SEGMENT 1: Future Thinking and Autonomous Vehicles

Frank Diana: Hello and welcome. My name is Frank Diana with Tata Consultancy Services, where I focus on the intersection of an emerging future and the actionable steps we can take to survive in that future.

Today, I’d like to welcome Chunka Mui.

Chunka is managing director of the Devil’s Advocate Group, a consulting group that helps management, boards of directors and investors stress test their innovation strategies. He lectures widely, and has spent more than two decades as a consultant on strategy and innovation.

Chunka is the co-author of three books on business and technology strategy. His latest book is *The New Killer Apps: How Large Companies Can Out-Innovate Start-Ups*. He has also written an extended eBook, "Driverless Cars: Trillions Are Up For Grabs.” Chunka has published articles in numerous magazines and journals, including Harvard Business Review, Chief Executive, as well as Directors and Boards. He is a regular contributor at Forbes.

And has held senior executive roles with a focus on Innovation and emerging technologies at several leading organizations, including Diamond Management & Technology Consultants, TTI Vanguard, CSC Index and Accenture.

Today, our discussion will focus on reimagining the future, including future thinking, autonomous vehicles and the emerging mobility ecosystem. Chunka, welcome and thanks for joining me.

Chunka Mui: Hi Frank. Thank you for having me.

Frank Diana: Really looking forward to this discussion. I view you as one of the prominent thought leaders in this space and so, I look forward to this dialogue.

Chunka Mui: Thank you.

Frank Diana: So, I’m going to start real quick with a little context setting and then we’ll get into it. I wanted to talk for this next 20 minutes on the concept of these emerging future scenarios and future thinking.

We’ve been talking a lot about these scenarios and how they are driving numerous paradigm shifts; and one of the most impactful things that I see coming in the next 20 years is a convergence of these many paradigm shifts - something that I know you’ve talked about quite extensively and how all of that will
drive a critical need for leaders everywhere to think about the future and think about it in a way that is different than our traditional past.

So, a different lens, if you will, to view the future, realizing that it’s coming much more rapidly than people realize. So, the speed of the future, if you will, is something that I don’t think traditional leaders are ready for; and one of most impactful examples that I use, and I know you use as well, is the autonomous vehicle or the driverless car. You used a question, I think, in your book actually, about the autonomous vehicle and what happens if traffic accidents are reduced by 90%, as Google predicts; and a simple question like that, trying to think about that question leads you down the path of broad and deep implications and I think you’ve really laid that out are quite well. Not only are there implications, but then there are related responses. Those responses will drive what I believe are the emergence of ecosystems; and so in this case, the driverless car, it’s a mobility ecosystem that emerges and how these responses play out, I think define these ecosystems going forward.

So that’s the context in a backdrop.

**Frank Diana:** What I wanted to do is start with a question around future thinking. As I mentioned, the future is coming rapidly and the lens we view the future through has to change. I know you talk a lot about this kind of thing when you help leaders through their innovation strategies. So first and foremost, if you could help me think through your perspective on future thinking and the ways that you coach leaders about thinking about that future.

**Chunka Mui:** Yes, yes definitely. Well, one of the things I often tell my clients is that Dwight Eisenhower was right when he said “plans are nothing, but planning is everything;” because when you’re talking about successful innovation it really boils down to, well it boils down to six words successful innovators think big, then they start small, and then they learn fast and fail once don’t.

And scenario planning is a core part of thinking big in the right way; and by thinking big, I mean that successful innovators are the ones who look to the future and consider a whole range of possible scenarios. Because the future you just, I mean there is so many things happening as you alluded to earlier. You just can’t predict exactly what’s going to happen, so you have to be very expansive in your thinking; you have to be not so proud that you don’t explore the downside scenarios; you have to understand how new developments might actually go against you and help you drive and help drive you out of business.

And at the other extreme you have to have the audacity to say what if I could start with a clean sheet of paper, what if I could build and pursue killer apps and a whole new generation of goods and services that might create whole new markets or disrupt preexisting ones, such as your own.

So, being able to stretch the range of possibilities and understand the whole range of scenarios is the most important thing to do, because that is how you start. That’s how you understand what might happen and what you might have to prepare for.
Frank Diana: I really love something you said in your latest post around “patient urgency.” I mean, I think that captures it well, in terms of the need for urgency; but yet again moving too fast could also be a challenge. How do you talk to leaders about that?

Chunka Mui: Well, I think they all realize that the best thing in life is to know exactly when a technology is ready and when the market is ready for it. But there are too many variables involved. There’s really no empirical way of predicting the future. So the question is how do you get ahead of the game, get ready and be there when the market is ripe?

