



## The COOK Report for February 2018

### Introduction

On January 18 2018 the Cook Report interviewed two members of the arch econ list. one an old hand the other Isfandiyar Shaheen from Pakistan and a vc working in the wireless world at Facebook.

We offer the following look at what we believe is a very informative overview of a rapidly changing world of the technology and economics of IP networks.

**Cook:** The first question I have for Isfandiyar is how did you get involved with wireless?

**Shaheen:** I was managing a private equity firm in Pakistan in 2014 -15 and at that time I was thinking about the problem of how to minimize food wastage in Pakistan. For context, one fourth of Pakistan's GDP comes from agriculture. Almost half the labor force is employed by agriculture and about one-third of our agricultural produce goes to waste every year because of insufficient number of temperature controlled warehouses located around the country. So that was my starting point and I started thinking about where can I find a number of distributed assets that have access to power and are located around the country?

At that time I had a colleague who had a background in telecom and he pointed out tower sharing as a viable business idea for us to consider and that tower sharing was similar to shared refrigeration services. That got me thinking about infrastructure sharing at a more conceptual level and helped me observe that the wireless operators in Pakistan had in many cases over constructed cell towers. It was very common to see three or four cell towers constructed right next to each other even though even though operators could simply share one to begin with. It was an incredible waste of resources. Just to give you some numbers behind the waste, Pakistan today has about 40,000 towers and most tele-

com experts agree that had mobile operators shared infrastructure we could have achieved the same level of coverage that we enjoy today in Pakistan with 20,000 towers. One tower will cost anywhere between \$50,000 to \$100,000 so between one to two billion dollars could have been saved and deployed elsewhere. This is how the whole conversation started and I started realizing that this wasted excess infrastructure is part of the reason that cost of connectivity is so high. With that thought, I started digging a bit deeper into the fact that mobile operators in Pakistan had been talking about tower sharing but had not done it as yet. So with this backdrop the investment group that I worked with got convinced that making a tower sharing company in Pakistan is a good idea and that's basically how I got involved. In 2014 I started helping build this company called Tower Share that involved raising capital, recruiting executives and making a strategic plan on how to acquire these cell towers. That effort culminated in Tower Share taking over 13,000 cell towers from the largest operator in Pakistan.

But then in the process the early-stage shareholders including myself also ended up getting acquired by a much larger tower company called Edotco. So in brief, that was the last three years. During my time with Tower Share, I made Tower Share enter into a collaboration with Facebook through something called the telecom infrastructure project which is a Facebook led initiative to build better industry collaboration in order to drive down the cost of connectivity. Since then I've been a lot more engaged I've been investing a lot more time and energy figuring out how do we get to a world where cost of connectivity is so low that every human being alive can afford to access the Internet.

**Shaheen:** MNO stands for mobile network operator. That's basically your Verizon or AT&T, your Telefónica, your Deutsche Telekom. These companies are called mobile network operators and that is the acronym for MNO.

**Cook:** I think I think we're down to the question for Matt and that's how did you find out about the way in which your business model might fit into that of Isfandayar?

**Matt Larsen:** Isfandayar had come across me because we applied for an experimental license in CBRS so he sent me an email and we had a couple of phone conversations. As he started explaining about the shared infrastructure I felt like that's something that would have a tremendous impact for small operators like myself. We struggle a little bit with towers and we actually operate a lot of our infrastructure right now like a shared environment. The majority of the structures that we have our access points on are grain legs or little two-way radio communication towers or rooftops. It is a very opportunistic view of places where we can put antennas. We have exactly the same problem in the United States that they have in Pakistan, but it is probably worse. I would venture to say that we have about four times as many towers as we need but all of the different providers have a vested interest in keeping access to those towers locked up so it's just them that are on it. They look at that as a competitive advantage. So now you've got situations where companies like Verizon are actually selling off their tower assets into other companies that

just own towers because they want to maintain them. Then there are others like our competitor Viaero Wireless where the guy that owns the cell phone company started out as a tower owner so he goes out and builds all of his own towers and then his cell phone company rents from his tower company to be on his towers and if we approach them to try and get on the tower the rent is just ridiculously high. None of the other cell companies will pay to rent space on his towers and it's too expensive for smaller operators so a lot of times the alternative providers are locked out of this vertical real estate.

