

EPISODE 730

[INTRODUCTION]

[0:00:00.3] JM: When a startup finds product market fit, the adoption of that product can grow rapidly, turning a startup into a high-growth company. All of a sudden, a startup that was struggling to find its first customer is bombarded with new challenges. The startup has to hire tens of new employees. This requires raising capital, so the startup has to meet with investors and lawyers.

A rapid influx of new customers puts a strain on the engineering and the customer service elements of the company. There is too much work to do and there's only so much time in each day. The CEO of a high-growth company is up late into the night, answering e-mails and losing sleep, but these are good problems to have, and so the company is in a state of exuberance. The CEO must balance psychological health and the stressful task of scaling a company.

Elad Gil is an entrepreneur and author of High Growth Handbook, a book of lessons and guidelines about how to navigate a startup that has found product market fit and is beginning to scale. High Growth Handbook also includes interviews with experienced entrepreneurs, such as Marc Andreessen and Patrick Collison, whom Elad met with as he wrote the book.

Elad joins the show to discuss his book and his own personal lessons of working with companies such as Twitter, Google, Stripe and Coinbase. Elad has worked at several of these high-growth companies and invested in others. He's gathered a lot of wisdom from these different experiences and it's really valuable to find these lessons in his book, as well as in this interview.

Before we get started, I want to mention that we are looking for several roles at Software Engineering Daily. You can go to softwareengineeringdaily.com/jobs to find these roles. We're looking for a several journalists, a podcaster and an entrepreneur in residence. If you're interested in any of these roles, you can check out softwareengineeringdaily.com/jobs. We'd love to take a look at your resume.

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[0:02:09.8] JM: How do you know what it's like to use your product? You are the creator of your product, so it's very hard to put yourself in the shoes of the average user. You can talk to your users. You can also mine and analyze data, but really understanding that experience is hard. Trying to put yourself in the shoes of your user is hard.

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Thank you to FullStory.

[INTERVIEW]

[0:04:31.3] JM: Elad Gil, you are an entrepreneur and the author of High Growth Handbook. Welcome to Software Engineering Daily.

[0:04:36.5] EG: Thanks so much for having me.

[0:04:38.0] JM: Your book is about how to operate a high-growth company. There are methods of running an early-stage startup that don't work as well when that startup enters high growth. There are certain processes that start to break. When a company enters into that high-growth phase, what are the things that start to break?

[0:04:58.7] EG: Yeah. I think the short answer is almost everything at one company or another. A lot of the things that tend to break the most, so tend to happen around things that are very people intensive; so coordination, planning, product remapping, all those things that are dramatically more complicated than the other piece of it is the complexity of an earlier stage company relative to the complexity of a late-stage company is pretty small.

In other words, the surface area about early stage company is basically planned product market fit. They don't run out of money to pay with your co-founders, which are honestly all three very hard things to do. From early stage company to some a lot more complexity in terms of adding new product lines, developing new different ways to distribute your product or market your product, internationalization by other companies, like state grounds, getting liquidity for your employees. The range of things that you actually have to do in a late stage company goes up dramatically, or I should say a cross-product market fit company, all of those are dramatically and that means that there's lots and lots of different areas that can break.

Often those things, they come in causes of those breakages, or either you have the wrong people in place, or you don't have processes that really allow you to coordinate properly across a large group of people. A large group could be tens of people and doesn't have to be thousands of people. Even then, you tend to need to operate in different ways relevant if you were just five people in a room.

[0:06:13.3] JM: High growth usually means that the product of the company is working and the startup has gone from a successful startup to a high-growth company. Then there is an optimism that develops within the company. This optimism is great, because it can propel the company forward, but it can also cause missteps, because if the company becomes too grandiose, they can overstep their core competency and make some mistakes. What are the steps that a CEO should take to manage their own psychology during this high-growth period?

[0:06:51.4] EG: Yeah. There's a lot of different things you should do to master on psychology. I think. I think those include number one, figuring out what are the things that you like to do and things that you don't like to do as CEO, figuring out how to delegate many of the things that you don't like to do. I think a lot of CEOs burn out, because they're spending all their time on comp plans, or all their time on people issues and really what they want to do is focus on product, or on building that product or selling. Often, it means building out an executive later that can help you with those things.

Second area is just finding time to recharge. Date nights with your significant other, or whatever it may be; taking short vacations. Those things become really important, particularly if your default nature is to be a workaholic. I think that's important for recharging. Then third is making sure that the company is broadly heading in directions that you care about strategically, and planning the time to pull up in the day-to-day minutia and really be able to think longer term and bigger picture than I think. People often think so focus down the weeds that they lose that ability. Yeah, those two other things that I mentioned really have people take a step back and abstract [inaudible 0:07:58.4].

[0:07:59.9] JM: In your book, you have plenty of suggestions and rough guidelines around how to manage a high-growth company. There aren't that many hard and fast rules. It's a lot of pragmatism and suggestions and you're acknowledging that different companies are going to experience their high-growth state differently. Are there any universal rules of high-growth company building?

