits that you would otherwise have to be there onsite to get and this way a customer is actually is able to realize an event where an operator is pushing a button and then they see the report instantly from their laptop and another… They could be at the beach or anywhere.

Balint: I think it's another level, a new level for remote work.

Pete: I hope so.

Balint: Yeah, for startups. They can really can be anywhere and then have the belly fracturing in China. There are quite a few companies that want to do that I guess because also if you to stay in China for a long time, the cost can add up or in case you have to go back and forth between your location and development in China, that can be an issue as well. So I think you're trying to solve an important problem as you said that the during the actual testing the testing used to be more expensive, right?

Pete: Yeah, we talked to a lot of companies about this before we invested as much as we have so far and the minimum we heard was two hundred thousand dollars to automate a line making electronic products. And we designed this so that whatever you're trying to do with that kind of money we can do that for a tenth of it. And it may not be as precise in certain tests or it may not be as fast as at a certain procedure but in total, we think that you're actually getting the data you need much faster than you would with even much more expensive system.

Balint: So you do get this 10x improvement. You know as they say in the famous book by Peter Thiel to *Zero to One*, he was describing that a new technology should introduce a 10x improvement. You're bringing a 10x improvement in the price so making it more affordable.

Pete: I guess the one tenth factor.

Balint: Yeah. What is actually the unit price? Because a 10x improvement would be roughly 20 k and so what would be the unit prices and how many units does a team need to install in a factory typically, depending I guess on the volume and the complexity of the device?

Pete: Yeah. There can be some variation by project but I can speak to what's typical. So the PLT itself is nineteen ninety-nine and it requires a cloud back and to support it and there are a few service tiers for that. The pilot tier is free, the economy class is one hundred dollars a month at the org level and that supports five users and up to five projects and that covers a lot of startups, and then business class is 500 a month for an organization and it jumps way up to 500 users and 500 projects. And we actually don't charge per user and Michael Corr was part of the inspiration for that because he developed Duro with the idea that you want a lot of users to benefit from that data and so per user fee can kind of throttle that back. And so we use the same approach. We decided not to do a per user fee.

Balint: And how many units do you have to place typically into your production line?

Pete: Five or six is what I would call typical. So the first PLT for a project normally goes to the development team where they can refine the firmware and design the tests and then maybe three more would go to production, the contract manufacturer or wherever the production side is. We would normally have one or two at ICT for [unintelligible] level testing and another one or two for finished goods testing and then maybe another one for a QC or something.

Balint: Okay. All right. And in which kind of verticals do they use? So I guess it's mostly IoT companies, right? In your case at least.

Pete: Yeah. It thrives when there are a lot of tests and we see most devices becoming IoT devices and most IoT devices becoming more and more complex with multiple radios and multiple microcontrollers inside them. And that's what this is built for is to handle that complexity and bring it all together into reports that are easier to process. And I guess transportation is an area we see quite a bit of potential. And we've happened to get clients in various transportation areas like Scoot was one of the early users of the PLT. And we're going to participate in the automotive test expo in Stuttgart in May. So that we're looking to expand in automotive and we also see a lot of potential in new types of aviation so electric aviation. And that's because they have a lot of test requirements too.

Balint: Yeah. And I think you know about that quite a bit because I know you like aviation.

Pete: I do and it's been great to see our company be able to play a role there.

Balint: Yeah. When is it going to become commercially available? Like not only for a smaller amount of customers but for the wider public.

Pete: Yeah. We just launched it and so it's available now and we're just in the process of promoting it and making people aware of it.

Balint: Yeah. Anything else you want to point out about this initiative?

Pete: Well, you asked how many PLTs might be used and we see them being sprinkled out to various locations and I guess I would want to emphasize that at each of these locations the benefits they can run the same exact test. And if you invest 200 K or 300 K in automation, then that one place is the only place you can run that kind of a test. And so that's a vulnerability for the brand holder if there's only that one-point failure, that could bring everything down.

Balint: All right. So you mean that this tool, your tool allows the teams to become less prone, so they could become more independent of the CM, of the contract manufacturer, or the production site?

Pete: I think it makes the team more resilient because if something happened in one location, it's easily replicable in another location.

Balint: OK. OK. I see. Do you see this really happening that for companies it can become useful?

Pete: Yeah, absolutely. We're betting on it.

Balint: Pretty good. So I'd say let's move on to the ultrafast round of questions.

Pete: Let's do it.

Balint: Alright. So I'm going to ask four questions and it'd be good to get relatively short answers.

Pete: OK.

Balint: All right. So the first one is if you could go back in time when you were in your 20s, what the notes would you give yourself?

Pete: You're going to find this to be an odd answer but I feel like I actually did get to go back and give myself advice when I was 20. So when I was a junior at Michigan I got pretty stressed out with my engineering workload and soccer practice and social stuff. And somehow this voice just came to me that told me I needed a change of scene and it led me to apply for an internship through IAESTE. I'm not sure if you've heard of that. It's a very long acronym for International Association for the Exchange of Students for Technical Experience.

Balint: I think I heard about it.