What Isfandayar is talking about is having the community put up the structure and then they could rent capacity on the structure to Verizon or T-mobile or whoever wants to pay rent or they can also rent it to somebody like us that would enable them to get another another competitor into the area to deliver that service. That would help a lot because a big part of our struggle as a fixed wireless operator is having to go out and find that infrastructure that's out there. We have to go out and build our own in a lot of places. We developed our portable towers to go out in places where there's nothing. This is a situation where you could get neighbors together or a community could put in some infrastructure just like you put in a sewer line or just like you put in a street. Put up a tower and then turn around and rent capacity on that tower to communication providers to be able to deliver broadband. It makes it a lot easier for us because, if I have an existing tower to put stuff on, I can do that very quickly. If I have to do all the engineering to figure out where we're gonna put it, work out all the details with the landowner, work out the lease with the landowner, work out getting power delivered to it, work out getting fiber trenched in, then it turns into a months long process. If the community has got this stuff lined up ahead of time for us and started going out potential providers they could say "Hey, we've got towers for you. Come on in we'll get you hooked up."

That's the sort of thing that would really help drive broadband delivery and adoption. Not just not just in third world countries, but even in our country as well. This doesn't have to be a rural thing. It could actually be an urban thing as well. If you look at urban real estate, there is a lot of underserved areas in our urban cores that with the right access to rooftops and a few strategic places you could deliver fixed wireless in that kind of environment.

I am telling people I'm going to write a new paper about the digital divide and it's going to be about how the cities are not going to catch up to some of the rural areas because places like Scottsbluff, Nebraska have better infrastructure than Denver. There is a member of my race car team that recently moved to Scottsbluff from Denver. He lived in one of the ritziest areas of Denver and he couldn't get the quality of connectivity there as he can in Scottsbluff so it was more favorable to him for him to move here because he's got better options in Scottsbluff, Nebraska than he has in Denver. So I think we're gonna start to see places where you *have a reversal of the digital/urban divide where some of the small towns and rural areas are going to have better connectivity than a lot of our urban core.*

**Cook:** Well, I think of two things when I hear this. Number one, Kansas City with William Wells and the 50 years of racial discrimination there and what William is determined to do to overturn that. He's working with children in the school system all the way from grade school to high school to get them versed in robotics and they enter the NASA, and International robotics competitions which they win. But also Kansas City has been a Google hangout, no pun intended, and that was the first city where Google put fiber in. But it really hasn't done Kansas City much good as the city still has a horrible digital divide. Now William has gotten his own fiber and is in the midst of tuning up that system that will involve wireless as well. He has 500 megabit connectivity and is paying \$100 a month for that, but soon he'll have gigabit connectivity for a hundred bucks a month which beats the hell out of Google.

**Larsen:** The one thing is it depends on how he's getting that connection. He should look at his Terms of Service very carefully because I'm guessing that's not for resale and he probably won't find that out until he starts putting people on it. If it's a commercial connection he might be okay. I know when I buy commercial connectivity from a company like Zayo it's in the thousands of dollars a month for gigabit, not a hundred dollars a month.

## **Guifinet**

**Cook:** The next question is how did you discover Guifinet you said just like I was searching for Vistabeam when I was searching for community wireless networks and through that search I came across Gufi and what was wonderful to me was through my mail list you found out that Ramon Roca the founder of Guifinet was there.

**Shaheen:** Yes! And I spoke to him two days ago so that was also really great. You know, that's what I love about being connected right now. It's a pretty empowering thought that those who have a smartphone and an internet connection have more information available to them than John F Kennedy did when he was President. So here's a guy with very little connectivity and yes he's president of America and he says I'll put a man on the moon in ten years. If you think about the resources that we have today they are on par with a guy from a few years ago who was at the time the most powerful person in the world. We are all powerful with all this computing power and connectivity!