[0:08:27.7] EG: I think, the good generic startup advice is that there's no good generic startup advice. Everything is contextual and you need to each company, that's that, there are certain things that I do think most companies should do. Those include things like you doing regular one-on-ones with their reports and building out a proper executive team later that you can delegate to and finding a band of people who can go and execute big functions for you; finance, legal, engineering, product, HR, etc. Finding people who'd run those functions before, or who's [inaudible 0:09:00.8] who really have the capability and scale.

I do think that a lot of it ends up being first, about people issue, second about process issues, then lastly, about strategy. I think that a lot of the places where people screw up is they have the wrong people in place for too long and those people don't have a trajectory of the company, or they don't think smartly enough about different challenges that they face.

I think the other place where companies tend to blow up is they don't have the right set of processes and HR, or other things get really out of control and we've seen that recently with a number of companies in Silicon Valley, in terms of HR issues driving the CEO out, or driving the demise of the company. Processes are basically probably applicable towards that.

Then lastly from a strategic perspective, a lot of companies miss their true capabilities in terms of where they should be going as a company. You see these companies that end up as a 10 billion dollar market company, which is amazing, but they could have been a hundred billion dollar market company. Those companies are often ones where they just weren't thinking very strategically about what the company should be doing and what's the next product, or should they be focused on distribution, or should they be focused on new lines of business? I do think that you see these different levels of the other modes, be at the people level, the process level, or the strategy and product level.

[0:10:20.9] JM: As these companies grow, you do want to inject some process as you said, to avoid these kinds of HR issues, or the issues that can develop due to a complete lack of process. You also want to avoid the company taking on too much of a political nature for as long as you can. The more process that you inject, the more a company can bend towards a political nature. If you're running a startup and that startup is turning into a high-growth company, because you've got the product working, how can you prolong that startup feel and avoid the tendency towards politics?

[0:11:01.8] EG: Yeah. I think there's three or four different things that are mixed in that question. There's what are politics and how do they arise and are they good or bad? How do you avoid them? Usually the term politics imply something bad. The second question is around how do you keep things nimble? Yeah, maybe the third is how do you keep attracting people who are excited to work in more of a startup environment?

I think in terms of the first point, which is around politics, to some extent if you're two people, you have politics between you, right? You're trying to convince somebody of something else, or to adopt your viewpoint, or to use something that you want them to do. To some extent, that's politics. No matter what the size of the company that you have, different people will be advocating for different things and that's actually a good thing in those cases; as long as they aren't advocating for themselves, instead of advocating for the company.

I think part of it is figuring out culturally, how do you reinforce constantly that people should be doing the right thing for the company? If they do that, everything else just follows and fits nicely. In general, what I founded is that when people are early in their careers, they tend to worry about themselves a lot at a high-growth company.

For example, when I joined Google, I joined around 1,500, 2,000 people and there's a series of reorgs that happened basically every six months across the entire company, because the company was growing so rapidly. I think it went through 1,500 to 15,000 people over two and a half years, or to me, three and a half years. I was constantly worried about I appeared we're getting promoted and that wasn't. Or what did it mean that somebody new came in to our org and fit over? All these other things that honestly, I shouldn't have been worried about.

When my first company got a part at Twitter, there was a big reorg that was happening on the product org and Dick was the CEO at the time; asked each person to come and tell him what they wanted to do. Many people on the team ended up advocating for themselves very aggressively, and so to advocate for the company. It sucks for them and actually got fired for that later.

In my case, I just went in and said, "I just want to do what's right for the company. Tell me what you need me to do. It's not about me, it's about the company and organization I'm in." That basically led to me getting promoted and then me doing all sorts of things that I normally wouldn't have done there.

I do think that you really have to figure out how to frame things to people early, so they understand that there are in some sense, good politics. I would call it that, but people should be advocating for their ideas. They should be convincing other people of things they think are

important, but they should also recognize when to do that and when not to do that. What's the real role in a conversation? Are they a decision-maker? Are they an influencer? What role are they playing?

Then based on that, they may need a backup sometimes and it may not be their decision and that's okay too and they should accept that. If you teach people those sorts of principles, it actually helps a lot not only on the politics side, but with the two other points that I mentioned, in terms of keeping things more nimble. Because then really what you're focused on is putting in as lighter weight a process as possible, because there's a lot of trust between people on the organization, but also you realize that a lot of people are just ultimately advocating for what's good for the company versus what's good for them.

I think when I was at Google early, I worked a little bit with Sundar, who ended up as CEO there. He was notorious for always putting the company first. When he spoke in a meeting, people listened very carefully, because there was a high degree of trust with him across the team, even at the very early days where people just believed that he was fundamentally going to do the right thing. Therefore, what he was saying was a neutral view in some sense. He was really trying to just trade off things between different choices.

That's politics. I think politics are great. If it's people backstabbing each other and advocating for power, there's examples of that in Google as well, then obviously that's really bad and it creates a bad environment for people.

In terms of keeping people nimble, I think that – or keeping organizations nimble, I think there's a few general principles. I mean, one is to effectively want to start teams over time so that roots are small and you don't have 70 people making a decision. You have much smaller bodies of people who are actually doing, or working on specific projects, or sub projects. One is sort of, what's the maximum team size you want each team to get to?

