

Car makers need to focus on computers on wheels: Seba

BY INDRAJIT GUPTA &
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Part 2 of an exclusive interview with clean energy and transportation expert Tony Seba focuses on how electric vehicles (EVs), self-driving cars and car sharing will change the face of transportation in as little as two years. The foundation of these new technologies is software. Can India take a leadership position given its strengths in software as these technologies converge?

This interview was done in Mumbai earlier this month on the sidelines of an annual lecture in memory of former President A.P.J. Abdul Kalam, organized by the Unifi Foundation. In Part 1 of the interview published on 15 November, Seba spoke about the way solar energy is disrupting the energy sector. Edited excerpts:

What's your sense of the incumbents in the transportation space? Renault—and Carlos Ghosn (the chairman and CEO of Renault, Nissan and the Renault-Nissan Alliance)—did see the writing on the wall, but given the legacy, are they better placed now to make something out of the EV and self-driving car opportunity? Or has Tesla grabbed it?

Tesla has shown that it is a disruptive thing, that it is happening. Tesla itself doesn't have strength in manufacturing and so it has allowed time for the industry to catch up.

The only question is, will they disrupt their own business model? A lot of OEMs (original equipment manufacturers), even though they are talking big about EVs, are still living in an ICE (internal combustion engine) kind of world. You still hear Daimler talking about making 10 EV brands by 2025. Hello! By 2025 every car will be electric. If you make 10, then that's all you are going to sell. So a lot of it's bubbling up to the top that this is a disruption and this is going to happen really, really quickly.

Some companies get it. Nissan does and Carlos Ghosn got it a long time ago. But what Nissan did not do was build a 200-mile, a 320-kilometre EV (one that can drive that distance on a single charge), and that's what you need to go mainstream. Nissan saw the market as an eco kind of market (the eco mode in Nissan cars puts it into a more fuel efficient mode) and they built manufacturing capability, but they did not build a 200-mile EV. Tesla understood that that's the minimum that you need. Nissan now gets it and if you look at its Renault Zoe that was announced at the Paris auto show, I think it's a 186-mile, 300-kilometres—so it's getting there. Nissan has the manufacturing capability. I went to Nissan's manufacturing



The whole world is going electric, self-driving and sharing, says clean energy and transportation expert Tony Seba. **ADHIJIT BHATLEKAR/MINT**

plant south of Tokyo in Oppama. I saw where they make the Nissan Leaf and they are ready. They can scale like this (snaps his fingers). It has three plants like that one around the world: North Carolina, one in the UK and one in Tokyo. The interesting thing about that plant is that they make ICE cars and EVs not just in the same plant but in the same line. So you see the Leaf—EV—and then the ICE car, ICE car, ICE car in same line. So when the EV market takes off, it is ready to scale. It can take the ICEs out and triple the manufacturing, probably quadruple it. But Tesla has to build all of this manufacturing from scratch.

the wall much sooner. Do you see that?

Yes. There are companies that once they got it, like Ford. They got it. They understand that this is going electric, self-driving and shared. They are investing billions of dollars in new capabilities. They are hiring software engineers by the hundreds. They are dramatically shifting gear to service orientation.

So it's not just that the world is going to EV, but also what's going to happen is that because everything will be shared and utilization of cars goes from 4% to 60% or 80%, essentially it's the sharing companies that will have the relationship with the consumer. So my relationship—I've not owned a car in 10 years, so I talk from experience—is with Lyft and Uber and Zipcar, more than it is with a car manufacturer. A lot of companies don't realize that it's not just about the EV thing but it's also about the sharing thing. You are going to lose the relationship with the customer.

Ford understands that and they are getting into that business also. They are investing heavily. GM invested \$500 million in Lyft so they are not creating their own. BMW is also investing heavily in the sharing portion. So some companies get it that that's where the world is going.

I forget who said it, but there is the fear in the car industry now that they are going to be the "Foxconn" of the auto industry. Meaning that Foxconn makes iPhones and iPads but they don't

have a brand. If you look at the cost of goods sold for an iPhone, Apple is making a huge margin and Foxconn is not. It works for Foxconn but it's not a great business. So there is a fear in the OEM industry to be a Foxconn and it's starting to sink in, but I don't think it's sinking in fast enough.

The whole world is going electric, self-driving and sharing.

What needs to change in the way incumbent car companies have been working?

They need to think of themselves as a high-tech company. This has been a hundred-year-old industry. Cars are not that different really from the way they used to be 60 years ago. OEMs say that, "Oh yeah, we have a lot of high-tech in cars." But that's not really true. Yes, there is a lot of semiconductors, sensors and whatever, but essentially the way they think of cars is still the same. You don't think of cars as a living, breathing product. You have to do that just like Apple thinks of iPads and iPhones. You give out the software and you download and you keep it happening on an everyday basis.

They should think of vehicles from now on as computers on wheels. If they still think of EVs as a substitute, they are still going to lose. EVs are computers on wheels and they are going to be living, breathing products, and if they don't think that way then they are going to be disrupted. And they may well be the Foxconn.