I want to tie in one point, to add on to what Matt said. One thing that Matt said that really resonated with me when I spoke to him for the first time was that there are seven towers that are pretty much empty owned by American Tower in my town but its impossible to work with American Tower. These are Matt's words and for me that is problem to crack. We have to understand that American Tower or for that matter any tower company, is not evil and nobody is bad . It's a matter of incentives and the way these incentives play out. The that the starting point of a tower company or an infrastructure sharing com-

pany is that they will raise lots of capital usually in the hundreds of millions of dollars from equity investors to whom they will promise certain returns and they will raise debt in order to put this deal together and in this deal tower companies will lock themselves up in an innovators dilemma because they will only want to serve other larger customers even though those larger customers that they want to serve are not on a very stable footing long term.

If instead of a big tower company, imagine a small landlord living in Matt's town owning three cell towers. For that landlord the additional revenue coming from Matt's ISP will be significant enough and his incentives will actually cause him to develop revenue streams from the likes of Vistabeam and that's the part which needs to be looked at. How do you disaggregate this tower company or rather how do you disaggregate infrastructure such that the resources that assemble together can overcome this fundamental innovator's dilemma which really is a function of promises and incentives. When a group of entrepreneurs raise money to build a tower company, they are telling their investors "Hey I'll deliver you a twenty to thirty percent return" and in order to deliver that kind of a return these entrepreneurs will immediately start chasing other larger deals as opposed to finding alternative ways of putting that infrastructure to better use.

This is where Gufinet is particularly interesting because there are right now over a hundred community wireless networks around the world and none of them have achieved significant scale. Gufinet is the oldest and the largest. It's been operating for 15 years. It's got 60,000 nodes and it is essentially holding infrastructure in the Commons. The big innovation that Ramon has done, according to him, is an accounting system that Gufinet has created. The way it works is that there is a finite cost to run infrastructure and we will split these costs depending on who is using how much.

**Cook:** That's a relatively new innovation that Ramon had added in order to weed out people who were in it for commercial gain to get the small guys that are commercial sharing infrastructure with each other and to reimburse them if you want to be provided by Gufinet. They reimburse them according to their contributions.

**Shaheen:** Exactly! See this is for me really important because like what gets measured gets done and then what gets rewarded gets done repeatedly. We are always going to follow whatever fitness function has been assigned to us.

Now, where Gufinet becomes more interesting, and this is the conversation I had with him on Monday, was that I said "Hey, if you take a look at the valuations of mobile network operators – Sprint, AT&T, Verizon, Telefonica, Deutsche Telekom – most of them have a situation where their enterprise value is less than the market value of their assets." Specifically this means the following - if I were to raise money to buy a mobile network operator today and I have decided to sell it in different pieces (meaning I sell the towers

to our company) I can sell backhaul network to a Level 3 or I sell spectrum to the nearest competitor available or to a private investor, I will make some money in doing this deal. But this also says that there may be some merit in saying “Let's buy a mobile network operator and run that operator's infrastructure the way Guifinet runs its infrastructure.” In other words change the incentives.

What the current incentives compel is to maximize returns to equity holders by selling voice and data services and do some other kind of digital innovation that the telecom industry does not quite understand yet. If instead this, you were to reverse direction toward maximum utilization of infrastructure, then we will operate this company in order to minimize cost of infrastructure access.

Can this become a fitness function for an infrastructure owner? That is the bigger question that I am currently posing to a lot of capital that is present in Silicon Valley that is looking to do good and looking for purpose. The push that I give to people in Silicon Valley is that if we don't end up bridging this digital divide we've got much larger issues. For me, I'm absolutely convinced that if we don't solve issues pertaining to the digital divide we will never achieve global coordination which is a prerequisite to solving much larger issues like climate change which we are definitely going to hit in the next twenty to thirty years and right now there is no plan around. If we want to have a fighting chance we have to bridge this and one way of doing that is saying *let's use our minds and hearts to figure out how do we change the existing system and that's how I came across Guifinet.*

## The TED talk

**Cook:** Well I'm thinking of two other points and one is you probably are not aware of who's on the list related to climate change and the other is how did Matt find out about your TED talk?