Then I think there's other questions around how much is a driven top-down versus bottoms-up? Then also the people do hire, having a slot for people who are more entrepreneurial in terms of either their backgrounds, or mindsets, or even what they did when they were in school or in their

jobs. Other people who tended to take initiatives. How do you spot those people? Because those are the people that are going to be really valuable for a nimble environment.

You will however always want some people who frankly don't want to always be constantly reinventing everything, because if the only type of people you had were people who are constantly reinventing things, as you stay on that company that actually leads to chaos. Because there are things that you have to just grind through on a multi-arc. I do think there's tradeoffs between the boldness and stability as well in some sense.

[0:15:39.1] JM: There's also a way in which a focus on unambiguous communication and results-based judgments can avoid politics. You focus on this from many different points of view in High Growth Handbook. The avoidance of ambiguity, a leader should be unambiguous in their communications, in their conveyance of goals and responsibilities for the people within the company, as well as the fact that you're constantly evaluating – people should constantly be evaluating each other based on results.

This comes in terms of hiring, if you're hiring somebody. If you're hiring a sales person for example, and you don't want to get charmed by the salesperson; you want to see their results, you want to talk to their references, you want to know that they have been part of some sales initiative that has had material results. If you're evaluating an employee, you want to evaluate them in terms of their KPIs over the last three to six months and can you actually quantify what they've done?

If people in the organization are getting rewarded based on these quantitative metrics, then people are going to start to value the negative side of politicking a little bit less and they'll see that there's an emphasis on that results-based atmosphere.

[0:17:03.2] EG: Yeah. I think that's very true. As long as you can measure the right things, then you can reward the right things. I think it's hard sometimes to be able to measure things. I think in sales actually, it's one of the easiest places to measure things, because that salesperson is either pitting their numbers or not.

I think, there's lots of other organizations where it's much harder to assess. For example, say that you're on the litigation team on the legal side of the company and you don't have any lawsuits that year. That's actually a very good thing for the company in some sense if you're not getting sued by anybody. Your job is to respond to lawsuits. If you've responded to zero lawsuits, are you doing well? Are you doing badly? What should your goals be? I do think that's completely true. I think the challenge of a team in a high-growth company is to manage those areas where there is ambiguity naturally.

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[0:18:00.6] JM: Kubernetes can be difficult. Container networking, storage, disaster recovery, these are issues that you would rather not have to figure out alone. Mesosphere's Kubernetes as a service provides single-click Kubernetes deployment with simple management, security features and high availability, to make your Kubernetes deployments easy.

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One reason I am a big fan of Mesosphere is that one of the founders, Ben Hindman, is one of the first people I interviewed about software engineering back when I was a host on Software Engineering Radio. He was so good and so generous with his explanations of various distributed systems concepts. This was back four, or five years ago when some of the applied distributed systems material was a little more scant in the marketplace. It was harder to find

information about distributed systems in production, and he was one of the people that was evangelizing and talking about it and obviously building it in Apache Mesos.

I'm really happy to have Mesosphere as a sponsor. If you want to check out Mesosphere and support Software Engineering Daily, go to softwareengineeringdaily.com/mesosphere.

[INTERVIEW CONTINUED]

[0:20:19.6] JM: In terms of the product development side of a company, you have the product management, you have the designers and you have the engineers. You write that a successful product manager will write very crisp product requirements. This will foster a productive relationship between the product manager and the engineer, as well as – but I think between the product manager, the engineer and the designers, because if the product manager has the crisp product requirements, again, that lack of ambiguity, then the software engineer really knows what the deliverables are.

That's good because the software engineer already has enough ambiguity to resolve themselves, in terms of what database do I use and what framework do I use and how am I connecting to this other team and so on? You don't want creative freedom from the product requirements side of things. Explain how your ideal vision of the interaction between product management and design and engineering should fit together.

[0:21:26.1] EG: Yeah. I think ultimately, when all is said and done, I think that product manager is at a very high level, in some sense act as like cross-functional owner directly responsible for the success of a product. Obviously, an engineering manager is responsible for the engineering deliverables of that. In some case, it's more in the case of designer, the designer it's really about the design aspects of that. I think the product manager often also has to deal with all the other aspects, in terms of alignment with marketing and sales in the end. In some cases, finance, or legal, or other areas.

They should be pulling in and collaborating very closely with engineering and design along the way. When all is said and done, I think product managers are really responsible for setting a crisp product strategy vision; what's the goal of the product? Is the customer, what have been

the use case is? What are the success metrics, things like that? Also, I think in doing things like who are the competitors? How do we differentiate? What are some of their sales channels? They should really be thinking of it more holistically. I think a lot of product managers today actually don't do that. They tend to be a little bit more point people on some of these things and that sometimes leads to conflicts with engineering and others.

I think they also should be number two, focused on prioritization. What are the most important things for the product? How do you prioritize them? Of course again, they'll be doing this hand-in-hand with engineering and design. Then I think the two other key areas are basically execution. Helping to drive timelines, removing obstacles, finding resources advocating for the product, then lastly, just communicating and coordinating all the stuff for the rest of the organization.

