

Can a Smartphone App Provide Data About Product Adoption and Usage?

*This transcript was lightly edited for clarity.*

**Chris**: Welcome to the podcast. My guest today started out as a database developer. He turned down a programming position at a hedge fund to do bioinformatics at Cold Spring Harbor because he loves science so much. From there, he went to U.C. Berkeley for his graduate work in molecular biology and then he did a postdoc at MIT before founding what is now protocols.io. Please join me in welcoming Lenny Teytelman into the podcast.

**Lenny**: Thank you Chris.

**Chris**: Glad to have you here. So today we're going to talk about a different way to think about apps for marketing. I was introduced to you by Andrew Bertera of New England Biolabs as I was writing an article for the ACP-LS blog about smartphone applications. And that conversation with you turned me on to a whole new way of thinking about apps, so I thought it would be good to have you on this podcast so my audience can understand more clearly than having me explain it to them. The way I look at it, and you can correct me if am wrong, but most apps for marketing and sales are built to push information out to the customer or they are a branding tool. They provide a resource such as a calculator, something that helps a prospect do their job, and those are all great ideas, but what we might be missing is this opportunity on the other side of the equation which is what we're going to talk about today, and that's getting data back on product adoption, usage and so on, right?

**Lenny**: I think that's a fair way of saying it. The only thing I should point out is that, I have never worked in marketing, at a company, so there might be other explanations and other considerations of what typical apps are. I'm not an authority on that.

**Chris**: Sure.

**Lenny**: I'm just developing and how we're looking at, but from what I've seen in the mobile life science app market, it's mostly just little tools to promote, like giving out pens at a conference.

**Chris**: Right, hopefully a little more useful and relevant to their jobs, but yes.

**Lenny**: No, some are fantastic, absolutely, but it's usually just let's get our logo on an app.

**Chris**: Right. So tell me a little bit about protocols.io and what inspired you to start it.

**Lenny**: It was actually an app. And it wasn't my idea. It was a simple idea for a recipe checklist that started this whole thing. My entire academic career was derailed by a single phone call from the co-founder, of my close friend Alexei Stoliartchouk who called me in January of 2012 and asked, "Can we build an app for biologists?" And the simple idea that occurred to me was just it would be useful to me if there was a way, that as I'm doing an experiment, I could have a sort of checklist, a GPS to see what step I'm on and what I'm doing next, and if I change anything, to be able to record those changes and go back to them months later when I need to review how I did the experiment. It was a very simple app that I proposed for the iPhone, started writing down the specs. We're going to build it on the side.

And then three weeks later, I called my friend back, and I said, "Wait a second, if we did this and scientists were loading their protocols and using them to do experiments and keeping track of changes, could we give them a share button, a publish button, so that they could make those edits, tweaks to the protocols that they use public? Could we create a sort of central repository, a Wikipedia of science methods, crowd sourced, open access repository?" And that was really back in January of 2012. That was the beginning of the company.

**Chris**: Nice. So you've built a tool where researchers can share and modify their protocols and the benefits to... Let's just go into the benefits for what the researchers are and possibly for vendors looking to build apps or take advantage of apps.

**Lenny**: The reason I left the academia, the reason I've been obsessed and so passionate about this is because we're scientists when we're doing the research. We're constantly tweaking the methods, right? In the particular strain, in the particular cell line, with the particular conditions of what I am studying, we always need to tweak the methods that we

use. I'm not even talking about method development. When you're doing method development, that's all you're doing to get something to work.

And my experience in MIT was that I spent a year and a half tweaking a single step of a published Nature Methods protocol, and it turned out that a single step of it was incorrect. Instead of one microliter of an enzyme, I needed five. And instead of 15 minutes in a test tube, it needed to be there for an hour. And the crazy part is that there is no infrastructure, there is no way for me to communicate this discovery to anybody else is who is using this method, because it's not a new technique, but a correction of something that's previously published. And I can't go to Nature Methods and put a little poster on Step 17, telling everyone to be careful there. The real problem that this is solving for a scientist is that we're all tweaking methods. We all have this tremendous knowledge. We've tried a million things. We've optimized the protocols we were working, but we are not communicating it to the broader community and everybody is reinventing the wheel and hast to make these optimizations, be novel every single time.

**Chris**: Right.

**Lenny**: That's what we're trying to solve.

**Chris**: Nice. Let me, just as a follow up to that, you're building this repository. What is the risk that now there are numerous variations on a single protocol, how does someone know which one they should be using?