**Shaheen:** The reason I found Matt is I've been trying to deconstruct the mobile operator but by asking what does it cost to build a mobile operator or what do I need to build a mobile operator? I need spectrum, I need towers, I need backhaul, I need some tech and I need people. So I was thinking who's working on spectrum sharing? Who is working on small cell backhaul? Who is working on the various components that make a connectivity system? And there is this one piece of innovation that's about to get shot down in America, it's called citizens broadband radio service or CBRS which is basically spectrum that was owned by the American Navy and a group of companies came up with a set of rules through which the spectrum could be shared. **I was looking for companies that were trying to run pilots on a CBRS and one of those companies is Vistabeam which is Matt's company.** So I contacted him to learn more and Matt responded saying that they were playing around with it but he was seeing much more promise in small cells, which was interesting.

So I said “Thank you for replying, I'd love to talk and learn more about you and by the way this is my background - I am obsessed with this connectivity stuff and here's a TED talk that I've given as well.” *Matt and I had a few exchanges and he was really kind to introduce me to your mailing list.* Since then I've exchanged thoughts with Matt and that is how we are all here today.

**Cook:** Well what you just said about Silicon Valley brings to mind yet another person on the email list. I have a lot of wireless strength on the list, including Peter Ecclesine at Cisco. It used to be, if you have a wireless company that you wanted to sell to Cisco, you had to talk to Peter and let him do the evaluation of it. If he liked it then the big shots at Cisco would make you an offer and acquire you.

**Shaheen:** I'm so grateful for the quality of people you have on this list. I keep Googling each one of them and it's really incredible the people that you have assembled and the way that you engage them. Hats off to you, It's an absolute privilege to be to be a part of this.”

### **How then does accompany like Vistabeam deal with VC's?**

**Larsen:** I had a couple of questions to run by Isfandiyar since he has a background with venture capitalists. We've got a lot of different efforts that purport to be trying to resolve digital divide - there's Connect America Fund, Microsoft has a grant program and there are lots of state and local efforts but it doesn't seem like anything is really making a whole lot of traction. The largest companies in the fixed wireless industry that have venture capital behind them have not been very successful. I think the parameters of the private equity investors and the efforts to maximize revenue lead them to not do needed upgrades and they weren't able to adapt their business model to the conditions that most of the smaller fixed wireless ISPs operate under. What do you think it would take to get these things to align and work together? I think we could go a lot further toward resolving a lot of these issues but it seems like government wants to pour money into these big companies that they know that aren't really doing anything with it and the venture capitalists are trying to apply this top-down approach to it that does not really work on a smaller-scale. There are a lot of operators like me around that work on that smaller-scale, but we lack access to capital and can only do so much. Do you do foresee any ways that we could figure out a way to try and get values to align between the top-down and bottom-up approaches?

**Shaheen:** That's what I spend most of my time thinking on and I can summarize the diagnosis so far that explains why a lot of these efforts have not managed to deliver tangible results. It boils down to incentives and what some of these larger companies are measuring. To a great extent, a lot of these larger companies become victims of scale. What that means is that when it comes to thinking about how significant impact can be derived over the near term this is generally a tendency to talk to the bigger companies

that have scale. I'll give you an example - Pakistan for has a five million dollar Universal Support Fund which mobile network operators keep pooling into a joint pile in order to bridge the digital divide that never gets deployed and that's because you have not really created organizations that have taugt through the incentives and some of the early stage promises.

The second part that you talked about is the challenge that exists with venture capitalists that are looking for a substantial return in a small period of time. I think it's a similar issue where the conversations that generally happen upfront between entrepreneurs and investors involve expectations that have not been very clearly aligned. I think a good example to think about a company today without getting into a lot of detail is One Web. This is a company that raised a billion and a half dollars with plans to plaster the earth with satellites and it's got some pretty big ambitious plans. One can argue would that capital be better used if you were making a play at leveling the playing field - for making infrastructure more open access. I would argue that that yes that is true. But we see Silicon Valley continuing to spend more money on shiny technologies that are not necessarily relevant and I think this boils down to something much more fundamental.