I think, when I think of great product managers, they're great at those four things; product strategy, prioritization, timelines and execution and then communication. Really, they're meant to be that directly responsible of the visuals coordinating the success of the product across the organization that we're going to have to launch, but then also after the launch of the product as you continue to iterate both the product, as well as the [inaudible 0:23:25.8].

I should say by the way, there's no one-size-fits-all for product management. I do think there's multiple different types. If you're more of an enterprise-centric product manager, or focused on the B2B side, you're also be acting in some sense as the voice of the customer into the product. If you're a consumer product manager, you may be a little bit more focused on what are the sets of delectable features relative to your consumer base? Obviously, those things have been morphing and merging over time to see then how the software has changed. At a high level, I think there's different exit hands as well.

[0:23:59.1] JM: Yeah. You break these down in the book, the technical PM and I think there's some other focuses on categorization of what kind of PM are we talking about here. How did your perspective on high-growth companies changed as you were writing this book?

[0:24:16.3] EG: It's a question. I think with each of the interviews that I did, so like a structure is there's tactical advice on different areas of starting a company. How do you manage your org?

How do you [inaudible 0:24:27.7] funding? How do you find other companies? How do you think about product management, marketing, PR, etc.? It's a lot of different function we should worry about. How do you manage your [inaudible 0:24:36.8]?

Then each chapter, or a segment basically then had an interview with the practitioner about a specific topic. There's a conversation with Reid Hoffman. He's written this great book called Blitzscaling around scaling companies, around corporate management. How does he think of himself as a board member? What is the importance of board members?

There's this first-person practitioner view. Each section there, for example, in the area on hiring COOs and should you do it? There's a conversation with Aaron Levie that CEO box around why can you hire the COO and how we onboard that person and what was that relationship like and things like that?

The joy that interviews where I think a lot of things came through that I hadn't really thought of before and that I think that's where I want the most and I think also there was some perspective that I just disagreed with on certain topics, but I thought it was important to include because again, it's just opposing advice and ultimately, either people running companies or people at companies will get conflicting advice over time and have to choose which piece of it they want to listen to. I think it actually reflects the way the real world works as well.

[0:25:40.0] JM: Yeah. I think what's good about this book is a lot of it feels very durable. There are aspects of company building that seem to change with the times. If you go back and read some, like The Lean Startup, it's a very durable book, but there are elements of that book that have probably decayed over time. Just because things change in terms of the funding environment, or the pace of product development, or just the way cloud services can speed things up, or the way machine learning – who knows? Maybe there'll be some emergent role, because of the emphasis of machine learning on – or the effects of machine learning on product development.

It'll be interesting to see which things, but I think it goes back to what you said originally. Like the only good startup advice is that there is no good startup advice. I think one of the lessons you can take away from a book like this is what is the meta? What are the meta ways of thinking

about startups? How can you just get yourself in the slipstream of startups, so that you're thinking about the changing cadence of what is good startup advice?

[0:26:43.9] EG: Well, that was definitely the intention of the book. I think there's certain universal themes, just because we're people and people act a certain way and coordinate a certain way. I don't think it's a mistake that organizations that function, in some sense more or less the same way for hundreds of years, if you just look back to the original corporations.

Obviously, there's big changes in terms of distributed work and other things that are happening now. When all is said and done, people are people and they interact with each other in certain ways and they care about certain things and their motivations are the same. Really all high-growth company is the mass coordination of a group of people who accomplish a common set of goals around the product and market.

When all is said and done, I do think there are some universalities to your point that are driven by the fact that people are fundamentally the same. I think it's [inaudible 0:27:28.6] is one of the partners at Square Capital who has a framework for consumer products where basically it says, every great consumer product it's a kind of one of the seven deadly sins. It could be gluttony, it could be sloth, it could be something.

You start looking at Instagram and other products and you're like, "Okay, that makes sense." There's pride and there's gluttony and there's this other thing. I do think there are universalities in the way people function that are then reflected in companies. Then to your point, there's lots and lots of innovation that happens as well.

[0:28:00.0] JM: You came out to Silicon Valley around 2001. This was just as the internet market was collapsing in that first internet bust. In that early career experience of being in a recession, that must shape your mentality today, either in terms of saving money, or in terms of just not taking things for granted. How does the experience of entering the software market during the recession, how does that shape your mentality today?

[0:28:29.7] EG: I think it shapes hopefully mainly in positive ways. In part, I think we'd now had a generation of founders and executives who've never seen a recession, or have never seen a

downturn. In 2008, from start of perspective was a bit of a blip, but it actually wasn't that strong. I let it go what happened in financial markets or other things. My first startup was funded in 2008 and I joined Google in 2004. 2000, 2001, 2002 were all really rough, or I should say 2001, 2002 are really rough periods out here and maybe until the early – or mid-2000s.

I think it makes you understand that we're not always going to be in a capital-rich environment, even on this book we're hoping that. When capital is full, there's all sorts of things that you can do in terms of business model, or grabbing market share, etc., that you can't do when capital is scarce.