Pete: It's a great organization, long name though. I worked in Sweden and I lived in a dormitory and I met all these great students who are a lot like me but a little different. And as I got to know them, I discovered that some of them were twenty-six years old and hadn't even picked a major yet and I just thought, “Why am I so stressed out? Why am I in such a hurry to get everything done?” And seeing the way they lived really made it feel like this giant rock had been removed from my backpack and changed my life profoundly. I guess I'd just say like if you're young, you should really get a major change of scene multiple times if you can and especially if you feel stuck.

Balint: Or even if you're somewhat older like me because three years ago I did a world trip and it was life changing.

Pete: There you go. So I guess it is advice that you can use throughout.

Balint: Yeah. Excellent. The second question if you had to name a book or even two books or three books, which books had the biggest impact on your thinking, on your entrepreneurial thinking?

Pete: *Life as I Have Known It Has Been Finger Lickin' Good* by Colonel Harland Sanders.

Balint: Okay. Haven't heard this before.

Pete: It's not on every bookshelf, I don't think so, but here's a guy with a 6th grade education and he did all sorts of odd jobs throughout his life and opened a fried chicken restaurant on a shoestring when he was not 20 years old, not 30 years old, 65 years old and it became a global juggernaut that endures today. And I like this book because it's written in his own words so there's a lot of bad grammar and colorful expressions and I think it he has so many stories and it just shows the timelessness of how critical grit is to becoming an entrepreneur. And I guess in S.F. it's just sometimes it feels like we're surrounded by these teenage billionaire geniuses in fleece vests and designer jeans and I just find the colonel to be a nice counterpoint to that vibe.

Balint: I think you're referring to KFC, right?

Pete: Right.

Balint: Yeah, I know a little bit that… Just one story stuck in my mind is that he went around like knocking on two thousand doors so that he can open up his restaurant trying, trying and trying.

Pete: Yeah, he definitely put in a lot of effort and just had all kinds of hardships but he just kept bouncing back and so we enjoy his chicken today.

Balint: The third question. I'm amazed by habits and that they can have some positive effect on your life. They can create some nice routine in your life. Do you have some routine?

Pete: I do. I like weekly routines. And one of them was inspired by a client called Compology. And we were in a meeting at their office in San Francisco and the CTO said, "I'm sorry to cut this short but we need to get on to our next meeting." And we packed up and headed for the door and said our goodbyes and there was a group of employees gathered there and they're in there running shorts and shoes and as we walked out so did they and they went off and went jogging. And I asked him about it and he said, "Yeah, they have this little running club and they just go out and run around the city to stay fit." And that inspired me to create with our HR department the Beaver Fitness Club at our company and so we take some work time on Wednesday

here in S.F. and Thursday in Shenzhen and just do some fitness and I love it and I think it helps us on so many levels.

Balint: Yeah. I think it's important to sports especially if you're outside running you get some fresh air and that brings fresh ideas.

Pete: Yeah, totally agree.

Balint: Yeah. The fourth question. Because you really work in different countries in China in the U.S. and you have, I guess I mean based on the interview you have international clients. What kind of cultural differences have you seen that you could overcome?

Pete: Yeah, this is kind of a tricky question. And in listening to your podcast I notice most people probably wisely say, “Well, there are no important differences. We're one global village.” And everyone's saying the same on the important things. But I'll take the risk to answer with some specifics. So I had a hard time managing when I went to Shenzhen and there's language barrier but also cultural differences and I found that I was very consultative and asked for feedback a lot. And my partner there said, “Hey, you know people are going to think you're weak if you ask for this much feedback and you know you should be wise to that.” And over time I got to be a lot more forceful and give a lot more specific directions and over time our team actually did gel and our execution power just got to be incredible. And I was kind of electrified by what I saw. And later we opened the S.F. office and I hired my former office mate from Clemson and another classmate from business school. But I kind of kept my style and I got this huge backlash. And finally, my friend said, “Wow, you're totally this now a**hole and you never listen to what we say and don't really seem to care about our ideas.” And as he said that I thought to myself, “Yeah, I am. And it took me a long time to learn how to be this way.” I guess it was kind of reverse culture shock, some expats talk about that and I think that I have reached a bit of a balancing point but I still have to make an adjustment as I go through customs in Hong Kong and pay some attention to learn where I am.

Balint: Yeah. Interesting. Interesting story. Yeah, I guess you spent a lot of time then in China that you really could adjust to the climate there.

Pete: Yeah, I mostly live there. I've always had clients in California and reason to be in California multiple times in the year but I was probably 80 percent in Shenzhen for the first eight years or nine years or so.

Balint: So like 2003 to 2011, right?

Pete: Yeah.

Balint: All right. Interesting. So I guess we came to the end of the interview. Is there anything else you would like to share besides your e-mail or other contact information for the listeners so that they can reach you?

Pete: I'd like to share my gratitude to you for creating this awesome podcast.

Balint: Thank you. Thank you.

Pete: Before this I listened to many blazers for soccer and a podcast which is aviation week's podcast. And when I heard… I don't remember how I came across it but maybe from Michael Corr but I said, “There's really a podcast called The Hardware Entrepreneur? I can't believe this. This is so awesome.” Thanks for giving it life and making it a good place to be.

Balint: Thank you. I’ll keep on going then. Thanks a lot for the interview. I appreciate it. And again, what’s your contact details for the listeners

Pete: pete@bcdevices.com is the easiest way.

Balint: All right. I'll put it into the show notes along with the rest of the stuff that we discussed. Thanks a lot.