DECODING IMPACT

DECODING DIGITAL PUBLIC GOODS AND DIGITAL PUBLIC INFRASTRUCTURE WITH DR PRAMOD VARMA

June 2023

Acknowledgements

Contributors

This podcast was arranged by the **Digital Platforms Team** in Sattva Knowledge Institute and was hosted by **Rathish Balakrishnan.**

We would like to thank **Dr. Pramod Varma, CTO, EkStep Foundation,** for participating in this podcast and for contributing his valuable expertise, insights and time.

Disclaimer

About Sattva Knowledge Institute

Sattva Knowledge Institute (SKI), established in 2022, is our official knowledge platform at **Sattva.** The **SKI** platform aims to guide investment decisions for impact, shedding light on urgent problems and high potential solutions, so that stakeholders can build greater awareness and a bias towards concerted action. Our focus is on offering solutions over symptoms, carefully curating strong evidence-based research, and engaging decision-makers actively with our insights. Overall, SKI aims to shift intent and action toward greater impact by influencing leaders with knowledge. All of our content proactively leverages the capabilities, experience and proprietary data from across **Sattva.**

Introduction: You are listening to Decoding Impact, a podcast by Sattva Knowledge Institute hosted by Rathish Balakrishnan.

Welcome to Season Two of Decoding Impact. Every fortnight we will engage leading thinkers and practitioners to understand what it takes to solve systemic problems at scale. For all the curious changemakers committed to understanding the trade-offs and incentives to make this world a better place, this one's for you.
***

India is in the middle of a digital revolution. Digital Public Goods and Infrastructures, otherwise referred to as DPGs and DPIs, are at the forefront of this revolution. Given my own experience with DPGs, I have often recognised that the challenge is not in building the DPG, it is in imagining the right DPGs. How do we find that one component that once put in place, can unlock population scale value for so many people? How do you engineer and architect solutions that can work at scale? I had a chance to sit with Dr Pramod Varma, a true innovator and a leader who is the chief architect behind initiatives such as Aadhaar, eSign, Digital Locker, and UPI. And my greatest takeaway from the conversation was that simplicity is indeed the ultimate sophistication. I hope you enjoy the conversation as much as I did.

Highlights:

…In the history of humanity, we have had structures that were meant for public goods.

…I've always understood DPIs and DPGs from an entrepreneur's mindset.

…There is a significant mental model difference for the people who are builders of the DPI or builders of the infrastructure. So what success of infrastructure is not impact success, it's an adoption success and diverse adoption? Better.

…One of the biggest concerns philanthropy has built into its design in some sense is the risk of non-adoption.

…The infrastructure builders ask very, very basic questions.

…What is the best list of DPI thinking in India today?

…DPI thinking DPI commitment does not take deep pockets. It takes deep conviction.

…But I do also believe that there needs to be an entrepreneur for the infrastructure also.

…Digital India actually solves poor people's problems.

Rathish Balakrishnan (RB): [00:02:32] In the last few years, there has been an emergence of DPGs and DPIs to achieve population-scale social impact. 1.36 billion Aadhars have been issued and have been used for 82 billion authentications. There have also been 100 lakh crores of rupees of value transactions in the last eight months through UPI. In addition to identity and financial inclusion, there are multiple DPIs emerging across education, health, agriculture, skilling and livelihoods. So what will it take to unlock value from DPGs and DPIs as they emerge in other important and complex social sectors today? To enrich this discussion with his insights and to decode DPGs and DPIs, we are joined by Dr Pramod

Varma. He is the current CTO of EkStep, a not-for-profit creating a learner-centric technology-enabled platform to provide learning opportunities to 200 million children in India. Among his many avatars, he is also an advisor of national and global repute with a personal passion for technology, science, society and teaching. Pramod, thank you so much for joining us today.

Dr Pramod Varma (PV): [00:03:37] Pleasure to be here at this.

RB: [00:03:49] Pramod, one of my big goals for today's podcast is to build on the amazing conversations you've already had on videos, podcasts, on Digital Public Infrastructure and Digital Public Goods. But there are probably a few people who are joining us in this conversation for the first time. So if you can help us understand what a digital public infrastructure is, what is a digital public good? That will be a great starting point.

PV: [00:04:18] I think, first of all, these terms are somewhat new, and I think this is still being defined, frankly speaking. But I think there's been a reasonable, consistent usage of these terms in the last one year. If you look at it, the G20 conversations and other global conversations are cementing those definitions. To make it easier for everybody to say the same thing, you know, let's start from digital public infrastructure. Countries, as long as we had organised societies in the history of humanity, we have had structures that were meant for public goods. You know, whether it's roads, whether there's plumbing or water supply in, you know, ancient Rome or wherever. Right. You know, people have… so this is not a new concept for us. An idea of creating infrastructure, a shared infrastructure, that brings some sort of common access or meant for public usage purposes or meant as a public good in one sense doesn't mean it's free, by the way. A lot of confusion. A public good doesn't mean it's built by public money, but as meant to be a public utility meant for as a public good, for creating equitable access so that people, you know, reasonably balancing out of the people who have and the don't have, they are all able to use it commonly. And we see this all the time. And why do we do this? We always did this for creating equity, creating economic growth, enhancing access, access to water, access to education, access to knowledge, access to music. You know, we had public music programs or, festivals and so on.

A lot of these are actually meant as public infrastructure. But interestingly if you look at the railroads of the UK, you know, although, it might not have started with good intent; definitely it became a transport of economic activities over the rails. And in the 60s and 70s when the highway infrastructure was built in the US, you know, the US just propelled itself to that. And now China, if you look at massive infrastructure and India in the last few years have been also been pushing for dramatic enhancements of physical infrastructure, whether it's electricity as we were just talking about, or highways or, you know, better rail connections and better air is to create that economic activity on top of that. But when it comes to digital, early days of digitisation, we had universities like DARPA or defence research-related activities. The Internet brings out technologies that touch humanity at scale and the standards, bodies and so on worked on it. Universities worked on it, Defence scientists worked on it. The Internet is a classic example of a human-scale digital public infrastructure. It is not controlled by one company. If you get your podcasts, you have a lot of followers. You are king on the Internet. There's nothing stopping anyone, from anywhere

in the world to come to your website or podcast site and consume content. So the underlying infrastructure was decentralised, made available as a public good, a public infrastructure, for public utility purposes.