For example, if I was running a large private company, I probably would be rushing for the exits to take the company public, so that I could tap into a broader capital base, but also have a stock that I could use for acquisitions or other things. Also during any incoming downturn, because I do think at some point the markets will come down. Usually there's a three to nine-month lag between public markets and private markets. We just saw that in the crypto world, where before this latest stop Bitcoin have, there was that prior different 20,000 or so down to 6,000. Then six months later, all the private market valuations slammed down pretty hard.

I think, public market is the same thing. Equity is the same thing will happen and it has happened in the past. The big concern is we have this big compression and company multiples and private company multiples will come back dramatically, which means it will be really hard for people to raise money, or to exit. The people who go out now raise a bunch of money in public markets. I mean, if they really want to they can even do a stock buyback later. They also then have a currency and cash position and stuff that they can use in all sorts of ways, and so it will be much more attractive to buyers.

I do think it colors how you think about the public markets, but then it also colors how you think about capital and when you should be doing capital aggressive businesses, or when you should be really focused on the recent startup stuff.

[0:30:47.0] JM: We're talking in late 2018, November 2018 and there's been a slight drawdown in the public markets. It seems that even if there were a complete economic collapse, a la 2008, in the public markets, there's so much untapped potential from just things like cloud and mobile

and machine learning, and the fact that it's really cheap to build companies today. Startups can be really capital-efficient and can still do a whole lot.

It's essentially free to start a company with AWS. It seems like investments in the early stages would at least – would probably continue and would be pretty proliferate, especially if people are patterning on the previous economic collapse. I feel I hear a lot of people say, they're just waiting for the public market to collapse so that they can plow more money into early-stage startups. Do you think that concern around being able to exit, or being able to raise money, does that more apply to the later stage companies, or does that – do you think that'll also apply and have a strong impact on the very early-stage startups?

[0:32:06.6] EG: I think most of the impact will be later stage. I think to the point you made, it's really inexpensive to start a company. Because of the reach that internet has now, there's never been a time where you could reach billions of people so easily in such large scale and get very large numbers of customers rapidly through a pretty seamless channel being online. I do think it's never been easier to start a company.

The flipside of it is that also means there's a lot more noise. I wouldn't be surprised if it's five, six, 10 times more companies today than there were just five years ago. Where the real bottlenecks tend to happen, at least today is it the series A of the companies just can't reach their next round if they're venture-backed. Obviously, there's lots of models besides just raising money and being on the venture train. We can bootstrap, or get paid by customers other than. If you are on the venture side, the series A is selling for you to bottleneck. Then on a later stage side, there's lots of wait station on capital.

I would actually argue that that capital is doing in some sense a disservice to a lot of startups, both early and late, and that it's keeping certain companies going a lot longer than it should. For example, if you raised a seed and you can't raise an egg, you can end up raising two, three bridges on a safe and just keep raising money and keep going. Maybe frankly you should have died, or exited.

You're actually tying up lots of really talented people for prolonged periods, working on things which may actually be very bad ideas. Most startup ideas aren't bad ideas. It's a handful that

seem like bad ideas, but are actually good ideas that end up doing really well. If a startup is working on something obvious, they're probably isn't a very good startup, because if it's obvious, everybody would've done them. Every startup that really works, to some extent has to be a little bit [inaudible 0:33:46.3]. There has to be some miracle back in the company that turns out to be true and then it becomes massive.

If you think we're in this weird situation where we're tying up a lot of talent for a long period, this was one negative of a capital rich environment. The flip of it is there are certain business models that require capital, but this won't be possible once a lot of the money goes away. There are businesses where you want to invest hundreds of millions, or billions of dollars to get market share, or there are businesses where it doesn't make sense there was a bunch of money for a long period of time. Those will just get tend to get tougher. That doesn't mean they'll go away, but they will be harder to execute if capital markets dried up.

[0:34:22.9] JM: You are an investor, but you've also started several companies, you've worked at several high-growth companies. You really have a panorama of different experiences. I wanted to talk to you about Color Genomics, which you founded in 2013. Your company, the original product was developing a test for genes that are associated with cancer. Since then, you've expanded into some other types of testing, like pharmacogenetics. Tell me about the hardest parts of starting and growing a genetics company.

[0:34:58.1] EG: Yeah. The impetus for Color was in some sense really driven by my co-founder Othman Laraki's story. He's the CEO of Color. He's very public with the fact that he himself was a carrier of a BRAC2 mutation, which she inherited from his mother and grandmother. His grandmother died of cancer. His mother got pressed into twice. He himself was at high risk for certain cancers that man can suffer from, because of this genetic mutation.

The driver for the company was really about personal experience, in terms of asking how can we help create cheaper, or more accessible version of this product that at the time cost many thousands of dollars and is very hard for many people to get. Example would be if you're a woman with breast cancer over the age of 45, in terms of when it was diagnosed, your testing may not be covered by insurance. Well, if you are under 45, you know it would have been

covered by insurance and it was really just sent you to diagnosis in that. You may have had a cancer already, it's just when they found it.

You're faced with a 4 or \$5,000 bill. You may not be able to afford it and you may not know what the right treatment options, or the screening options are for you, in terms of mammography or other things. Really, the benefit is of the company was to try and be helpful to large groups of people with their health.