**Lenny**: That's a great question that we've been thinking about for three years, so it's all in the way that you implement it. And this is why some of our partnerships in the beginning phase, the content that we get, the protocols that we put in at the beginning make a great difference. And exactly as you pointed out, it would be much more challenging for us if we had 300 people come in and independently contribute a variant of a single technique, say Western blot, and then we don't know what are the changes, how the independent submissions relate to each other.

So what you want to do in order to do this well is to first seed the repository with the most common methods. You want the protocols that everybody uses to be already there so that I don't have to put in a new one, but I can just take something that's there, click “version” on it, there's a forward button, clone it, for molecular biologists you clone it, you modify it, and then you publish your branch, but it becomes -- you already have the tree -- and these just become branches. It's easier to tell what are the modifications. You can look at the original protocol on our site, and you can tell, "Oh, step six has been modified in all these different ways by all these different researchers," so it becomes easier to discover, on the master protocol, what are the things that people are changing.

And then for the individual versions of a given technique, you can see there are metrics. You can see how many people they're using this version versus another one, how many people are using the master protocol to do their experiments, and how many people have bookmarked and they're running on their app a particular version. The best way to discover this is through the adoption metrics in our opinion.

**Chris**: So it's somewhat of a like button, if you will, right? I mean you can...

**Lenny**: Right, it's not a popularity contest, but there's a lot of information in which forks people have been adopting.

**Chris:** Right, and can you tell which ones they've not just downloaded or whatever but which ones they're actually using?

**Lenny**: That's exactly right. There is a dimension here that previously just wasn't available, right, which is information about what is being used, what is being run. It's not citations.

It's not "We've published it and are citing this method." It's actual use of the method or particular branch version of it in labs.

**Chris**: Nice. And so let's talk about using this thing in the lab, because this is the question that has come up frequently, a couple of concerns around smartphones or tablets in the lab, and those range from just logistical challenges of worrying about solvents and so on to data security. So how do we get around those kinds of things?

**Lenny**: Another excellent question. We've had many of those questions, but we've been around for three years building mobile apps, so we have a lot of Google Analytics. We know that scientists are using the apps. It might be on their phone. If they're working in the lab where you're not necessarily handling dangerous chemicals and you're not afraid of contamination on your phone, but very often, you just get a used phone, you get a lab phone, it's like getting a calculator for your bench, right?

**Chris**: Right.

**Lenny**: Eventually, it just becomes a piece of equipment. We're okay buying tabletop centrifuges for $10,000. So if you have a really good app that makes it easier for you to do the work, then spending $50 on a used Android phone or a refurbished iPhone is really not a big deal. There are companies that have iPads on all of their benches, so it depends. And that's not it, the actual device we know that people are using and it is helpful and people do like mobile in the lab. We have lot of statistics on that. We do know that.

As far as security, it's run on Amazon servers. It's encrypted. We're actually starting a pilot with a pharmaceutical, I can't talk about which one at this point, but as long as it's secured from both sides and they look at your security compliance if they're happy, they're happy. There are clearly some biotechs, there are some pharmaceuticals that will be less comfortable with the idea of using something that's in the cloud, and then you might need an onsite installation deployment to call the silo installation, but that's possible too. Ideally, we'd like to avoid those. But so far this really hasn't come up as a huge issue. As long as it takes security seriously, you're no more likely to have security breaches just because it's on Amazon, if you do it correctly, than if you're running it on your own servers. We all remember a hack into Sony.

**Chris**: Right. Yeah, one server, theoretically, the same risk as another, to a degree.

**Lenny**: Exactly.

**Chris**: That, of course, answered my next question was about the data being stored in the cloud, so if someone walks out of the lab, even if they can't access what's in the device, if I get a new device, I can get back to my data, right?

**Lenny**: That's right, you can be at a conference talking to a researcher and you can take a look at how you did the particular experiment or the notes in your account.

**Chris**: Yeah, I didn't even think about that.

**Lenny**: You could be on the bus, preparing for a lab meeting, you could be traveling, so there is a beauty to their access when it's in the cloud.

**Chris**: Right. I think we have a pretty good idea of how this works now. Let's sum out how companies benefit from this simple idea of keeping track of what a scientist is doing in the lab. What can I learn if I'm a company and people are using my products in a protocol?