Not only that, on top of that, you then allow innovations to thrive. So when you create digital public infrastructure, you have to think about two things. One, is the creation of that digital infrastructure that sort of levels out the access and equity and builds to it. But also you have to consider the second point, the most important point that it is amenable to innovation further because that triggers exponential change later. And so we saw the Internet and we saw things like, you know, email protocol that allowed us to communicate over email. And then we saw GPS in 1999 when GPS was put out in the public domain, it became a public utility and actually became a DPI. And each of those DPIs did one thing very well but at scale. That Internet by itself. All it did was move information packet HTTP protocol and HTML packets. That's literally what they did. They didn't talk about how e-commerce will work, how we will have this podcast over Zoom. They didn't, they didn't come in the way of being opinionated about it. They said all we do is this, but very well, at scale and GPS said all we are doing is three numbers lat-long-alt, as in the third variable. All you are saying is here, this is the location of that particular object or a person. That's it. Nothing else on top of it. All such innovations are layered on top of it, and that's why it was unimaginable. There's a funny story that I mean, mostly stories. The guy who built GPS or was part of the GPS creation was flying and somebody was sitting next to him and said, "What do you do?". He said, okay, we are just creating something called GPS, global positioning, massive infrastructure. "What does it do?". It says, oh, tell you exactly where you are. The other guy looks, you know, thinks for a while and says, "I already know where I am. I don't understand the value of it at all". But, you know, this is why it's very hard to imagine all possibilities that will happen on top of a DPI, if designed well. So digital public infrastructure has that. But what is unfortunate, though, is that post 90s, the standard bodies or research organisations were too slow compared to the technology firms, mostly driven by the US. They were way too fast. So if you look at technology infrastructure beyond the Internet and GPS, the economy on the GPS, they are all private goods. They were not public goods. You know, if you look at Cloud, smartphones, and platform economy. The two-sided platform economy is like Uber, Amazon, and Airbnb. They're all private goods. Nothing wrong. They truly reimagine possibilities. They helped us reimagine how things could work, but it has its own negative effect that we are not building enough digital public infrastructure beyond the Internet. And digital public goods very quickly are just a set of passive assets that help someone else build DPIs. So if you have standards or software or knowledge assets that can be put out in the open source, it simply allows different countries and different jurisdictions to create their own DPIs faster, cheaper. Otherwise everybody has to create their DPIs own from scratch. And that doesn't make sense. So DPGs are just public goods assets that can be used to build your own house.

RB: [00:11:47] Pramod, I think, two thoughts that emerged from what you said and both of them I'd love to have built on, you know, from our conversation. I've always understood DPIs and DPGs from an entrepreneur's mindset because I always say that an entrepreneur is somebody who solves a problem in a way that is viable and effective. Right? It has to make

economic sense and it has to make social sense. And I've realised that entrepreneurs have a very low chance of success because they basically have to solve a lot of problems. Every time we build a good infrastructure, we make it easier for an entrepreneur to solve a problem. Imagine Ford had to build roads for them to sell cars, right? Or somebody had to create posts to actually do things and so on. I think a good infrastructure helps increase the chance of entrepreneurs succeeding. And when entrepreneurs succeed, the value gets unlocked. And for me, the intuitive thinking of infrastructure always is anything that enables problem solvers or entrepreneurs to succeed better because you create a ramp on which they can run is good for society. And digital public infrastructure is a great way to build ramps for more entrepreneurs to succeed.

PV: [00:12:55] This is the dilemma that, you know, we sometimes face. When you build infrastructure for new entrepreneurs, it sounds perfect. I always wished there were roads, there was enough capacity and all that. Now I can actually build the car, right? In this sense now it's perfect timing. Society is ready. The infrastructure is ready. I can go all out, which is what companies like Ford did on or, you know, Zerodha did on top of India Stack. And those are brilliant examples of that. So there is a disruption coming, and they start seeing the disruption coming. And so people who are incumbents find a little bit hard to reimagine. What else could they do because their mental model and the organisation DNA and their current revenue model derive from the current context and the current context, if you are trying to disrupt the current context is not fun for them.

RB: [00:13:52] And it is not and I want to come to that. You know, one is, as you rightly said, the mental model, which is what Henry Ford said, if I had asked you what you want, you would tell me, a faster car. You will mean a faster horse. You will never tell me about a car. But the second is they have built these modes which are helping them succeed. And infrastructure takes away those modes. Now anyone can drive there, which is, I think, important. So then the mode becomes something else, you know. So if everybody had ONDC, the best e-commerce company is going to differentiate and customer service not on logistics networks in some form. Right. And I want to address this innovator's dilemma. Right? Like what happens to existing incumbents and what are the tensions in there? But the second thing Pramod, which I think is the even more important point is that you made a road that is not designed for a certain type of car or a certain type of bike, a certain type of anything. It is designed for anyone to go. I feel that in social problems it's very hard to imagine a road model, right? Because everybody wants to build the road, build the car, build the passenger, provide the customer service and then run. And I've always realised that thinking on DPGs is thought of as a digital problem. Don't think it is a digital problem. It is the mindset problem of saying How do you imagine building a road and not the person who's driving the car? Because almost everyone who comes in the impact space mentally or subconsciously wants to be the person who is driving the car. Right. And imagine building the road as part of driving the car. Do you see that a lot in your experience as well?

