



Podcast Episode #27 – Rapid prototyping - a platform and its essential tools, with Finbarr Watterson of Fictiv, USA

RAW TRANSCRIPT OF INTERVIEW

Balint: It's amazing that I can get to talk to Fictiv, which is a pretty exciting startup for startups, especially for ones in the Bay Area in the U.S., but also interesting for other ones, other companies, startups in the U.S., and maybe soon outside the U.S. Welcome, Fin, to the podcast.

Finbarr: Thanks, Balint. It's great to be here.

Balint: We got connected on Twitter. We are checking out each other's tweets but also because before I read some of your blog posts on Fictiv, on the website, on hardware development, which are pretty exciting, like lean hardware development, just one example. I love the contents there. And Fin, just to start off with the first question. I think one question that immediately comes up is what is your role at Fictiv and how would you describe the company? What it does and what the vision and mission are which indicate quite a lot, tell quite a lot about the company what it wants to achieve?

Finbarr: Cool, yes. So I'll start off with the vision and mission because that says a lot about what I do in my role. So the Fictiv vision is to democratize hardware development for everyone, so make it easier to build hardware. And the mission is to empower people with the tools, information and community necessary to build amazing products.

My role is a hardware evangelist. No, it's not a religious role, but I spend a lot of the time meeting people in the hardware community to learn about some of the challenges they face and then bring other experts in from the community to educate others. And so, I do this through events, and webinars, and workshops, and an example of this is two weeks ago we did a webinar with the co-founder of Lockitron and there was an hour-long webinar where participants were able to ask questions. And one of the interesting things about Lockitron is that they went from a really, really high BOM kind and cost and they reduced the complexity internally truly thoughtful design for manufacturing features to get it done by two thirds. And then, next weekend we're going to Maker Faire in the Bay Area and we're partnering with Kickstarter to do a live engineering teardown about 3D Doodler pen.



So it's quite a wide range of content but it is really focused around providing content that helps people build better hardware. And a lot of people know us for content but our core business is actually 3D printing and CNC machining services. And our core services 3D printed parts in 24 hours and CNC machine parts in three days through a distributed manufacturing model.

Balint: Yeah. Yeah. You have an interesting role there. It reminds me your role of a Guy Kawasaki who is also an Apple evangelist. So it's an important role to push the company, to make it more well known in the field, in the industry. And the second comment I have is that I see a very interesting proposal, value proposition that you have, that you have both 3D printing, which is the additive manufacturing technology but also the subtractive one, which is the CNC machining, and both are used as tools for prototyping. Both are important. And I see that you offer quite a few materials and technologies, for example 3D printing, I saw it on your website, you have a very interesting kind of decision tree that you present there about the different materials. So if you need mechanical properties or mechanical stability, then you need a certain group of materials you can choose from, also depending on what kind of resolution you need. But if you need the flexibility or rigidity, then you need other kind of materials. So you definitely do interesting things and how you present it as well which part which is coming from you. Because this is your role, to create the contents, right?

Finbarr: Yeah, absolutely. I mean what we do when someone asks for a certain material or a certain process, we usually ask them what are they trying to achieve from this prototype. What is the problem that they're trying to solve? And so, we try to again educate people on the best way to solve their problem. So if they're looking for something that has a lot of heat tolerance, then we might offer a certain material like nylon. And if you want to test your prototype for strength, then we may recommend CNC machining, not plastic.

And so, it's not just about providing as many materials and services as possible, it's actually providing insights of why people should actually go for one material than another. And we have a chat icon everyone in our website, when you click on that, you're instantly talking to a mechanical engineer based at our office. And so, a lot of people just they spend their day talking to one of our MEs and learning what's the best way to actually fabricate their design to solve the problem that they're working on.

Balint: How did the company start out? How did it get to this point? It's relatively recent, to my understanding, to my knowledge, when the company started out. During the podcast I'm always interested in how people start out, how the company starts out because this is the real entrepreneurial part of the journey. Later, it's about you need professional management skills. And at the beginning, you need a different skill



set, which is about how to innovate. And so, how did the company start out? And who are the founders? And what was the MVP for the business? The minimum viable product or the prototype business, so that the founders knew that this is a business that could work out.