As human beings we crave relevance. As human beings we want to talk about stuff that we know, stuff that gives us the ability to hold dialogue. Therefore I've seen a pattern where Silicon Valley entrepreneurs have a tendency to throw shiny technologies at a problem even when the problem is not necessarily requiring a shiny technology. One of the reasons I wanted to move here was to say we definitely have this issue with relevance. Perhaps the starting point has to be finding thought partners with whom values are aligned, make sure that the thought partners are sufficiently diverse in terms of experience level, in terms of the geographies they come from, in terms of the experience that they have and talk to capital providers with a very different set of expectations.

When I talk to capital providers here I tell them I don't have a business model, I am NOT going to deliver you immediate returns but you know that we need to make this intervention happen if we want to survive the next century. Now let us think about what is the minimum possible cost that it will take to bridge this digital divide. There is a number that gets thrown out which is 450 billion dollars and I am saying we can do better than that. Let's start calculating what will it take, what interventions will we need to do where will we need to use our collective brains in terms of working with regulators, in terms of doing deals to enable smaller companies and that's where I find myself.

### **What use do we make of the wealth of our new Guided Age?**

For me, I continue to wonder about all the incredibly wealthy people in this world who have made these giving pledges that they want to give 99 percent of their wealth in their lifetime. These people are also struggling to deploy capital. I'm giving you a long drawn-out answer because it's not an easy one to answer but the fact is that for companies



and for individuals, timing becomes very critical. I've observed a few things with capital providers and it's generally true for human beings - in the year that a capital provider has made a lot of money, that's the year that they start becoming more generous and more inclined to do certain things. In the year that a new investor takes ownership of a company is the year that that company will want to do some things and overcome its inertia. These are interesting insights we can use and things that I try to rely on. For example I have identified a fairly wealthy guy here who's run into some more money recently and he's the one I'm pushing to say hey let's buy an operator but let's not buy an operator with the intent to make it the largest operator in the world, let's buy an operator with the intent to minimize cost of infrastructure access.

There is value in this model because the world needs it and if we prove it and can scale it. If this is not a viable business model starting out, let's think about how do we make it viable and for that we need to think about other people's incentives. We need to think like just for example your CBRS trial should have been financed by a university that cares about spectrum sharing. So the question is so how does Matt go about finding universities that are interested in spectrum sharing? With so much connectivity, transaction costs have fallen low enough but somehow these connections aren't happening and I guess it begins with dialogues such as the one we are having.

I think between me you and Gordon, we're pretty diverse right now. I have come from a very different world, while you're living in Nebraska and Gordon is in New Jersey.

**Larsen:** My other question had to do with market control. Obviously, living here in Nebraska I'm not an insider, but my first job out of college was as a commodities broker so I got to see a lot about how markets work and how big entities push their way around. I feel like a lot of what is holding us back, in fact probably the biggest factor in our digital divide and why some areas are doing well and others are not is because the big players are actively doing everything they can to protect their markets and maintain their monopolies. I feel like there should be a way to hasten the demise of some of the dinosaurs. I wouldn't say Verizon is one of them, Verizon is actually fairly progressive. I feel like Comcast is fairly progressive compared to some of the other entities I've seen when I go out to interact with people in BITAG and in a lot of the discussions that I have. But consider companies like CenturyLink. I would have been shorting CenturyLink stock over the last 10 years as much as I could.

I don't understand how they continue to stay in business. Yet, they could generate the money to go out and buy Level 3 when their operations are just it's a disaster. *I felt like we've been months away from seeing a company like CenturyLink just completely collapsing on itself. What do we do to hasten their demise?* And how do we break some of the power structures like even the shared infrastructure? If we get too much unlicensed spectrum it devalues the existing licensed spectrum holdings of the MNOs, and what's the biggest percentage of their balance sheet right now? Spectrum Holdings! So I'd be curi-

ous to see if you have any thoughts on what are some ways we might be able to break some of those monopolies, open the dam up and watch the flood happen afterwards.