PV: [00:15:20] A lot, not even driving the car. They want to be driving the car actually taking the lady from this place to the hospital and provide health care and actually make sure she's okay. Right. In the sense that actually has a true impact in, you know, an example where you are really, really helping someone change their life, which is good, which is very important to

think about. No question about it. Why do we build infrastructure if somebody is not thinking about impact and solution? So it's not to diminish the value of thinking, but there are two kinds of people. There are two kinds of funders. There are two kinds of entrepreneurs, social builders called builders. Someone who funds and builds specific solutions that solve something today for a particular well-defined population. Or other people who fund and build infrastructure that allows the rest of the people to solve faster, cheaper. Now we are talking about the latter. We are talking about the idea of DPIs first of all, the idea is DPI is a way of thinking. It is not software. If you think you can outsource it to some IT guys, you totally miss the point. Okay. DPI is not something you can outsource to an IT guy. You have to think about technology as a lever and then you have to say if these are the large kind of problems, kind of problems we are seeing, what is that you, as an infrastructure builder can build, fund and build so that it gets extremely efficient, fast, high, trust, cheaper, faster for the rest of the people to solve.

PV: [00:17:09] Now, it's difficult in the philanthropic space because most funders want to solve it and they want their brand visibility. So my recommendation always is to divide the fund into two infrastructure funds, different mental models, and different brand value, compared to the actual solution funds where you give actual mosquito nets to people who have no problem with malaria. I think you have to do both because if you build the road and nobody builds the car and nobody takes the lady from one place to other place or delivers food across the road, what's the use of building the road? So you need both. But actually, the real question is that there is a significant mental model difference for the people who are builders of the DPI or builders of the infrastructure where the infrastructure game there are a few characteristics different one. You can't do impact analysis or RCT on an infrastructure in a hurry. Maybe you can do, I mean, I don't know. How do you do RCT on the internet or how do you do or something so broad even economists struggle to do is to causation and to find is the economic growth due to Internet actually or Internet plus many other combined causes. What is it? How do you attribute a specific one? We find it hard for infrastructure, it's very, very hard to actually do. There are methods that we can learn from the public physical infrastructure world and we could apply some of that.

PV: [00:18:42] So point number one, if you separate the infrastructure fund and the people who are funding have the DNA of an infrastructure builder and not a solution builder, this is point number one. Point number two. Don't try to do it in a hurry, as ferocity and impact and so on. Rather use for the adoption of the infrastructure for the next layer of innovation. So you ask a different kind of number how many people are innovating on top of this? What kind of innovation are you seeing? So you need to create a new set of metrics. You know that, for example, do you attribute to purely Aadhar for financial inclusion or Aadhaar was just one of the uses. Of course it created the impetus for us to be able to push through, but that plus banking readiness, plus Jan Dhan, plus regulatory readiness, you know, many things, plus geo connectivity and many things would have happened together to say, oh, now suddenly we have 500 million people doing digital payments and, you know, 900 million accounts. We never had that kind of number of bank accounts in ten years. Right? So we did that. But is Aadhar alone responsible, very hard? But you ask the reverse question. So one of the two metrics you can do is that, first of all, when you define infrastructure, create a new

team, new funding and ask a different set of metrics, adoption of the infrastructure metrics, not impact metrics, adoption of infrastructure and usage every day.

PV: [00:20:09] And what and the diversity of that adoption. Two things you can ask. Is it being adopted? Is it diverse? That really tells you that infrastructure is truly becoming a building block that's going to start powering a lot of other things like, you know, is used here or here. It's used here. It's used here. It's used here. Okay. Now I'm starting to see the power of infrastructure. Third, you have to have patience as well. You can't have, you know, go to a village, put in the infrastructure, see that woman's life is changing now. And it's not, it's not going to happen. It typically takes about 4 or 5 years. Now you can have intermediate success. I'm not saying you can't have. It's extremely essential that every country that looks for DPIs have to have an early success story to tell. Now, it might be things like Prime Minister launching a good launch means what kind of launch you know about next year. Okay, there is something happening or the next because neither bureaucrats or politicians have the patience to wait for five years. You know, some visionary may have it. Few visionaries will still see the value. But I think we still need to give them success. So what? Success of infrastructure does not impact success. It's an adoption success and diverse adoption is better. So that's a metric you need to put together. So have separate funding, have separate teams and separate set of metrics for infrastructure funding.

RB: [00:21:42] One of the biggest concerns philanthropy has built into its design in some sense is the risk of non-adoption. Because many times we take solutions to the poor, hoping that that is a solution they want and they often throw it out saying, no, this is not what I want. And then we spend a lot of money trying to convince them that this is what they want and then they still don't take it up. So there is a real risk in philanthropy always that, hey, are we wasting money on something that's not required? And hence when you build a road, the first question that philanthropy is asking is maybe they don't need a road. Maybe we think they need a road. How do we know they need a road? So show me that vehicles are moving. Show me Health outcomes are improving. And hence the second part you mentioned about demonstrating adoption I think is very, very critical because people have to use the road. And just take an example. We built, you know, the Life Skills Collaborative as an initiative where one of the ideas we had was a glossary of life skills terms. It doesn't improve life skills. It doesn't make the state better. It's just a glossary. Today, two years down the line, that's the most downloaded used product we have because people found use cases for it that we didn't even imagine. Right. But it's a leap of faith to say, hey, they will use it, things will come. Et cetera. And exactly what I wanted to come to, which is, how do you know that that is the infrastructure we need? Because that thinking, knowing what part of it to build, I think is really a challenge. We've even tried to work on a couple of our own projects where we struggled with what is the infrastructure element. So what do you think about that?

PV: [00:23:09] So I think a few things. One, unbundling core elements into infrastructure elements is, when you do that, it's not coming from thin air. It's coming from a very, very clear understanding of today's use cases. This is what happens in, let's say in the case of identity. When we did identity, it was very, very clear to us that every scheme in a social benefit scheme or every one of these government funded programs would have to figure

out who the individual is, whether the individual is entitled to do so, and how do you distribute this to the individual, and then how do you measure that distribution and observe to make sure everything is being distributed correctly? And if you start looking at it and you start really looking at even the bottom line, they would say, oh, identifying an individual before that individual has to fill a form and that that form will need to be submitted. A form will ask for some ID card. You know, we were analysing this. This is very, very evident to us, for example, that identity as a natural building block or KYC as a natural building block. Or in the case of when you look at health care, we are looking at health care data, as an underlying infrastructure. Personal data for myself. And today we analyse two things that we analyse. We analyse the use cases. Many use cases, not one. That's a very bad setup to do one. Okay. When you do infrastructure, you have to do 4 or 5 distinct large use cases and say all of them have what is in common.