Finbarr: Yes. So it's a really fun story. So back in 2013, Neot and Dave Evans, two brothers, Neot was working as a startup advisor for a boutique investment banking firm. And Dave, his brother, he was working in Ford's, in innovation lab. He was their first hardware engineer and he was working on their dashboard infotainment systems for Ford cars. And he became frustrated when he was ordering parts that he would have to wait weeks and weeks to get the parts fabricated. And there was a lot of communication and quoting, and when he was ordering parts of machine shops, he would get completely different levels of service whether he was using a Stanford e-mail address, a Gmail email address or the Ford. And also the price was actually different in all three cases as well. Well, actually for the Gmail, they just didn't reply to him. But they thought there was a better way.

Balint: Crazy.

Finbarr: Yeah, it's crazy, it's crazy that that went on. So, he was speaking to his brother and they were talking about these frustrations and they looked for a better way. So the MVP was a maker bot replicator, they spent \$3000 on this. And they made a promise to each other that if they could pay for the printer in one month, then they would quit their jobs. So they went to Maker Faire and started handing out business cards and they started tapping into their network of engineers, and started fulfilling 3D printing orders in their kitchen and driving around town on a scooter delivering parts. And in one month they met their goal and they held each other to the promise and put in their notice.

Balint: That was still a pretty brave move in a way because they got the break-even point for at least getting back the investment that they put into the maker bot. But still it was not enough, of course, to make a living out of it. So they definitely, in my eyes, they made a jump and then they started, as you said, looking around more and more how they could expand as quickly as possible, right?

Finbarr: Absolutely. I think the key thing is they were able to prove that people would pay for this service as well. And so, by able to do that very early on it gave them a lot of confidence that there was a need out there, there was a market, they had proven that market, which allowed them to go forward.

Balint: Yes, so they did a validation.

Finbarr: Yes.



Balint: With the customers, potential customers. Yep. What would you say the essential element is or elements are for the business model? It's a very important aspect of a business.

Finbarr: Yes, absolutely. So we're actually a distributed model. So we don't own any of our own machines. And so, we've created a vetted vendor network of printers and machine shops that have way more years experience fabricating parts than we do. And so, we have our own team that is focused just on onboarding quality vendors and working with machine shops to ensure that our quality is met. And so, this allows us to see capacity into machine shops and printers. So typically machine shop might have their machines running only 70% of the time. And so, we can see that okay, there is 30% capacity here. And so, this also allows us to route their orders to these machine shops really, really fast. So, as I said, we can do 24 hours for 3D printing parts and three days for CNC.

And so, we take care of the whole ordering process. So it's very simple: you just upload a file and then the quote is done by us and then the part gets shipped or sent to a vendor, and then it comes back to our office. We do all of the quality control and then we take care of the logistics as well. And so, we have our own actual internal metric, it's called the OTIF, it's on-time-in-full report. And so, every morning we look at all the orders from the previous week and previous days and we have 95% score. And so, if we don't make 90% of our on-time-in-full report, then that's a loss for us. We have very high standards of what these parts should be delivered on. And a failure could be if 30 minutes later than when we said it would actually be there. So for the customer they don't actually know that it wasn't on-time-in-full, but we've really committed to focusing on the quality and the speed instead of owning machines and then having to recuperate costs from the machine, we are like focused on the actual experience of ordering parts.

Balint: So, yeah, this is like the Airbnb platform model that you follow and you're concentrating on the main point, the selling point, which is that you have this very fast delivery 24 hours for the 3D printing and three days for the CNC machine parts, right?

Finbarr: Absolutely. A lot of people compare us to Airbnb quite a lot. And so, just as property owners rent their spare rooms in Airbnb, shop owners lend their idle machinery to Fictiv. But most of the sale goes to the actual vendors, just as Airbnb gives most of the sales to his host. And just as Airbnb vets its host, we ensure that our partners meet the standards as well. And so, that gives us a lot of flexibility in there as well. So if you're on Airbnb, you can rent a couch but you can also rent an island. So we're trying to do the same. We are not tied to a specific process or specific material or specific machine. We can bring on a lot of different processes as well. So if



someone wants an exotic material of a crazy tight tolerance and then it needs to be sanded, we can do all of that because we're flexible with our network.

Balint: Yeah, it's great that you described it a bit more in detail and also drawing this analogy, this comparison to Airbnb because this is the main part, this is the core of the business model, as I see it.