**Shaheen:** I have theories only. If there was a highly liquid marketplace for bandwidth, where you could trade bandwidth when it comes to backbone and backhaul, something like where internet exchanges and the Zayo's and Level 3's are be doing their deals - if you could bring something like that to last mile and access markets I think a lot of the inefficiency is would start getting resolved.

You have exactly hit the nail on the head that a lot of these companies are anti-competitive. If you look at maps between particularly in North America or in United States there are these little priority markets that you know cable companies have made and they've just split it up - aka I won't come here you won't come here it's pretty much operating like a drug cartel. So how do you split it up? I would say very old-fashioned Wall Street way would be you go in with a plan to buy a Century Link and sell off its assets to whoever will be the better owner of assets. I can tell you these deals will come soon, because valuations of these companies will continue to fall but the relevance of infrastructure such as fiber and tower and spectrum will not go away. More people such as yourself will find a way to put them to better use. So I do see some sort of trends happening automatically. How that can be accelerated? That's one of the things I try to work on here.

Can I raise capital to break apart one of these entities and figure out a better way of operating it? At the same time we should be looking at more scalable bottoms-up solutions which are literally something as simple as going to all the rooftop owners in America and form a rooftop owners cooperative/association which will operate under the principles of open access. On these rooftops we set up steel structures or some kind of structure based on input coming from the 7,000 ISPs that are currently present. Then, if you knew there were seven million rooftops in America that became accessible and you were not requiring five-year contracts or very large balance sheets to be used all of a sudden there is a major competitive advantage that starts shifting in favor of some of the upcoming companies such as yours.

To answer your question it's obviously a combination of grass root efforts, thinking about the role that private equity can play and also thinking about the role that regulations can play, although right now I'm not too optimistic about the role regulations will play in America. The way regulations are shaping up in America it's going more toward supporting centralized entities that have well-oiled machines that can basically go to the state capitals and do the lobbying, so I don't see a lot of support coming from regulators at present or at least until the next election - and then we don't know what happens in this country.

**Larsen:** It's too late. Regulation takes so long to work through here. When I meet with people I've told them my entire business is a regulatory bypass as much as possible.

**Shaheen:** Yeah, I know. But I want to give you an like an example how despite regulations things happen here which have inspired me. This is a brief story for Gordon. 60 miles north of San Francisco which is a small town called Dillon Beach, California. Dillon Beach is a town of 1,400 people that did not have internet access until 2014. So what changed is that there was a guy whose daughter had turned 16 and she was running from Starbucks to library looking for some kind of internet access. To cut a very long story short, this guy figured out a way to lay his own fiber connected to AT&T's fiber and now he is distributing internet using mimosas routers to 158 customers. He's pretty much built his own little ISP using plug-and-play equipment. Now equipment is becoming more and more plug-and-play it is also becoming a lot more power efficient. As these trends continue there is definitely going to be a decentralization of ownership operations and maintenance of Internet infrastructure because there is no way that a centralized entity can maintain and operate Internet infrastructure more efficiently than the person who lives there. So the natural solution is going to be decentralization and disaggregation. I do think that needs a push and some of the things that I try to work on which is part of the reason we connected as well.

## **The Founder of Visa**

I think it will one other bit I want to say is since you asked about how do we get this done. I had the amazing fortune to talk to the founder of Visa Inc. There's a gentleman named D Hawk and I know this man built Visa and I read about him and wrote him an email and he replied and he's like "yeah let's talk." And what was really amazing about that conversation is he said the story of Visa the way it's written on the Internet is not all the truth. The truth I want to tell you is that at the incumbent which was Bank of America did everything in their power to block Visa from getting established and D Hawk used to work for Bank of America at the time. So what he said was "Look, you're well-established players" - which is our large mobile operators and large telecom companies - "and you are not going to change the status quo. You'll have to band together with people that are actually hurting and think about this problem every day." So his big takeaway was that it was only when a group of small regional banks decided to pull together their network is when the larger banks decided to join the Visa network.