The second thing you do is the analysis of actual use cases and unbundling to say what is in common in all these things. I saw this building, I saw this house, I saw this. So obvious. What is common when you analyse it systematically? Second, you ask the next set of questions. If you were to reimagine that block differently, then you have a lot of what's called conversations. We have the amount of conversations we have before we decide to go down a route. You know, civil society and individuals and people and thought leaders and politicians and bureaucrats are a number of conversations. And this is one of those things. A lot of us say that we are at that time a shameless student trying to figure out what it really is, our belief that if we do, this will change. Is it true? Are we resonating with this value? So we are trying to figure out the value-unlocking question, Right? We believe it will unlock the value, but we have to stress test that assumption by asking if this is the second phase. Third, we almost always pre-identify who are the potential adopters of these DPIs. We are not saying we will build a DPI and they will come. No, no, no. In 2011 and 2010, when the Aadhar was launched in 2010, by 2011, Nandan was in front of the Reserve Bank of India team and he was in front of every one of them saying will you open an account? They said, No, we won't open the account.

And literally, they said no, why should it be open? We already have KYC. What is Aadhar? Explain to me what Aadhar is, you know, things like that. Then he goes back again, making sure he really goes back and says, what if we do this digitally? And by then this is the fourth point. But these conversations and early adopter selection is very, very key because adoption has to come on the day infrastructure is coming alive, not in future. Adoption must start. Otherwise, you miss the point of analysis of adoption. It may not scale on the same day, but adoption must start. Okay. That is very, very important. For that you have to have both conversations, knowledge-level conversations about asking whether this hypothesis is true or not. And second is the adopter saying that if I give you, will you actually commit to using it as a committed adopter is very, very, very important for the early days. So before you get the road, you have to get, you know, a real understanding of the economic transactions that will happen on top of that. Let's say you are building some digital infrastructure like electricity. You have to really know if the industry is ready with bulbs. So a lot of that conversation happened to say, okay, if you are putting electricity, the first use case is not some mixer or a fridge, maybe just light, you know that is a first use case.

Let's find that killer use case. What's called a killer use case? Get that going. Then the third aspect of it, even all this is done before infrastructure is built. And the third aspect is what we call plus-one thinking. Plus-one thinking is where we talk about the readiness of usage by the people, by the industry that supports the people. For example, if you are doing an electricity grid, everybody, everybody says, Yeah, if only I had light, I would use it. I'm committed to using light and I will invest. If you get me lights, I am a buyer. I'll tell the government or somebody would say in the schools or in these public places, I'll light up. So first use case I'll commit, you know, but. There is no industry to build bulbs. Then what's the use? So that's a plus One thing plus one thing you're also analysing is the bulb industry ready. Are people ready? Is people's understanding of using your electricity ready? Are the wiring cabling, and electric distribution guys ready? So we have to analyse the distribution and support ecosystem readiness. That is what's called plus-one thinking, including people's behaviour. A lot of times we asked, for example, in education parents of small children have an absolute mental model. That smartphone means no education. Smartphones mean games. Smartphones mean stupidity. Nothing to do with learning. Textbooks mean learning. You open a book, they will say, oh my child is sitting in front of a book. Very good.

PV: [00:29:15] Very good. But look at the mental models of parents. So there is a natural resistance that will come when you try to push. So we have to analyse the plus one readiness as well. So we have to do these three things. One unbundling of the problem very, very, very clearly to understand what is common and generalizable. Second, the hypothesis of waiting and early committed customer selection. And the third is a full analysis of all stakeholders. All stakeholders, including stakeholders who are going to oppose you. Very good study. It's absolutely worth saying who is going to unionise against you. We are literally right. I mean, if the horse guys are going to unionise against you, you can't bulldoze your way through. Maybe you have to bring buses first as automobiles because other horse guys will say, yeah, a bus is not competing with me. No, not a problem. The bus will become a van and then become a car and then eventually the car will come, right? But if you take on exactly what horse carriage does, then you are literally asking for an uprising of the current society. Right. But there are alternate automobiles you can bring nothing wrong with, you know, which will eventually lead to a car. Yeah, because you have to study this very carefully, because this is what if you try to do it with farming, you can look at the farm laws and you will see the massive pushback. And then you have to backpedal and, you know, waste your time. You have to understand a lot of that upfront.

RB: [00:30:42] Pramod, this is gold, in my opinion. For me, I'm an engineer, so if you give me a step-by-step approach, I'm like, Yeah, this is exactly what I want to play back to you for one concrete example, how this can be done to make sure that I have understood it right, and also for the listeners to actually see how it gets played out. I'm making this up on the fly, so you have to correct me where I'm going wrong, right? So I'm going to take agriculture as an example. I'm going to say that everyone worries about farmers being economically sustainable because 51% of our population, 15% of GDP and let's say, want to make farmers sustainable. I'll take one use case, which is a credit use case, and say that, hey, what is required in the credit, then take the climate disaster, which actually is impacting farmers.

Well, how do we look at repatriation? Anything that we provide to farmers. Then, I'm looking at use cases of productivity, farm improvement, you know, throughput improvement, etc. And let's say across all of these use cases, what I'm recognising is that if we truly know the quality and the status of the land and the agro-climatic conditions of a farmer, I can give him better credit. I can give him better benefits, I can give him better farm inputs, etcetera. And we say that that is the unit, let's say the land as a unit and the data about the land as a unit and the agro-climatic conditions, which is really the common piece and multiple use cases from climate disasters to this to this. So that's number one. And if I know that and if I can flesh it out by saying, okay, I'm going to create a digital public infrastructure that helps understand for any farmer anywhere, what is the quality of the piece of land, agro-climatic conditions where they're operating.