**Lenny**: Before the marketing, before answering that question, I think it's important for me to point out something that was actually a huge surprise to me as we're building the repository, as we approached publishers, I thought that we are offering a tremendous value to academic science publishers in that we were saying, "We will create a section for your methods. We're not taking your papers, but if you give us the method sections of your protocols of the papers that were published, we can share them online and we'll point right back to you, to your paper, and your method is no longer just a piece of paper or a PDF. It actually becomes alive. It's usable by the scientist as she's doing the research. Isn't that amazing? And on top of it all, the corrections, all the optimizations, we will give right back to you free of charge. We are an open access platform. It's free to read. It's free to publish.

That's not our business model. We're not a subscription publisher. And we'll give it right

back to the publisher," and we thought there's so much value that we're offering that they would just jump on the opportunity.

And most have been very resistant to this idea, it turns out, because it doesn't help them with extortion practices with librarians. It doesn't help them increase subscription revenue in any way. In fact, some of them are afraid that having even parts of their papers appear elsewhere in open access fashion might lead to librarians dropping subscriptions.

One of our biggest surprises was we offer all of this to the publisher and the publishers have been resistant. And that's very different -- I'm just getting back now to the value to the vendor. It's very different from the relationship we have with a lot of vendors who have been much more open, much more supportive than the publishers. They're just as for profit, right? This is not some philanthropic enterprise. But what is interesting is the vendors, their business model is aligned with the scientist in a crucial way in that they're not selling the protocol that comes with the reagent. They're selling the reagent. And if the reagent or kit doesn't work in the scientists hands, the scientist is less likely to reorder that reagent. So the vendor has high interest in making sure that the brochure, that manual of the protocol that accompanies the kit works and is as detailed, is as correct and useful as possible.

What they love about the platform is they can add their methods to protocols.io, and we give right back to them all the annotations, all the forks, all the improvements to what they published. They're not necessarily improvements, but it just can be “in this strain of the mouse, 30 degrees is best, but in a different strain, 35 degrees in this step is best.” And it's important for them to know this and share it with the scientists. I think the first essential value to the vendor is the fact that we are improving the methods that accompany the reagents that they're selling.

**Chris**: Right.

**Lenny**: That's the first part. And then from the marketing perspective, there is just a host of metrics. We're very careful to make sure that there is privacy. We're not sharing emails.

This is not a spam engine where we're letting a vendor just bombard a scientists with advertising. We're not pushing reagents. We're very careful about the integrity of what we're providing to the scientists, but there is a lot of information that you can learn from protocols.io, from what's being made public from the usage that I don't think exists anywhere else.

One example is if you're a vendor, you're selling reagents, some of the reagents, you know what they're being used for. They come with a protocol. Some of them, you don't have a method that accompanies it. You sell it, there is demand for it, and you don't know in which techniques, for what purposes that reagent is being used. Now if scientists are putting in

their protocols and including which reagents they are using and making this public, we can provided a report to a vendor on what are all the different fields, what are all the different techniques that scientists are using with this particular reagent. That helps your product development. It helps your marketing department. It helps you target just by knowing where it is being utilized, so this is one example.

Another example I like to give is if you have a kit that is no longer selling, it's a pretty easy decision to discontinue it. You have information. But the harder challenge is, if you are a vendor, what are the new kits that you should be building. How do you know which techniques are rapidly being adopted in the community? You can go to conferences and talk to people or you can wait for citations to particular methods to start accruing, right? As people start publishing and you see oh, this is a new technique that has spread quite effectively, maybe we should make kit for this given the amount of demand. But citations have a huge lag, so it's beneficial to be able to look at methods in real time and see which ones are being downloaded and used in the lab, which ones are being commented, which ones are being forked in real time before anyone even starts citing them.

**Chris**: Excellent.

**Lenny**: Basically what I'm trying to say is there is a dimension to the use of the method, which is very different from citation of the paper, that there is information that is valuable to the vendors from protocols.io just based on what scientists are sharing, making public, and how they're using the products that are there.

**Chris**: Yes, and so you said, of course, a vendor can get data on, let's say, my reagent is used in a particular protocol. Is it possible to send also data on other protocols the same person is using that doesn't include your reagent, maybe an opportunity for some adjacent product? You're saying the people that are using this product, a lot of them are also doing this other technique. We don't have a product there but we could.

**Lenny**: Right, this becomes a tool for market research.

**Chris**: Right, so can get that data? Can they say, of the people who are using our product for this particular technique, what does the landscape look like for all those people in other applications?

**Lenny**: We haven't built that up yet, we're just developing the vendor side of the platform, so a dashboard where you can comment and you can look at the analytics. And we're working with a few vendors with the marketing departments, they are telling us what's useful to them, so it's not.... This is something we're still building. The first challenge for a platform like ours is to get the content, to get the users, to get information that's going to be valuable. That's what we were doing over the last three years. And we're now only in that

phase where we're developing, figuring out what exactly is information for the vendor that is super valuable. What you're describing is very doable. We haven't implemented it yet, but these are exactly the kinds of things that we'll be providing to the vendor.