This example is relevant because Visa is an example of an entity where competitors agreed to cooperate by creating a Membership Corporation in which they pooled together their infrastructure and essentially operated that entity to minimize the cost of a transaction. Now why can we not create a Visa equivalent in the telecom industry? Independent networks give a comparative advantage to those who have access to capital so that's one I thought was an interesting tidbit I wanted to share.

## **Chaos and order**

**Cook:** I had a question. You and Ramon have exchanged messages on the mail list he refers to the word “chaord” and you understood. What does that mean?

**Shaheen:** Its a term from D Hawk, its called CHAORD, which comes from chaos and order. Hawk is the founder of Visa and he's a pretty idealistic guy. He has written a really interesting book about his experiences.

## **Facebook’s reputation**

**Cook:** You are working with Facebook and they obviously have a number of efforts they are doing that are quite progressive. I just wondered is if Facebook has the kind of venture capital operation that ordinary street people never hear about. Would you comment on that?

**Shaheen:** I've been very pleasantly surprised with the type of people that I've met inside of Facebook. I find that more and more the voices inside Facebook are demanding a convergence toward publicly stated ideals of of open access, transparency and a more of democratizing access to technology. As far as the company itself is concerned, they talked to me about joining full-time, but I had a preference for working part-time because I felt I could do more. Also, with the other time I had more flexibility to engage directly with with people like Matt, but at the same time because it's so pervasive I think it's also really important to understand that machine, understand people inside that machine and what are they currently thinking, how are they incentivized, what are some of the challenges that they face.

Like any other large organization they have their challenges and like any other large organization or society they have some extremely idealistic well-meaning people that genuinely intend to do good in the world. Now where things start becoming a bit tricky is frankly a more philosophical question which gets into topics related to freewill and consciousness. *One of the big things that really happened in the last couple of years was this realization that if you've done 50 or more likes on Facebook, that algorithm knows you probably better than you know yourself. And now this is where things start getting tricky. When you start thinking about how easy it is to manipulate human beings and how easy it is to manipulate ourselves and that's a really large topic because then that gets into the realms of neuroscience and the fact that neurons start firing before we do a certain activity.*

I subscribe to this view to a great extent, that human beings are algorithms that are responding to certain inputs and over a period of time as human beings interact more and more with technology this results in data accumulation those. Technologies end up learning so much more about the human being and it's now gone into a point where it's starting to become a bit scary as well.

I don't know if you remember from a few years ago there was a really fun article which said that the company Target knew that a girl was pregnant before her father did and ended up sending her marketing materials.

**Cook:** Yeah, I remember that!

**Shaheen:** Remember that at that time it was an interesting data science problem about how we follow a bunch of patterns. Like our behaviors tend to change depending on the amount of sleep we've had, the amount of water we've had, you know the kind of general mind frame we're in. Now what's happening with technology platforms at Google or Facebook or any other hyper addictive technological forum is that we start volunteering a lot of information. This information is such that now it's out there and you don't have to be Facebook to access a lot of this information. For example, one of the companies that worked on the Trump campaign significantly is the company called Cambridge Analytical but the tools that Cambridge was using to really zoom in on users that are likely to play a very key role in key swing states is something that even you and I can use!

That information is out there - you don't have to be Facebook to view those trends. You can view those trends already and that's actually the more important question. I find people at Facebook to be equally worried and I would say my experience is pretty limited. There is definitely I would say a genuine quest towards creating a more just world, a fairer world. I remain optimistic about this whole situation because while today when you see the giants of present time which is Amazon, Google, Facebook - they're all 500 billion plus dollar companies, the fact is that the cost to launch a company is falling faster and faster and as transaction costs continue to fall people will figure out a way to self-organize and so long as that self-organization is rooted in sound values and is trying to solve problems that are actually in in our common interest, a lot of these issues that have started emerging today we'll start getting resolved so it's a long drawn-out answer.