RB: [00:32:13] Step one. Step two is now going to banks and telling them that. Will you be able to provide loans? If I provide you with this information, let's say the people are trying to build the digital public infrastructure. Let's say there is this consortium of stakeholders, but think about bringing a set of people who deeply care about it and building this infrastructure they go to. So the equivalent of this case, right? And the bank says, yes, if you give me this information and let's say we go to the National Disaster Management Authority, we say, okay, any climate disaster led to a flood repayment, we will do it based on land quality, etcetera. Then have to come back to the third step to say, do we have satellite imagery that can actually tell us some of this information? Do we have apps that can use this information to provide better input data? Do we have credit applications, fintech solutions that can use this data, etc? Do we have the downstream upstream solutions, all of that? If the answer to all of these three things is yes, that if land and land data is actually helpful, be if the primary providers are adopters on day one and see if the fintech providers, satellite imagery providers, all of them are useful, then maybe there is a case, maybe there's a 20% chance of success. Have I got this right or am I thinking some of these wrong?

PV: [00:33:23] You are thinking too complexly. I'll tell you why I can't comprehend. As an architect, I can't comprehend half of this. So the reason why is this? DPI thinking is about a few necessary building blocks. But you already are thinking of sufficiency. It's not so. Problem is a necessary condition and sufficient condition. You are in the solution mindset. You are not in a digital public infrastructure mindset. I said screw satellite data. Screw everything else. Do you know if the farmer is even alive and genuine? Point number one. Okay, now we can say, okay, of course, Aadhaar is there. So in India, it's not so bad. In other countries, we need identity at least. Okay, let's solve that. I'm not at all worried about credit. I'm not worried about satellite data. I'm not worried about anything. You ask a reverse question, I'll take the example of Ford, who said once. Right. Somebody asked him, if you train all your employees so well, you know, are you sure you're going to get better, productive, very, very productive, a good labour force? Wouldn't they quit? He said I would rather have educated employees leaving me than dumb employees staying back. Okay. It's because he was thinking of necessary conditions. Ask the reverse question if I don't educate my employee. You are guaranteed to fail. Okay, let's start from there. Okay. Now, does it mean you are guaranteed to succeed if you educate the employees? That's where a sufficient lot of us get stuck on sufficiency.

PV: [00:35:06] Will it actually solve? But what'll happen? You complicate so much that we don't end up doing anything. You ask for a necessary condition. Can we make sure everybody has an identity? Can we make sure everybody has a bank account? So if you really look at banks, we don't ask these complex questions to banks and all that. Okay. Don't ask anything. This is too complex. We unbundle and look for necessary building blocks, not sufficiency, never sufficiency. If you are in the sufficiency mode, you are in the impact mode. You are in solution-building mode. You have to solve it. If you are in a necessary building block mode, you are in infrastructure mode where you are saying without it you are screwed anyway. So let's start by giving obvious things to people. Not doing it is a guarantee of disaster. Okay, so we have to do what is necessary. It is very, very important for us to be able to think about that. It is important that if you are a builder of infrastructure, you don't ask obvious questions. Obvious question. You will get an obvious answer. You will say, if I give you all the data, will you give me the loan? You say, Of course, I'll give you.

PV: [00:36:15] Then you say, why are you not giving today? You say no, but then you ask the question, what is the process of giving today? Then you say, Yeah, we collect all these papers. Then somebody goes home. Somebody goes and verifies some. We send some surveyors, you know, to the farm because nobody can trust them. The farm is even genuine. So everybody goes and measures. So what is the cost of that? So we collect. This is why we realise the cost of a bank account opening was ₹150-₹200, and the cost of a mutual fund account opening in India was ₹1,500, $20 roughly. Now, you know, five six years later, post Aadhaar, KYC and so on. But before Covid itself, the cost of that had plummeted from ₹1500 to ₹15, and bank account opening had plummeted from ₹150 to ₹1.5. Okay, so literally, it's not an order of one reduction. Now that's what you look for is very key. And this is why we have a very, very simplistic model of thinking. I don't complicate my life at all. Okay? Because it is multidimensionally complex, societal problems are multi-dimensional. We see education in schools, trying to teach some triangle geometry, and basic geometry to a child. She's not even eaten. That girl is not even eaten in the morning. There is no sugar in her body.

PV: [00:37:37] There is nothing. Maybe at night too, she was starving. So is there a health care problem? Nutrition problem or education problem? Right now, these are all multidimensionally complex problems. So if you try to solve it. The infrastructure builders will get absolutely confused about everything. Infrastructure builders should ask very, very basic questions. What are the necessary building blocks we must do without which we will not see economic growth? We will not see progress coming, right? Solve them. And as you solve them, always say that when I solve those, I always have the first adopters of it lined up and starting to use it, then use all the next necessary conditions and the next and next, and eventually the last set of people who are trying to solve the real farmer problem will say, Now, for me to give lending to a farmer, I can do what I used to take 20 days to do manual paper processing and it will cost me, including some surveyors, some ₹5,000 costs or whatever, doing all the background checking of all the data. This farmer is producing before I can offer the lending offer now plummeted to two hours and the cost has plummeted. Instead, ₹5,000 is like ₹50. And suddenly that allows me to be in high-trust, low-cost, high-volume environments. Without that, we are absolutely sure we will get some 100 farmers

eventually, but not everybody can get it. Same thing. The reason for SME lending is not happening in India. It's easier for a large factory company or a, you know, multi-billion 1100 crore, 1000 crore company to get a 15,000-crore loan. It's so much easier than, you know, ten lakh revenue-making SMEs to get a ₹50,000 loan. They can't get it. It's not because banks are not interested in giving. I can't trust anything you are saying. And the cost of trust and cost of verification and cost of paperwork and cost of background check is so high that giving ₹50,000 and charging 12% as interest, my cost is more than the interest I'm going to earn. If the cost is more than the interest I'm going to earn because you're going to, you're not going to take a 15-year loan. SMEs take a two-week loan. Okay. Three-week bridge loan. What is the interest you can get? But the cost of dealing with you, the cost of dealing with you is so high that I would rather say, no, it's not economically viable. So the idea is to dramatically reduce cost, increase trust by building what's called a necessary building block and get early adopters going. So I would not ask any of those questions. I would ask very, very basic questions.