**Chris**: Got it, nice. I think that answers all my questions. I'm wondering, is there something else that you would say that companies should be thinking about as they approach app development or considering adopting a platform like yours? “What did I miss?” is what I'm asking.

**Lenny**: These were excellent questions. I don't think you've missed anything. And of course, this is a very biased perspective that I'll share, but the only thought that I can share as far as development internally, there are some really good things that occasionally come out from vendors, but my perspective on this is, just like publisher's, vendors aren't experts in software development. Their forte is not mobile development. I think we've seen a lot of apps that have been built just haven't been necessarily all that useful or all that good or on the cutting edge of what mobile apps, good user interface, what they should look like, what people are expecting, just because reagent vendor is an expert in creating the reagents. A publisher is an expert in publishing content, but it's very different from creating a platform or creating an app.

And I think a very self-centered, self-promotional perspective, but I would argue a correct one, is that there's a lot of opportunity for here partnerships with companies like protocols.io and many others that create the platforms that we live and breathe, we live and die with how good the software is. There is nothing else to us. If we don't get this right, we fail. So we're constantly talking to the scientists in the lab. We're getting feedback nonstop, and we are refining the user experience. And I think it makes a lot of sense to partner with a company like ours instead of just trying to create the software in-house. In a similar way that I would say we don't have the expectation that the taxi in limousine commission will build Uber. We don't expect Hilton to create AirBnB. There is a space for startups. There is space for companies that are experts at platforms and software development. And there's a lot of opportunity for partnering rather than just creating it in- house.

**Chris**: Yes this came up in a podcast I did with Johannes Amon a couple weeks ago, from Zeiss, and they partnered with somebody. And the other thing to think about is that an app takes on a life of its own. It's not create it, put it out, and be done with it, right? There's continual development and updating and as he described to me, every time Apple releases a new operating system, they have to go back and check and make sure it's working and doing all those things. So it's really an ongoing thing that has a life of its own. I've seen apps, when I was doing the article that I originally interviewed you for, I looked at reviews on

apps and some of the comments were "It hasn't been updated in a long time," and that's a big problem. People stop using.

**Lenny**: That's absolutely right. If you want to be successful in this mobile space, there are operating systems. There are different phones that appear, especially if you're working with Android. And you constantly have to be getting the feedback. You constantly have to be fixing bugs when operating systems are updated. But even beyond that, I would say, I would make and even stronger statement, it's not just fixing bugs and releasing versions to make sure it still works. There is an expectation from the user. There might not be a lot of great mobile software for scientists, but they're using other apps. They're using Uber.

They're using the weather app.

**Chris**: Yes.

**Lenny**: They're using Twitter. So they have an expectation for what the user experience is like. There is an expectation for the quality of software that they are willing to have on their phone. If you don't have the resources and the commitment to keep with the state of the art, it's just going to go stale and you won't be able to keep up with it.

**Chris**: Yes, that's excellent. So you're not competing with the apps your competitors produce. You are competing with the experience that any app maker can provide at the very highest level.

**Lenny**: That's exactly right, just saying that apps for scientists are shady, so I don't need to think about the user experience and the interface and the graphics on mine is incorrect.

Your competition is not other science apps. Your competition is everything else that scientists have on their phones.

**Chris**: Right, and that that's the world we live in, which is great. I mean it raises the bar for everything for us.

**Lenny**: It raises the bar. It makes it harder for us. It means we spend more. We have to pay more attention to this and try harder, but I think ultimately, it results in a much better user experience.

**Chris**: Excellent. So we've talked a lot about what you do and your business. Where can people go to find out more about you and protocols.io?

**Lenny**: I don't think there's a particular good reason to find out more about Lenny, but if you just go to protocols.io, you can get to the mobile apps and you can use it online, and I very much encourage everybody to take a look it. And this is a resource, crowd source resource, so if we don't have the crowd, if people aren't sharing, then this won't work. The

more people put their protocols in, and share the knowledge that they have, the more of resource this becomes.

**Chris**: Excellent. Lenny Teytelman , thank you so much for this fabulous interview, a lot of great information. I know that my listeners are going to really appreciate it.

**Lenny**: Thank you so much, Chris, for the opportunity. Have a good evening.

**Chris**: You too. Bye-bye.