Finbarr: Absolutely. We believe that we shouldn't own the machines, that there is already a really, really great machine shops and print farms and even just mom-and-pop shops out there that just do really high quality work. And we let them focus on making great parts and we focus on that whole ordering process. We try to like remove the complexity of the fabricating parts. So, as I said, it's a self-serve model. You don't have to speak to anyone if you don't want to, you can just drag it out through the process or even just get a quote. You don't have to send it out and wait a couple of days to get a call back. You can do all of that through the platform. But again, if you do need help, you can just click on the chat icon and be talking to an ME who will be more than happy to help you choose the right process.

Balint: That's a good point because some of the engineers are hesitating to talk to other people. So, you offer also this kind of opportunity that they can just send the file, they can go through, let's say the regular process, that they even send out probably an email as an answer as opposed to the chat. But, of course, the chat has the advantage that is just live and it's faster the communication.

Finbarr: Absolutely. We also do design for manufacturing feedback on the actual parts before you've ordered it. So when you upload a part, you will see how much it's going to cost and the different materials and different processes. But then you'll also see warning signs if you're doing a 3D printing process and your walls are too thin. This could be a problem. This might actually not print properly the way you wanted. Or if you're doing a CNC part and your internal corners are too sharp, we will be able to tell you that there automatically through our software.

And so, it's all about helping the user design better files as well and understand the process as well and the limitations. Every process, whether it's injection molding or silicon molding, they have the pros and cons and they have their limitations. And so, we're trying to educate people there on that that they can make the right decision. And maybe CNC isn't a good option for this part. Maybe you should just skip to silicon molding because if your end process isn't going to be CNC, then maybe you should look at different options.

Balint: Yeah. Who are your competitors?



Finbarr: So the big competitors for us would be Proto Labs or Plethora or Xometry. I guess the difference with us is that they own the machine. So it's in their interest to recuperate the cost back from their machines. And so that's where they have put their investment. And we've really put a lot of investment into that customer experience, into that ordering process, the design for manufacturing feedback and the customer service as well. That's where we've put our investment.

Balint: If we consider the business model that you work with, do you have competitors? Maybe not locally because right now you operate mainly in the Bay Area and in the U.S., but do you have even globally some people who... Maybe again, maybe we should not then say competitors because actually competition means that there are two companies, which compete for the same customer. And if there's another company, let's say in Asia, doing something similar with the same platform-based model, I would not call them competitors. Maybe later you can become competitors when you compete on a global market.

Finbarr: Yeah, absolutely. We're not the first to talk about this distributed model. It's been around for a while. And the biggest one I know of is that 3D Hubs in Europe. So they again, they don't have their own machines but they have a market place. The difference I guess with us and them is when you are trying to get a quote and you're trying to order, you start dealing directly with that printer. And so, your agreement is between you and the printer in that certain location. Whereas in Fictiv we really own the customer service, but also the quality and then the actual logistics of it as well. And so, because we own that, then we can have a very high standard and guarantee on speed and quality.

Balint: Regarding another aspect of the building of the company – financing. How did it happen? Because the way you described it, it sounded like you followed at the beginning a bootstrapped model, so you were using the customer, the income from the customers and you reinvested it into the company. But to grow faster, what kind of stages or what kind of steps did you have?

Finbarr: Yes. So I can only speak for the guys a little bit. But yeah, as I was saying in the early days, they bootstrapped, they put in five thousand dollars of their own money and then in 2014 they had a seed-funding round and then late 2015 they raised series A funding round and that was led from Accel.

Balint: Yeah. Startups make mistakes because again they have to make mistakes to move forward in an innovative way doing something new. So you will make mistakes by definition. What kind of mistakes do you think the founders made while building the company?



Finbarr: I think....I really need to get back to you on that one. I can't really speak exactly on what they did wrong. Probably a better question for them.

Balint: Or maybe after you joined the company. What kind of, then yourself, what kind of mistake you think you made which you learned from? We all learn from mistakes. So I look at mistakes as a positive thing. It's just a learning step.

Finbarr: Of course, of course. I think in the early days I was very enthusiastic about where Fictiv could go and I wanted to grow the community as quickly and as much as possible. And so, a lot of the programs and events that I was running, they were focused on very large-scale presentations and trying to get a lot of people in the room. But we realized we weren't really doing anything different and we weren't providing like a lot of value for people who came to a Fictiv event. And so, what we did then we started just going out and asking people what will make this better. A lot of it was just that the topics weren't in-depth enough, they weren't educational enough.