SEGMENT 2: Reimagining Our Driverless Future

Frank Diana: So, sticking with the theme of timeliness and when to act, let’s pursue the driverless car scenario a little deeper. We’ll start with the timing of when it becomes a mainstream thing for leaders to worry about. Insurance is a great example. I know you’ve pointed to this as well. If we do eliminate all those fatalities, what happens to the need for car insurance? And so, insurance executives are struggling with “when is the driverless car something that I need to worry about?” there’s been a number of folks talking about a mainstream 2025 adoption of driverless car; yet there’s others that talk about when that car is ready for mainstream adoption you need 10 years to replace the fleet, the global fleet. So, what’s your thought on when insurance executives and others need to worry about the driverless car?

Chunka Mui: Well, I think that those kinds of predictions that try to pinpoint a date are exactly what companies can’t do. They can’t try to say, “When will this hit some kind of maturity point and therefore when do I have to start worrying about it.” I think what they have to understand is what are the milestones between here and there; because the winners in the end are the ones who are ready as opposed to the ones who are waiting to start.

So, when I talk to insurance companies in particular, I ask them questions like:

- Well, what happens if we have this “arms race” in terms of the automotive ecosystem working on autonomous technology?
- And what happens if as that gets peeled off into incremental products, that perhaps don’t get us to autonomous driving, but dramatically reduce the accidents that occur?

You know, as you said, Google has talked about eliminating 90% of accidents. And that’s actually a fairly plausible number because 94% of accidents are due to human error; so, if you can automate the technology such that users of the technology aren’t making mistakes in the use of those products, then you might have a dramatic effect.

But what happens if we can eliminate 30% of accidents; what happens if we can eliminate 15% of accidents. Those, that starts having pretty dramatic impact on industry as well because just in the US we spend $ 200B a year on auto insurance premiums and if the accidents went down by 50%, that number would drop down dramatically because it’s directly correlated to the number of accidents and the cost.
of accidents that we have. So, the industry might be looking at a premium base that’s half as large if we reduce half the accidents or a quarter as large if we reduce a quarter of the accidents. And that has tremendous economic impact.

Frank Diana: So, you don’t have to have critical mass for industry to be impacted, I think is the take-away there.

Chunka Mui: Yes absolutely.

Frank Diana: Okay, you’ve talked about not being able to predict and I completely agree with that and I like to think about this in terms of rehearsing the future, as opposed to predicting the future. And I know you talk a lot about a portfolio of options, etc. Which I think is along the same lines as rehearsing the future. In rehearsing this future around the driverless car, you mention milestones, markers, things to look for, obstacles, accelerators. I imagine those are all things that leaders need to start to consider to at least have a number of scenarios in front of them that could talk to potential paths. Would you agree?

Chunka Mui: Absolutely.

Frank Diana: So, in working with your customers [you use] exercises like that to help them create kind of those potential paths?

Chunka Mui: Well, going back to what I said earlier about thinking big, I mean the first thing to do is understand the extreme scenarios. So, what does your company look like, if this technology was sitting in front of you?

- How might it drive you to, how might it destroy your products if there are no accidents, then there’s no liability insurance
- But how might it also enable you to reimagine the products that you sell or the customer experiences you provide

So, understand that wide range of scenarios and then you break it down to smaller pieces for testing

- So, how do you understand, for example in the insurance world, the evolution of that technology and at what critical points might it affect you
- How fast might crash avoidance technology find a way into new product
- How might Government mandates for automatic breaking find their way into products?

So, understanding the technology, where it sits and the potential, as you said potential accelerators, for the adoption of that technology is critical.

You know, I talk to a lot of insurance executives and many of them haven’t been out to Mountain View to ride in Google’s autonomous cars. They don’t have no visceral feeling for the state of that technology, nor have they visited one of the half dozen other Research Centers in the world that’s working on
building that technology as possible. So, getting a firm grasp of that technology is critical and then understanding the possible evolutionary paths for that technology.

SEGMENT 3: The Ripple Effect

Frank Diana: So, I want to shift gears. I want to focus on the ripple effects of these future scenarios. Specifically, but maybe more importantly, how the ripple effect starts to more intensely blur the boundaries across these various industries and I find that this autonomous vehicle scenario works extremely well to get leaders to see just how broad and deep the impact clearly is; and so, one of the things that you have done extremely well in your writing is to kind of make that real for leaders. Talk about the various things that the autonomous vehicle will impact and how it does cross industry boundaries, so walk us through some of the industries impacted, examples would be things like municipal revenue streams drying up because traffic accidents or traffic violations don’t occur or parking revenues drying up. Those kinds of things that people don’t normally think about. So, give us an example of some of the breadth and depth of this scenario.