I think there's a lot of extra complexity when you're dealing with – but healthcare is a physical products. In our case, Color is doing both. One is you want to make sure very early on that you're focused on right regulatory top and that you're really focused on being compliant, relative to doing the right things from the regulatory perspective, but also from a patient, calm perspective. You don't really want to move fast with great things. You actually want to move cautiously and be careful about certain aspects of the product, because you don't want to get – you want to avoid a wrong result. For somebody, it's such a practical information.

One is just what's the fidelity at which you can launch? I think the second is if you're dealing with physical growth, it's always much more complicated. Color runs a fully automated next generation sequencing lab. It has robots having liquids to do the DNA testing. It has a big supply chain of different manufacturers that are used. As part of that, it ships and receives kits around the country. It's a much more complicated endeavor than just writing software.

Obviously, it's a great software and has been as well as an enormous amount of work that it's spend on data, science and machine learning and e-commerce side of things. There is that extra complexity of physical goods, law, regulations, etc. I think the hard part of Color were those extra things.

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[INTERVIEW CONTINUED]

[0:39:42.1] JM: Genetic testing is going to have a multi-dimensional impact on healthcare, or it already is. You gave the example of your co-founder being can screen himself for a cancer gene. If you screen yourself for a cancer gene, maybe you can have more regular checkups for looking for specific types of cancers. You can change your healthcare regimen based on your genome. Another recent development that Color Genomics has support for is this pharmacogenetics. Meaning, you can find genes that are associated with certain prescription drugs.

If I'm going to take a anti-anxiety pill, maybe I would want to screen myself genetically first, because I want to know if I'm going to have some really harmful drug interaction with this anti-anxiety pill. People have really bad drug interactions all the time and having genetic testing as a

step in the loop before prescribing a medication could prevent a lot of really bad outcomes. What are some other ways that we're going to see genetic testing impact healthcare?

[0:40:58.9] EG: Quick aside, I don't know if you mind editing out the pharmacode genetics statements that were just made, simply because –

[0:41:05.4] JM: Oh, sure.

[0:41:06.1] – I haven't – at this point, I'm just [inaudible 0:41:07.7] with Color, and so not as close to that part of it, and so I don't want to speak out of terminal. If you don't mind just editing out the pharmacogenomics part, but I'm happy to answer the question that was asked in terms of how well genomics transform healthcare. I'm more probably –

[0:41:20.2] JM: Happy to.

[0:41:21.5] EG: In terms of how genomics will impact healthcare broadly, to some extent it's one of the really crisp datasets that exists about a person. They can really hinge upon multiple aspects of disease, of treatment, of how they should be thinking about different aspects of their life. Obviously, the way you live your life matters a lot. You should be exercising and sleeping well and not drinking too much alcohol. There's a variety of things that you should just be doing for baseline health. In addition, you may be predisposed to different conditions. Could be certain forms of cancer, it could be cardiovascular diseases, it could be when you're having children. A lot of people may do different types of carrier screening to make sure that their children don't inherit cystic fibrosis, or other pretty tough diseases.

There's other aspects around how are you going to respond to, or interact to everything for different foods, the different drugs. I do think that there's a lot of wealth in your genome that can really be translated into preventative health insights, or in some cases, things are just more wellness or interface for people. I do think this is a core component of any future preventative health regime that will be rolled out.

It's really interesting if you start thinking about it on a population and nation state level. For example, if you have a socialized healthcare system and you're a company that's thinking about

who should I be worried about for different types of diseases, there's the demographic and environmental and lifestyle information you can use as part of it. Also, understanding who's at highest risk for cancers early in their life, or who's at highest risk for heart attacks, or other cardiac events, or who's at high risk for familial Alzheimer's.

Those sorts of things can be really powerful in terms of how do you think about the disease burden that your society will face overall, as well as where you should be allocating resources. Who are the people who benefit most from screening, or who are the people who benefit most from certain types of public education? If you have a lens into the genetics, you actually have a pretty clear view, or a reasonably significant proportion of the population for at least a very important subset of diseases.

I do think what we'll see over time is this evolution, or emergence of population risk management based on the genetics of populations. That will of course decouple to the lifestyle and to self-tracking devices and other things. I do think it's one of the really integral datasets when we make use of that. I'm extremely excited about the future that comes with everybody being tested. I think at some point, we're going to end up with a scenario where every baby get sequenced at birth and from that point on throughout their life, at different key moments, you should be pushed information that's relevant to that stage of your life out of your genetics. If you're in your 20s and 30s, you won't be thinking about childbearing and you'll be thinking about certain predatory diseases. In your earlier days and teens, you may be thinking about drug reactions, or allergies, or asthma, which are a little bit harder to think about your genetics perspective. Genetics gets to play some role. Then as you get older, there's all sorts of diseases – disease states that will really matter.

I think your genome in some sense will be a very fascinating map to the set of things you have to worry about from a health and wellness perspective over your lifetime. I'm very excited for the day when it just becomes standard practice. I think one of the challenges with medicine is that things are very slowly moving and a lot of innovations that you would expect just haven't happened yet. A great example of that is actually the adoption of machine learning, or computation-based decision-making in healthcare.