RB: [00:40:35] A colleague of mine recently introduced me to this word called bus list. I don't know if you've heard of the bus list, which is that if this person falls under a bus, then the company fails. Apparently, that's the bus list. So every company has a bus list of people saying, hey, these people fall under a bus, then the company is shut down. So we have to keep the bus list, as, you know, as large as possible so that there are sufficient people. What is the bus list of DPI thinking in India today? And I'm hazarding a guess that it's a very small number, because there are so many people thinking solutions, and very few people thinking of infrastructure. And given where we are today, that is demonstrated value. It clearly solves problems at a scale much faster than anything else. Jio success story, all of that. We need to have a much larger group of people who are thinking about infrastructure, who are funding this thinking, but it is not the case today is a hazard. I guess I'm hazarding. How do we change that, Pramod?

PV: [00:41:26]Just before we go there. There is significant confusion about DPI versus simply digitization. For example, the government would say, oh, we have created a national career portal, you know, or career service portal for the blue-collar job portal. And they would say that this is DPI. And our argument is that DPI has two real two characteristics. One, it is not a solution, it is a building block. Second, it is a building block that gets used by someone else outside. If you're building a whole portal, whole database, whole solution, whole processes, the whole thing, you are digitising, I'm okay with that. Nothing wrong, but you are digitising a solution. Don't call it a DPI because the next person will rebuild all that all over again. You know, the same blue-collar workers in the labour ministry will do the same thing. Some other ministries will do the same thing. The Education and Skill Ministry will do the same thing. Everybody has another career portal or another skill portal going on. So the real question is about whether infrastructure is not trying to solve anything, instead it distributes other people's ability to solve it faster, and cheaper. And then the real measure that way is that is it a building block, one building block that is cross-cutting across use cases? Second is that building block used by others when it gets launched? Are there adopters who are using it in diverse scenarios? Right? If these two are true, you are truly building reusable digital public infrastructure (DPIs) as building blocks. So this point one

second, the bus list. You are right. This is new. I mean, as the way of thinking is new, India has been practising for a while, but even there, I would say only a handful of people, some of us have been there. So, you know, some of us may be part of that bus list. It is important that we spread and improve the understanding of what DPI is and DPI thinking is. DPI thinking is not about building some software. It's a way of unbundling and a way of looking at plus one adoption way of getting market, making way of creating an ecosystem to use it. Aadhar by itself is so simple. It really has four attributes and two APIs. Right? That's all. But what did we do at what scale? And then we got banks open, the mutual funds to use it, SEBI to use it, and benefits transfer to use it. Nothing to do with identity authority, the same as payment. The payment as a rail is used by many, many, whether it's the government is paying, salaries are paid, B2B payments are going on, B2C merchant payments are going on, you know, subscription payments, IPOs subscription, gifting, all kinds of things are happening on bill payments are all happening on top of.

But payment is just a reusable building block that moves money in a guaranteed way and, you know, between two parties, right? So this thinking is not obvious, but it's been done before. So I would think that if we put our mind to it, we can get a few practitioners quite easily. There are already a few practitioners in India. There are few practitioners around the world. It's not an Indian phenomenon alone. There are few definitely on the identity and payments. There are enough examples, you know, whether it's Singapore, Thailand or Estonia's efforts. Smaller, smaller countries. Nevertheless, they all have taken an effort, Pix in Brazil or, you know. Folks in Ethiopia or folks in other African countries are really doing a good job of trying to build some basic infrastructure. But actually, when you look at many of the countries claiming that we have done what they have done if we have digitised, does it mean it's DPI? So you ask the question, how many API calls? It's a very good way to ask how many people are using that specification or API calls, and how many diverse cases If that then you have a DPI going. Otherwise, you have good digitization going. You know that's what will happen. We are part of what we just announced. A centre for DPI in IIIT Bangalore, and I also heard there will be more centres like this will come up and it may not be. We don't want it to be an exclusive centre. Let there be more centres. You know for example, I'm very sure you, in your capacity will talk about DPI to the funders and DPI, how to think about it, how to create separate funding exercises as an infrastructure and how you measure infrastructure slightly different from impact measurement, which are used to how do they carry their brand? Because they feel philanthropy is a brand, they still want to show it up. So how do their cares, such as brand, get solved in the infrastructure funding use case? Some of that you will discuss. So you will discuss funding. Somebody will discuss policies. People like us will discuss design and architecture, and somebody else will look at human use cases, the field studies, to understand early results and what worked and what didn't work and how do you improve the system. More and more, I think everybody has to basically understand this. DPI thinking is not simply going and digitising or throwing tech guys at it. It is a way of leveraging technology and creating reusable building blocks that creates exponential solutioning by someone else. Others can now build faster, cheaper, you know, because you build the, you know, underlying foundations in one sense, you build all the infrastructure in one sense.

PV:[00:46:54] That's why it's called infrastructure correctly. So the second point you have to understand is that it does not cost money and then recently said that very well. DPI thinking DPI commitment does not take deep pockets, it takes deep conviction. That's what he said to all the finance ministers. It was brilliant saying that it is about a way of thinking. It's about wanting to create interoperability, underlying rails and create innovators, excitement and energy to be able to eventually solve because we will create enough problems for humanity that we will not run out of problems. So we'll have enough problems to solve, but an idea to do necessary conditions, some necessary should people own their data? Should people have bank accounts? Should people in the digital world, should they have a digital identity that they can prove, you know, successfully instead of paper? Should some common open data should come out as public goods like health care, open data and, you know, sanitation or, you know, urban open data, instead of getting locked in, should it be a public good? Should we get it out? You know, I think there is some basic stuff we must do and we should just do it and trust the fact that when you create reusable building blocks, innovators will surprise you and find a mechanism. But the good thing with philanthropy, though, is that if they fund both sides infrastructure side and this, then you can even sometimes fast track the infrastructure usage because you can also say with this infrastructure, I'm funding a program to leverage that infrastructure and actually to solve in a different, faster way, but doesn't mean others can't use it.