Chunka Mui: Sure. If we think about autonomous technology, I think there is a breakpoint if we think about extreme scenarios. There is a breakpoint at whether or not the car is autonomous – whether or not it requires a driver. That’s the extreme case, so if we have totally driverless cars, consider this possibility - business models today, automotive business models today are built on individual car ownership. If you did not require a driver in autonomous cars, you could:

- imagine a driverless taxi service that instead of requiring you to buy a car that came to you and in a few minutes time took you point to point;
- Then you start imagining that people might take uber-like services, instead of owning a car
- And there has been financial modeling that says that those services could actually operate for about 20% the cost of owning a car
- So dramatically less costly because you’ve taken the most expensive element of a car service, the driver, out of the equation

Okay, so let’s imagine that scenario:

- You start having uber-like car services, instead of car ownership
- Each year about 500B flow through US car dealers
- So, if you started having a shift away from individual car ownership to mobility services
- That money, that channel gets dramatically impacted
- Now, people will still buy cars, because services like uber will still be buying cars, but they’ll be buying them as whole fleets, as opposed to individually
▪ And they’ll be buying them from manufacturers
▪ So here’s one technical capability that translates to enormous business model disruption
▪ ½ trillion dollars a year...

Frank Diana: Yep. Great example and what about things like less cars on the road, impact to the environment, fuel efficiencies that come from the ability for driverless cars to drag behind one and other. The need for infrastructure diminishes, because you again have less cars on the road. What about those kinds of things. You get a lot of that happening as well as this scenario plays out. Correct?

Chunka Mui: Well, here’s another interesting statistic, in downtown city centers some studies find that as much as 30% of traffic is people driving around looking for parking spots. So, if you have a driverless car that drops you off and then drives away by itself, either to park itself far away in a cheap lot or just go to next passenger, you can dramatically reduce the traffic that’s going around looking for parking spots. And here’s another interesting ripple effect from that. Once you have that, then you start asking yourself – do I need parking garages? More specifically, do I need expensive parking garages downtown or even if I need parking garages at all, can I move them further away?

▪ And suddenly you start thinking well what do you do with all that real estate that’s now devoted to cars? In some ways that’s good because you can repurpose that real estate for other uses. You might turn them in to parks; you might turn them in to commercial areas. But then suddenly, you also have this massive amount of real estate that’s flooding the market which may have dramatic negative effects

So, as you start thinking about these simple, relatively simple technical capabilities you can imagine the ripple effects on industry is dramatic.

Now, one of the things we have to realize is we don’t always understand exactly what’s going to happen.

▪ In the sense that, if we make transportation cheaper by 80%, does that mean we have less cars on the road or do we have more cars on the road?
▪ We certainly have more efficient use of infrastructure, if we have don’t have any more cars on the road, but we actually may actually have miles traveled go up.
▪ Those are the kinds of question you have to think deeply through, if you’re in one of those industries where that’s a critical issue for you.

Frank Diana: Yep and to your point there’s no way of knowing exactly how those scenarios play out. To your point on more cars on the road, the fact that young children that can be driven by driverless car and the parents not required or the elderly or disabled start driving again. All those things could actually lead to more cars in the road. Correct?

Chunka Mui: Absolutely, absolutely. So that’s, I mean those are both challenges and opportunities. They’re challenges if you sit in an existing industry that’s built upon current assumption. So, for example, $80B a year is spent in the US on collision and auto repair – well when you start having fewer accidents
Beyond the Driverless Car

An Interview with Chunka Mui

that’s a bad thing, but if you’re in the business where you might profit from more people moving from the driver’s seat to the passenger’s seat, for example if you sell content or if you’re in commerce that may be a good thing. So, you have to take these developments and follow the trail of effects.

Frank Diana: Well, I think in terms of the objective of that question, objective met because clearly we can see how many different industries, and we just touched the tip of the iceberg here, are impacted and how broadly and deeply you need to think about these scenarios if you’re going to be successful navigating them.