And so, we really reprogrammed the events to have a very narrow, narrow focus, very educational, on a much smaller audience so that the audience members could actually participate and ask their questions but also give some insights of their own. And it allowed for people within our community to have much deeper and stronger relationships. And so, at these events if you meet 10-15 people and you chat to them and exchange business cards, it's great. But it's very hard to remember each and every one of them conversations. But if you go to a smaller event that's more focused on something that you're interested in and you make one or two really good connections, then that's incredibly more valuable than the 10 or 15 business cards you've collected the day before.

Balint: Yeah, yeah. I also think it's important to create strong personal connections rather than just spreading thinly, in a thin way, in the sense that just collecting business cards.

Finbarr: Absolutely.

Balint: Yeah. Manufacturing. Manufacturing in the U.S. versus China. Which location do you think companies should choose in terms of manufacturing for prototyping step or for later? What kind of considerations, thoughts do you have on that?

Finbarr: Yes. So obviously it's a big topic. Fortunately, I've seen sort of both sides. I spent three years living in Shenzhen, China working for PCH, supply chain company and they had access program that allowed startups to come in and get access to the factories that they were working with for some of their bigger clients. And a lot of the startups they come in, but they had very, very small MOQs, minimum order quantities. And so, they were going to factories that had very large MOQs. And so, there



was a lot of pressure to produce a lot of products before they had actually sold them to the market.

And so, they would go to crowd funding and they would be trying to sell 50000 units. And so, there was just so much pressure. And then what we're seeing now is people are doing a lot smaller volumes but they're doing them in the U.S. because it's a lot more valuable for the company to go from say 10 units to 100 to 500 instead of going from 10 to 10000.

Reid Hoffman said that if you're not embarrassed by the first product you put out there, then you're doing something wrong. And if you're a hardware startup and you're going to Shenzhen and you're trying to do 10000 units, then you only get one chance and you're sending with that inventory as well if you only sell a hundred, and with no other steps to actually improve that product. But if you do some of the manufacturing in the U.S., then you can actually iterate more and you can actually get into different versions and simplify and reduce the complexity of your product as you go along. I still think when you're going for scale, then China is the only game in town. Unless you're in a different industry. But for this, I am talking about consumer electronics.

But I think it's much more beneficial to spend more time developing a smaller batch, getting them out onto customers hands or doing more user testing and learning more about what customers actually want. So I think one of the companies that we cite a lot is Lockitron, we did a webinar with them, it was really, really great. And their first product that they had on crowdfunding had like all these features and had Bluetooth and Wi-Fi and really, really high BOM cost and it was such a nightmare to manufacture. And after they did their first batch and after they spoke to customers, "What do you really want?" and the customers had given them feedback, it was just want something that works really, really well. So it would have been much more beneficial for them to actually learn that much earlier on, they could have done that with 50 or 100 units instead of trying to do 10000 early on.

Balint: The question now automatically comes up then, specifically, how do you bridge this gap between mass manufacturing in China which can happen in a lucky case if your company, if your product idea is good and it's validated on the market in a low quantity as you said it in the U.S., and also that you have this issue that you're doing the iteration on the prototype, you don't know or you might not know what kind of manufacturing equipment would be used in China. So are you in contact or do you know the equipment and the processes, the production lines that are used for manufacturing of those parts in a higher quantity?

Finbarr: Yes. So I think their factories in China have gotten a lot better of being able to communicate what their process is and actually helping companies understand



their process so that they can adapt to a China manufacturing line. I think maybe five, 10 years ago it was still a bit of a black hole. You needed a company, like a middle company, to actually answer a lot of them questions. But you can speak to a lot of these factories very easily and online and just learn about the equipment that they have and learn about their assembly line and the other products that they're working on.

And so, you can get a lot of them questions answered before you have to just maybe guess, there isn't any kind of guessing about the processes. You can just go and ask these days and even stuff like testing, an assembly line, design, that can all be done in hives in the US. You can design your whole assembly process before you go to China and you can bring that over and that's going to save a lot of time than if you're asking your factory in China to actually set up the assembly line or do the testing as well, and then you have all of that knowledge as well that's all built up internally. And so when you can learn as much as you can about manufacturing before you actually go there, then you can take your model and you can go to any supplier because it will just fit right in.

Balint: Do you have examples of companies, perhaps, which went through this going from prototyping to mass manufacturing like this?