PV:[00:48:24] Others can also use it similarly. So they can set an example also saying how to build infrastructure and how to leverage infrastructure to solve something faster and at scale. And when you do this, I think it is important that we continue to build local capacity. We are also creating a global DPIs residence program in the IIIT B through people who can immerse themselves in the design every day like an apprenticeship and become a natural practitioner of the idea of DPI. Not everybody has a need. This is not a tech problem. Tech can be, you know somebody will solve the tech. How to implement is easy, what to implement and why to implement is the hard part, you know. So then it always says you can't outsource thinking, so you need people who are in the thick of it truly as a partner to various governments to say how to think about it and how to get this out. And once you can get why and what you can outsource the how, I mean how to build it.

RB:[00:49:23] And in my mind, I'm going to frame this slightly differently Pramod and put a hypothesis. I think four things are necessary for this to become a movement in some sense where a lot of people are doing it right. One is people who can design what needs to be. We need more Pramod Varma in some sense. And there your idea of going to IIIT B is useful because in my mind I'm also thinking it's far more intuitive for the new people who come out of the program to think like this rather than for existing architects to change their minds. It's very hard. That's one of the design experts who are coming in. The second is the funding sources. And there, as you rightly said, organisations like Sattva that understand the funding constraint should combine the funding constraint with the, you know, value that is here, make a package that then is able to sell it, build a community of funders, etcetera. The third is the ecosystem, the policy, etcetera. And honestly, I think what the community around EkStep and others have done is make this politically viable today. And I think there is state-level work that needs to happen now in different states so that this becomes a movement. I

think for me, all these three seem solvable. The fourth point is for me, entrepreneurship. The political entrepreneurship to get the ecosystem coming on top of it, governments to come on top of it, etcetera. I struggle with that. You know, I feel like that's the hardest constraint to solve. And honestly, once you solve for entrepreneurship, it's easier to solve for funding because funders support entrepreneurs and so on. The ecosystem trusts the entrepreneur. Do you see that as a problem as well? Is that a big constraint in your mind?

PV:[00:50:58] Yeah. You know, see, there is always time for everything. India is very lucky to have all four firing. Okay? In one sense. Few countries are also that way. You'll see all four reasonably starting to work well. But in some countries you may not have a mature entrepreneurial ecosystem. In that case, you can't import everything, but it might turn into a struggle. But sometimes I think all three are equally struggling. Some, according to me, all four are equally hard. I think design in one sense is easy. What I do is easy as long as you have political alignment. And if you have, you know, absolute excitement in that country that we must do it. People are inspired to rally behind it, then we can actually come. And I mean, it's not so difficult to unbundle something and figure out what to do so that we can get more practitioners there. It's not a big deal. We actually find both political and bureaucratic alignment because they are naturally short-term oriented. They may not be amenable to understanding what's going on. That is one issue we face. And the bureaucrats, a lot of times departments or ministries don't collaborate naturally with others, other ministries and departments. So you will see a lot of silos in the government because of this. And some of that continues to be a struggle. I agree with you that if there is a missing piece of the puzzle and then you get policy readiness, and infrastructure readiness, but there is no innovator, you know, there is nobody to innovate but I have a way out, though the two things I find this useful is that Aadhar was not, frankly a full entrepreneurial story initially.

PV:[00:52:35] Aadhar's first big adopter was the government. And regulated bodies like the Reserve Bank of India and banks. Right. So you don't need to be entrepreneurial unless you start doing this more and more. My takeaways are, one, every country needs one success story that they can boast about. Success breeds success. Success builds belief. The only reason India is repeating this again and again and again and again, you know, today it seems to be quite a casual way, graduating and everything. They rename it with U in the middle and the U. In the beginning, you know, U started, UPI and then now you see, you know, unified everything you want, unified everything, something to do with you. Right? Because all this comes from the fundamentals that once we believe the belief that sets into the society, *we can,* then like the Obama campaign, *we can...* the belief comes in, we can, we tend to do more and more. So that one success, orchestrating that one success in their context that changes their societal and political belief and bureaucratic belief is very, very key. If you can get one thing going, you will be surprised how much we can breed again. The only reason was that we launched eSign and Digilocker because Ramsevak Sharma went from here to MeITy Secretary in 2014 after his stint in UIDAI, he said, okay, now I believe this something can happen, something big can happen and Pramod, you know, what can we think about? We seem to have an IT Act but nobody uses a digital signature.

PV:[00:54:21] Then I wrote the eSign paper. Then I wrote the Digilocker paper on how to Credentialism and all that because I was thinking about certificates being everywhere.

Certificate. We love certificates, we love photocopies of certificates. You know, we love everything about certificates in this country. So we were thinking that what if we can, you know, make it verifiable, simply remove... That was the beginning of Digilocker, right? So now we are doing credentialing at scale, vaccine credentialing. Everything is verifiable for us now. So I think we have to get that first success. So that is key. The second point I want to say is that don't necessarily wait for entrepreneurs to step in. Look for 1 or 2 killer use cases. The government sometimes can be the biggest innovator. And because the government can also have one of the biggest machinery in one sense, right? They have them although they believe they can't, they can, you know, sometimes they can overdo also, you know, so it's very important that the power they can have is enormous to pull something off. So if they really want bank account variability, they will make it happen.

It will be surprising how much they can do. Or so the question is can we align with the big intent at the political leadership level to align that, to say, let's use this DPI at least for our own sake? For example, you build the road. Private cars are not there. Car companies are missing. Car company importing is too costly. Even if it's imported, people can't afford it. But nothing is stopping you from running public transport. So you can think of how to induce initial usage by the government itself or regulated entities. Not a big deal at all. We can absolutely do. Digilocker, that's why we saw an early user driver's licence department only. Private companies are still not depositing enough in the Digilocker, I still feel we are. They're actually behind in credentialing like your salary certificates. We are not making salary certificates verifiable. We are not making your employee certificates verifiable. There are still paper certificates we give "to whomever it is concerned". Yeah, Rathish works in this company type of situation, right? Today we give it because sometimes you have to show it to the bank or to the rental agreement or whatever. We have to do all that, but they're all paper. Why is it not digital? Because you'll be surprised. Actually. The government uses Digilocker more than the private uses Digilocker so you don't have to wait for the entrepreneurial ecosystem is my second point. So you have, I think you have ways out of this thing.