That's part of the reason I decided to work with Facebook, because I felt that understanding it and the people inside it is actually very very important for the kind of mission that I am currently on.

The other important thing I want to tell you is I've been very open with them saying "Hey, I'm gonna work three days a week. Outside of work these are the things I'm working on and this is what I care about." They have been nothing but supportive in terms of the kind of initiatives that I've been trying to launch.

**Cook:** That's good!

**Just a quick PS:**

## What I learned from executing a 13,000 tower infrastructure sharing deal in Pakistan.

ISFANDIYAR SHAHEEN-TUESDAY, SEPTEMBER 5, 2017 66 Reads

I learned about infrastructure sharing while trying to understand why my country, Pakistan, wasted 1/3 of its agricultural produce every year. For context, 1/4 of Pakistan's GDP (\$300 bn as of 2016) is driven by agriculture and the Agriculture Sector employs ~43% of Pakistan's labor force. Through my research I learned:

- There was a lack of cold chain and cool chain storage infrastructure
- Where storage infrastructure existed, the assets were under utilized
- Sharing infrastructure could solve the problem, but a lack of trust between market participants made it difficult to expect collaboration

As I dug deeper into the issue of wasted resources and under utilized assets, I learned that the success of capitalism in terms of consumer choice ended up creating a high volume of "me too" products and services. Most of these "me too" products and services were built by [traditional pipeline companies](#), which still operated on an [obsolete premise of strategy](#). Examples included dairy companies operating milk collection centers located right next to one another but suffering from less than 50% capacity to utilization to multiple bank branches adjacent to one another offering an identical service but sub-optimal utilization rates.

The most glaring issue of wasted infrastructure was in Pakistan's telecommunications industry. In 2012, Pakistan had 5 Mobile Network Operators, 34,000 cell phone towers and a very high degree of overlap between those towers. Most telecom experts I spoke with said if the MNOs shared towers, the existing level of coverage in Pakistan could be replicated with only 17,000 towers. For context: one tower costs about \$75,000 to build, implying that the telecom industry in

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RINA will be a BIG thing and especially in Barcelona where Guifinet is. We talked about this and I very much would like to include it. It will ultimately happen and when it does the world will change.

### Some Urls from Isfandiyar

Slides titled Project Chaord (these are a series of observations I've made that I shared not a business plan deck)

What I learned from Tower-share (the past business I was with)

My [TEDx talk on internet for all](#) through infrastructure sharing provides a better sense of my motivations. To go deeper into what matters to me and why, see [this much longer post](#) on tools / metrics I've used to better understand myself.

Written text of TEDx talk plus slides

<https://medium.com/@isha-heen10/internet-for-all-through-infrastructure-sharing-7b611f1f2ba2?source=linkShare>

## Executive summary

<b>Purpose</b>	<b>1</b>	Enable everyone, irrespective of literacy level, to access knowledge contained in the internet
<b>Problem statement</b>	<b>2</b>	Making internet access affordable for all is not financially feasible for Mobile Network Operators (MNO) under their current organizational structure
<b>Solution and caveats</b>	<b>3</b>	Infrastructure sharing can reduce the cost of connectivity but also reduces barriers to entry from an MNO's perspective
<b>De-centralized effort example</b>	<b>4</b>	Community wireless networks like Guifi.net are significantly more cost effective and can scale faster if MNO owned infrastructure was "open access"
<b>Centralized effort example</b>	<b>5</b>	New age MNOs like Reliance Jio can under-cut competition because they are not held back by legacy infrastructure and archaic business processes
<b>Governance principles</b>	<b>6</b>	Visa Inc's governance principles can be applied to managing internet infrastructure better than status quo
<b>Phase 1 Objective</b>	<b>7</b>	Create a lab where cost reduction hypotheses can be tested and invite technology platforms like Facebook and Google to use such a lab
<b>Phase 2 Objective</b>	<b>8</b>	Acquire MNOs or MNO assets and help private equity funds predictably deploy capital to finance the exponential growth in data consumption