A great example, let me ask you this, what year do you think the first computer was able to predict what infectious disease a person had better than any professor, or any person of a medical – in Stanford had?

[0:45:09.5] JM: Oh, 2007.

[0:45:12.7] EG: It was the late 70s.

[0:45:13.8] JM: Okay.

[0:45:14.8] EG: There's this expert system that they called it back in the day, called the MYCIN Project at Stanford. You can look it up. It's super fascinating, where they basically created an expert system that you fed in some data and will tell you what effects the disease you have and are performed the 60 experts at Stanford at that time.

Often, a problem with healthcare isn't an issue of technology, it's an issue of market structure and adoption. There's lots and lots and lots of technologies that make a huge impact in healthcare today. These aren't being adopted because the incentives and incentive system is software against it.

[0:45:46.3] JM: Indeed. Now there's a common trope that white-collar jobs, like radiologists will be eliminated by technology. Whether or not that's the case, I do hear that in the genetic counseling industry, they can't hire enough people. Genetic counseling is like radiology in the sense that you need somebody to interpret the data and you can imagine the role of the genetic counselor just getting more and more complex over time as we get better and better tools for exploring the genome and exploring treatments and interventions that are associated with an individual's genome. How do you think the role of the genetic counselor will evolve over the next 10 years?

[0:46:35.2] EG: I think when all is said and done, one of the big issues with healthcare comes back to this lack of technology adoption. Obviously, the role of the genetic counselor is really important. If you actually look at where they spent their time, on average a genetic counselor

may spend six, seven hours with a patient, or excuse me, on a patient, but only half an hour with a patient themselves.

A lot of their time is doing things like drop pedigree, it's data entry. It's a lot of very manual repetitive tasks. Frankly, they're probably over qualified for. One of the things that Color has done internally for genetic counselors that works with some of the patients, Color provides results for is really building out a toolset that allows the vast majority of the genetic counselor time to go to patient care, versus to all the things that software can actually do extremely well.

The premise of Color in some sense, is software eating genomics, or software eating genetic testing. It's how do you take out all the manual, repetitive, in some cases a nerve from labor and then therefore, can you use software to reduce cost in the increased accuracy, so that the really talented healthcare professionals can spend time on the things that are most valuable for them to do? I do think that the real issue in the industry isn't just a lack of genetic counselor, it's the lack of tools that allow genetic counselors to focus on a fixed direction is important.

[0:47:56.1] JM: You've been involved with both Coinbase and Stripe. These are two of the companies that are most interesting in the high-growth phase right now. They're both payments companies. What are the barriers to the crypto ecosystem, which I would consider more closely aligned with Coinbase, what are the barriers to that crypto ecosystem interoperating more smoothly with the conventional payments ecosystem?

[0:48:25.2] EG: I think at this point, crypto isn't really that broadly used for payments. I think it's mainly used as like a store value, or store well. Then in some cases, I guess may consider therein, for example, gases in some form of payment. Maybe that's the counter example. At least, when I think about where most of the market common crypto comes from today, I think it's from this notion of an investable asset that is government and censorship resistant. In other words, nobody can come and seize it from you and nobody can modify a transaction, because of consensus and the way consensus mechanisms work.

I do think crypto today is very different from payments, at least in terms of the primary use case. Obviously, there's lots of secondary use cases and everything from Bitcoin to Monero to Zcash

are being used for other types of transactions over time as well. My understanding is most of the volume is still in the – in financial investment sort of value.

The hope is of course about with change with time and in the original Bitcoin white paper, there is a lot more focus on payments than there is today in terms of actuality of how it's being used. You think a lot of the barriers to entry on the crypto side are around – really the long-term barriers, or things like regulatory compliance and making sure you're doing the right thing relative to SEC and other government agencies, I think it's security. You have a huge tiny pot of money that if stolen can truly disappear, which isn't true many other types of financial transactions, unless you're talking about USD, which is also the primary black market currency.

Then you have depth and breadth of there are things that you can offer, or against securely, I think it's very easy to offer – securely, it's very hard to offer securely in the mass of those brand. I think that's really going to matter.

[0:50:10.0] JM: Right. Now in terms of use cases, ICOs were quite a useful financial instrument. They got a bad name quite quickly, because ICOs were abused. Fundraising is arguably one of the use cases that has worked the best for crypto currencies. Do you see this as a viable fundraising? I mean, with something like Filecoin, or even just with Ethereum itself, these seem very viable fundraising use cases that just got lost in a hurricane of garbage ICOs. What are the parameters under which an ICO makes sense?

[0:50:51.4] EG: Yeah. I think that one of the great points of confusion for a little bit in the crypto ecosystem was the degree to which the value of Ethereum was driven by a mix of fundraising, which then led to it being used as a reserve currency in the unit of denomination and exchange on a lot of exchanges. What's there for them made it in some sense. A lot with Bitcoin, they have a reserve currency or store value in the crypto world.

I do think that a lot of the primary use cases, or primary value ascribed that today is actually going to buy that, versus driven by the decentralized global computer side of it. Now obviously, that and I worked with fundraising and other things. Say you have 20 tokens. Fundamentally, I actually think the really exciting part of crypto is the degree in which you're working in financial services today. It has enormous promise to do other things later, but I think its impact on

markets is really the super valuable and interesting thing that's emerging from it. I do think there's a lot lost there.