RB:[00:56:49] I have a couple of observations, and I also have a couple of closing remarks as well. I think two things. One, it's very amusing when you say what you're doing is easy. It fits into my mental model that whenever we do something, we find it is easier to do. I actually think what you do is very difficult and I think now that it comes to you so naturally it sort of seems easy. But creating people who think like this I think has to be an education process. Like we have to, sort of, build for institutions. And second, I think the point of entrepreneurs is fully taken. And even with the government -- PDS becoming millets' first customer, enabled millet adoption -- I do also believe that there needs to be an entrepreneur for the infrastructure. Also, like if Nandan hadn't pushed as an infrastructure entrepreneur, I don't think we would have reached it. So even an infrastructure entrepreneur is important as an innovation entrepreneur.

I have so much more to ask you. You know, I wanted to ask you about industry adoption in general. You know, I was talking to RS Sharma recently. He was talking about how there should be more industry adoption. Wanted to talk to you about sectors, but guess we are…

PV: [00:57:44] There are enough architects and engineers, By the way, even you as an engineer who is not meant to be a practising engineer. If we have a few hours of conversation, you might say, oh, this is what I came up with. But Pramod just shifted my change, meaning after that you can do…you don't need me. It's about just getting this piece and like necessary when told you necessary, I think very differently. Of course you know. Yeah, let's you know we always think it's too complicated, problem solving, not simplified infrastructure solving. Right. So few things are good enough to trigger and that's why we see more and more architects starting to do so. The reason why I said it's easy is because a lot of time, simple mentorship and guidance are good enough to get the people going. Half the time we don't know what to ask and what to do now. *How* is the easy part right? So that conversation is easy. Second, on the private companies, I think it's a journey at the end of the day that is only ten years, you know, into our 10-12 years into, you know, really until 2012 when Aadhar was barely known. Right. Other than some early news about Nandan coming there or whatever, nobody really understood the full impact of it. So we really are just a decade. We did so much in a decade. We are impatient. Okay. And we see this saying, you know when I say this happens in DigiYatra or some conversation on Twitter, they would say, Oh, but this is not there. And I always tell them, you know, patience is a virtue. It takes time. Infrastructure, adoption, behavioural change, a societal level at large scale change, it takes time. Even private companies will be surprised. Although we always feel private companies are faster innovators, not necessarily so. Sometimes the government is equally fast to innovate, which is why we should not shy away from saying if there is no privacy, we will also start innovating. The government can also innovate, and regulated entities can innovate, although they might come across slow to you, and startups might naturally sound like faster people. But actually, when startups are slow, you know UPI when we saw how many startups we had to struggle to convince them why. In Koramangala we couldn't convince the five startups to join UPI, and the two years later said, okay, you didn't tell me! Like from day one I was writing. We were writing a spec, right? We were telling you a few companies like PhonePe jumped in the wagon, but others didn't. So you will see the standard curve of people, early adopters, and then of course, the late majority all the way going. And I would think every such cycle has its same adoption curve you will start seeing. And industry today if you go back. I did a NASSCOM session and all that with private industry. They seem to be very, very much ready to start to leverage it, start to build, and start to talk about it to their customers. In other countries. They are starting to do all that. Until then they thought, oh, something, you know, Digital India thing going on here, right? They can see the value, but they don't know what to do. They don't know what it means to them. Now we are saying, no, everything you know, there's a significant thing you can do even in your own everyday life to be able to push the idea of digital as a lever, to be able to actually dramatically reduce the cost of access, cost of trust and cost of engagement at large so that, you know, just reduce it so that we meet the necessary conditions. After that, if you give all the… today we have rich people. Money is not a problem. Educated people. So rich, educated people being unhealthy, very, very bad habits of eating chips in front of the sofa type of situation. Right. Who is saying you are more educated guys, money is not an issue. Why are you unhealthy? So sometimes, you know, just by giving education, giving access doesn't mean it will actually solve the problem. Just to close it out a few days back,

some journalists asked me, did Digital India actually solve poor people's problems? I said, oh my God, no, I think we will create enough problems for ourselves forever. But not doing it would have been a disaster for us. We would have never moved on to equitable economic growth without people having an identity, bank account. Access to education doesn't mean they will learn. Access to business opportunities doesn't mean they will do good business. You know, access to lending, access to capital, you know, doesn't mean everybody will do it, use it, use it well. But your necessary condition has to be met. You know, you know, sufficiency. God knows, you know, hopefully, we'll collectively do a good job. Who knows?

RB:[01:02:22] Pramod, it's such a joy to talk to someone who deeply understands the topic. Right? Like and I've loved engaging. I can speak for another hour like I said, but thank you so much for your time. I hope everyone enjoys the conversation as much as I did.For me truly, two things happened today. One is, as you said, there's a science behind designing infrastructure. It seems abstruse from the outside, but when you step in and are able to do it as an iterative process, it makes sense. And two I'm actually more excited about what is ahead of us and what we have done. You know, I think as you said, *picture abhi baaki hai* and this has only been ten years since we have a long way to go and that sense of optimism is a fantastic note to close on. Thank you so much for your time and I look forward to meeting you again soon.

PV:[01:03:02] Thank you, Rathish. It's been a wonderful conversation. As you said, we could have talked forever, but don't think anybody wants to listen that long, so we better wind up. Take care, everyone. Thank you.

Outro: *Thank you for joining us here on Decoding Impact. We hope you enjoyed this episode and the conversation with our expert. To learn more about Sattva Knowledge Institute and our evidence-based insights, follow us on LinkedIn, Twitter and Instagram and explore our content on our website, all linked in the description.*