Finbarr: Yes. I think again the first one comes to mind, just because it's been so recent, is Lockitron. And so, they set up their assembly line in their offices and they were able to bring that over to a factory in China to do this. And they have got like tons of information on their website and all of their Kickstarter updates... Sorry, it wasn't Kickstarter, it's crowdfunding, are on there. And so you can actually read about their process, they just like documented all of it and how they actually did it.

Balint: Yeah. Fin, I would now suggest that we step through the ultrafast round, the so-called ultrafast round, which means I would ask you four questions and it would be great to get a short answer.

Finbarr: Great. Sounds great.

Balint: The first one. If you could go back in time to the time when you were younger, maybe at the university, what notes, what kind of tips would you give yourself?

Finbarr: Good question. Not to do a degree in journalism. I graduated in Dublin, 2009, with a journalism degree. It wasn't the most in-demand skill at that time, but joking aside, from graduating through a rough recession there was a lot of fear of failure out there within society. And I think I would tell myself to be maybe less afraid of failure. And Silicon Valley is a great place where people are... There is no fear. It's good to fail. It's what you learn from that failure that's important.



Balint: Yeah. So you definitely learned from that and now you're in the right environment.

Finbarr: Absolutely.

Balint: The second question. Do you have one book, which had a big effect on your career?

Finbarr: Yes. So I think *The Power of Habit* by Charles Duhigg was really instrumental for goal setting and kind of tricking your mind into doing something that you may not want to do.

Balint: I need to take a look at it. I haven't read that book. The third question. What kind of habits do you have, power habit do you have in your daily life?

Finbarr: Yes. So, at the moment I'm in the middle for training for my second full Ironman triathlon. So a lot of my free time is taken up by training for it. But it's really, really amazing to have different athletes and different parts of your day where you can go out and go for a bike ride, and just completely switch off and think about something else and it makes you a lot more productive in other parts of your life, I find.

Balint: Iron man. Crazy. Where is it, the location?

Finbarr: So Iron Man is in Idaho, but I wouldn't recommend it for everyone. It's a big commitment.

Balint: It's not even my next step. I've done a half marathon. I think maybe I will stay with that or maybe the next step would be a full marathon.

Finbarr: You're probably better staying with the shorter distances.

Balint: The last question. You worked at different places, including Shenzhen, China before and you come from Ireland. What kind of critical cultural differences have you seen which were kind of memorable and you could even overcome?

Finbarr: Yes. So I think just communication is very complex but it's also very different in different countries and different languages. And so it's important to understand the place that you are in and the people that you are with and their preferred communication style. So in Shenzhen people wanted to communicate over WeChat and we were trying to use Skype. So as Westerners there you have to just switch to whatever the norm is there. And again, in the U.S. and with a product like Slack every company has like a different way of interacting with each other. So it's important to spend some time and just understand the culture there and to adapt to that as well. But whatever



culture, nothing really beats just going out in person conversation, having a coffee, or even better, having a beer and having that face-to-face communication.

Balint: Yeah. The best. I have seen the same issue regarding WeChat when I went to Asia I was surprised because I was like, “Why don't they use WhatsApp? In Europe we use WhatsApp.” It's the easiest. Everybody's using WhatsApp in Europe. But as I heard, they are not using it and in the U.S., as I heard, it's not that popular as in Europe.

Finbarr: Yeah. I have friends in so many different networks now that it's hard to keep track. But yeah, for my European friends I'm on WhatsApp, WeChat for Asia and then just Facebook, Messenger for the U.S. It's crazy how many there is and what the norm is.

Balint: Yeah. So before now finishing this interview completely, one last question. How are you best reachable - by e-mail or social media?

Finbarr: Yes, so email is easiest. It's my full name F-I-N-B-A-R-R, finbarr@fictiv.com. Or if anyone would love to chat, or anyone is in the Bay Area, I'm always around for a coffee or a beer.

Balint: Excellent. I appreciate it, Fin, for this in-depth discussion on prototyping and discussing all the topics how Fictiv started, what people should concentrate on when doing crowdfunding, even before doing crowdfunding. I learned a lot and hope the listeners also could learn a lot. Thanks.

Finbarr: Thanks so much for having me on and I've really been enjoying your podcast. I'm really glad that you're doing it. Thank you.

Balint: Thank you. I have a new announcement to make. Well, first thanks for listening to this episode. You can download my key takeaways from the website for the first 10 episodes, if you want to have a quick overview of things discussed or if you want to refresh your memory. In addition, as usual show notes, links, transcript, pictures are all on the website at the hardwareentrepreneur.com. Till next week.