In terms of what makes for a good ICO, I think it really depends. It depends on the jurisdiction you're in from a local perspective. It depends on what you're trying to accomplish. It depends on the transparency that you're providing to the people who are participating in that ICO. It depends on their expectations of the clusters. It's not like Kickstarter. There's some Kickstarter's where people just want to effectively donate their money to a good cause and hope it works. Those other Kickstarters before are like, "I need this product tomorrow and I want you to ship it within the three months that you cost it will ship it." Different people participate with different mindsets. Kickstarter and I think to some extent, ICOs fill that niche for certain types of software development around [inaudible 0:52:37.8] software.

[0:52:39.3] JM: Your book, High Growth Handbook explores lots of historical examples from Intel to Google to PayPal. These examples are all very useful, but technology startups are still a pretty new phenomenon. It's hard to know which of the past historical examples we should focus on and what lessons we should take away from them. Are there any particular examples, or laws from startup history that you think get over-emphasized that perhaps we should question a little bit more and maybe not go forward with so dogmatically?

[0:53:22.6] EG: I think there's tons of startup advice, which I don't agree with. Then there's a lot of stuff which I don't think is emphasized enough. Examples of things that I think are overemphasized is I think there's a little bit of a myth around equal co-founders that the fact that even need a co-founder. If you look at most of the most successful companies in history, they had unequal partnerships. There's only a small number of [inaudible 0:53:45.0] examples about. Unequal, I mean unequal in power or it may also mean unequal in equity. I think the power thing is more important. You look at Apple and Steve Jobs was really dominant. You look at Amazon, it was a single co-founder. You look at Facebook, Zuck was dominant and very unequal equity. You look at that S1 filings of LinkedIn, or a variety of other companies and you have an equity, unequal equity [inaudible 0:54:11.2] somebody in charge.

Then the counter example is really tend to be Google, right? In terms of where there is an equitable sweat, but even then Larry Page was a bit more in charge than Sergei was, until Eric

Schmidt went onboard. I do think one of the big myths is this equal co-founder really got accelerated to the Google days. I think it got propagated further more than it deserves. That be one example of something that I think that a lot of people talk about is just wrong, actually if you look at the data.

The things that I think tend to get under emphasized are the importance of commercial thinking as things start working. What's the real ongoing product strategy that you're going to be doing? What's your next product line? How do you think about diversifying around the core product that you built and then how do you really think about your sales channel and distribution as a strategic weapon that you have to use in the marketplace?

I think too many founders today get really lost in the let's just iterate on one core product and they don't really think strategically about distribution, they don't think about marketing very aggressively, they don't think about pricing, they don't think about buying other companies and the neighbor aggressively. I think a lot of what gets lost is that those lessons from history where if you look at the dominant tech companies, Microsoft and others of a prior era, they were very strategic about those things and that's one of the reasons they ended up dominant.

If you look at some of the biggest companies today by market cap, like a Google, or like a Facebook despite its mistakes, they've actually been very smart about those sorts of things as well.

[0:55:44.5] JM: All right. Well Elad, one more question. I enjoyed your book a lot and I think my favorite part of the book was the interviews and the fact that you would have these interviews and then you would have, I guess cliff notes versions that corresponded to the interviews. They weren't exact cliff notes, but you would have sections of the book that would be about mergers and acquisitions, or fundraising for example. Then you would have the fundraising, your guidance around fundraising and then an interview with Naval Ravikant, who is the founder of AngelList, so he knows a lot about the granularity of fundraising.

You have these rules, these guidances alongside a long-form interview, which is more of a unstructured way of discussing these same issues. Did you learn anything about interviewing people when you were writing this book?

[0:56:38.5] EG: That's a really good question. I actually haven't thought about that.

[0:56:41.6] JM: This is selfish. This is the selfish question, obviously because it's my business.

[0:56:48.2] EG: Yeah. I mean, I think I chewed at the way that I would any what I'd call like professional interaction and then a bird is evolved. I know it stands as well, but I represent as let me send them an agenda in advance of what the questions will be so they have time to think about it, so they aren't caught off the cuff.

There's a really interesting, okay let's dig into it further and the let's try and may get through in the time allotted, so things tended to be the fast-paced in terms of the conversations. Honestly, there wasn't too much more thought than that, so I at least I would appreciate any tips you may have since you've done a lot more than I have in terms of these things.

[0:57:23.9] JM: Well, I would say preparation is number one. It sounds like you already got it. Well Elad Gil, thanks for coming on Software Engineering Daily. It's been great talking to you.

[0:57:30.0] EG: Thanks so much for having me.

[END OF INTERVIEW]

[0:57:34.8] JM: Data holds an incredible amount of value, but extracting value from data is difficult, especially for non-technical, non-analyst users. As software builders, you have a unique opportunity to unlock the value of data to users through your product or service. Jaspersoft offers embeddable reports, dashboards and data visualizations that developers love. Give users intuitive access to data in the ideal place for them to take action within your application.

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