SEGMENT 4: The Emerging Mobility Ecosystem

Frank Diana: So I want to shift gears because we talked about ecosystems and I’m a big believer that our current industry construct will eventually over time, and who knows how much time but over time, really disappear and be overtaken by more of an ecosystem construct that is really driven by life experiences and the number of industries and companies that have to come together or governments that have to come together to enable those kinds of experiences will be broad. And so, for example this is a mobility ecosystem that we are talking about, but there’s also a smart home ecosystems, or a smart city ecosystem which could be adjacent ecosystems to this mobility ecosystem. So, a couple of questions for you:

One, how do you view the industry structure and its potential path and ecosystem specifically? And then talk to me a little about the adjacencies of the mobility ecosystem with something like a smart home and a smart city ecosystem.

Chunka Mui: Sure, well I agree with you completely that it’s long past the time where we can think about industries in isolation. I mean, we’re already at the point where if you think about the economy as is today, our analysis shows that something in the order of $2.5 Trillion flow through “car related” industries, but that’s just not automotive. That’s not only tier 1 suppliers and manufacturers and dealers, but that hundreds of billions of dollars through financial services, in the form of financing and insurance, and then you have as you mentioned earlier, you have municipalities that are dependent upon fees and licenses, hospital systems that are dependent up injuries, energy all that so we already have

- If you follow the money, as opposed to thinking about just the products that always flows through many, many different industries
- What we have in front of us is I think a reconfiguration of that money flow and therefore a collision of industries we hadn’t thought about before
- So, one example of that is that:
Historically we’ve thought about Information Technology as being car components, you know, so GM licenses components from Ford and Intel and things of that sort into the car, but they’ve been suppliers.

When you think about autonomous technology what you really have is a collision between technology and automotive ecosystems so,

- Cars of today are really cars with computers inside on them
- Cars of tomorrow may be more like computers with wheels on them

So, we have this strange occurrence now where you essentially have technology companies, like Google, competing with automotive companies, like General Motors and Diamler, about who defines the next generation product;

So, you now have suddenly have this massive collision between those ecosystems and the question is, who’s going to be dominant, who’s gonna’ call the shots, as opposed to being a supplier?

And that ripple effect is going to fallout into all those other industries that touch automotive.

That’s just one example, I think.

Frank Diana: That’s a great example, great example.

SEGMENT 5: Virtuous Cycles

Frank Diana: If I can stick with the thread real quick, you talk about the automotive and technology ecosystems and you’ve recently talked about a virtuous cycle involving electric vehicles, driverless cars and car sharing services and how that virtuous cycle could impact adoption rates of the driverless car or any of these for that matter. Can you talk a little about that virtuous cycle?

Chunka Mui: Sure absolutely. If you start with autonomous vehicles, one of the things that the pessimists say is that with all the advanced technology that’s required to go into an autonomous car, it will be too expensive for consumers to buy or at least consumers won’t want to pay all this money for this expensive gadgetry that is required. But if you look at it from the standpoint that I talked about earlier not individual sales, but about a service where the car is used in a taxi like arrangement.

- Analysis has shown that at the profit margins enabled by these mobility services, a fleet manager could pay up to $250K or $300K for the car and still make a good margin because rather than an individual who buys the car and leaves it parked 95% of the time, a mobility service can buy the car and utilize it 80 to 90% of the time. So therefore, they can afford to pay a lot more for the car.

- So, we can think about positive effects. When the technology is ready, you could have the buyers being able to afford 5, 6 times or more what individuals would be willing to pay. o you could have a massive fleet–oriented adoption of this technology, as a real accelerator to it.
Now, extend that out one step further and think about electric vehicles. The knock against electric vehicles is things like driving range.

- But a mobility service could adopt electric vehicles very readily, because they know for each particular call which cars are within the range of requirements for that call. So they can optimize electric vehicles; and electric vehicles are cheaper to buy and easier to maintain so they would have an incentive to do so.

- So suddenly you have this Virtuous Cycle between:
  - **Driverless cars**, which would otherwise be too expensive to buy; but are affordable and enable high profits by car sharing services, so they accelerate that
  - **Car sharing services**, would buy electric vehicles that otherwise people would be hesitant to buy and to close the loop,
  - **Electric vehicles** are a much easier prototype and development platform for driverless cars, so the driverless car builders naturally want to build on them.
  - So, they feed each other and any one component in that cycle might be disadvantaged in the world today, but actually are advantaged in this model that we’re talking about.

**Frank Diana:** Well fascinating stuff Chunka and unfortunately, we’re out of time. So, I want to thank you for joining us today with those great insights and look forward to working with you in the future. If you’d like to learn more about Chunka and his perspectives on the future, please visit Chunka Mui dot com. You can learn more about our work at TCS by visiting TCS dot com or additional perspectives from my blog at Frank Diana @ wordpress dot com.

Thanks all for joining.

**For Additional Information**

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