You talked about the convergence of all of this. For a country like India, we are not even in the realm of having reached maturity in any of these—how do you think this will play out?

I really see that car sharing is big, with Ola and Uber and so on. So three dimensions—one is sharing, one is EVs and the other one is self-driving. Two of them are software and one is hardware. If you think about that, then it would make sense for India to play in the sharing (space), which is already growing, and also in self-driving. And then the rest will follow because the market will take. Because EVs already are 10 times cheaper than fuel—to charge, to maintain. Then when you go all car sharing and self-driving; by extension these companies are going to demand EVs because their cost are going to be far lower with electric than with ICE.

So, if all India does is the car sharing plus self-driving thing for now, then EVs will follow very quickly because the market will demand it. Because Ola and Uber are going to say "I want EVs." The CEO of Uber for instance in the US, publicly said if Tesla would make 500,000 self-driving cars, they would buy them all.

Even if you compare self-driving together with sharing and ICE versus EV, it will make a big difference in the cost of ownership per kilometre. But again, self-driving and sharing both depend on government regulation.

So, the government needs to get that this is going to happen and if regulation prevents competition and prevents sharing and so on, then all it is going to do is stunt the market and prevent Indian companies like Ola from making this happen. If the government regulates in such a way that it prevents self-driving for instance, then it's going to prevent the Ols, the Indian Ols in self-driving, from both developing the software and getting into this market.

Again because of India's strength in software, this is a natural way to go and EVs will follow.

I'm speaking with a few entrepreneurs who are attempting to be an EV player at some point in time. Their reading is that given the regulation and user behaviour, it will be a gradual transition with a path to hybridization and then to full EVs. Do you see it panning out that way?

No, hybrids are not disruptive. Hybrids are a product line extension of the internal combustion engine. We've had hybrids for 20 years or so and they have not—with few exceptions—sold that well. Which leads people to believe, "Oh, hybrids have not been successful, so why would EVs be successful?" They are two different things. The pure EV drivetrain is disruptive. The fact that you can charge at home—or anywhere—that's disruptive. The fact that you can charge your car with your house and you can charge your house with your car. So basically you don't need to go through the hybrid path, you go straight to EVs.

How do you see the public infrastructure for public transportation? Your presentation talked about a self-driving truck on the road—that one is not EV. But Nikola Motor is building an electric truck...

Yes. I know other companies that are also (doing so).

Do you see trucks and public transportation leaping forward

automotive cars?

It depends on the market. In trucks, I think self-driving will be, plus EVs. If you look at the trucking business, energy is a huge component of that. And people (cost). So going electric and self-driving would be a cost-cutting measure. It would be a natural thing to do for the logistics companies. So, the market would make it happen when regulation allows it and it would be a regulatory thing. When those products exist, the market will demand it—the logistics companies, the UPSes, the FedExes of the world are going to demand those kind of trucks and vans. And if the regulation does not allow it, they are going to push for that to happen.

Self-driving in some ways is an experienced good. You have to see it, and feel it, and experience it. And then, your fear of this thing driving itself is gone.

Realistically, when do you think it will hit the roads in the US?

2018. In 2018, you are going to see level 1 self-driving in the tens of thousands, maybe hundreds of thousands of cars. And certainly by 2020, you are going to see them in the millions.

The disruption is going to happen soon after that.

In many ways the technology, it's not a 100%, but it's improving dramatically. And that's because deep learning technology, Artificial Intelligence, learns from data.

In all, Uber and Tesla are gathering a lot of data. They are learning very quickly, and so their systems are improving dramatically and very fast.

Do you see the US leading the adoption?

I see the regulation changing in many countries already. The Netherlands changed regulations. New Zealand, Australia and Canada too. China is going that way too. Baidu is investing heavily in self-driving software and it together with Nvidia, their GPU (the graphic processing unit), they are developing end to end. So, the car part like Google, and the cloud portion for the mapping, and so on.

So, I see a lot of countries going that way from a regulatory perspective—opening up and so on. This is not going to be about technology, it's going to be about regulation. Technology will get there very soon and adoption will follow because it makes economic sense, if regulation allows it.

So, the biggest thing that can stop this revolution is regulation.

It is only regulation, and that's what I say to policymakers when I talk to them—in solar, in batteries, in electric vehicles, self-driving and sharing—in all of these disruptions, governments are in the way. So, depending on what governments want, essentially their role at this point is to help enable this disruption by helping the market make it happen.

And they can best do that by getting out of the way.

The role of the government that wants to see this happen, is to regulate the way that the telecom industry is regulated.

So, if you look at India, in 1991, it had five million telephones; now it has a billion and the only way that could happen is, for the government to stand back.

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But didn't you also say that they made it a little simpler for themselves given the fact that the sheer number of moving parts is just about 18? And the others figured that out in terms of simplicity of design?

Yes, of course. But they know that. Making EVs is not difficult, it's the business model. It's like making digital cameras with Kodak. Making a digital camera was not difficult; they made so much cash from film that it was hard to let go of that cash cow. That is the crux.

One would have imagined in the past 10 years given our deeper understanding of how disruptive innovation plays out, that incumbents would see that writing on



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