DRIVING DIGITAL IN BIOPHARMA: TECH TRENDS SERIES

AUDIO TRANSCRIPT

EPISODE ONE: SHALU CHADA

Tom Lehmann: Welcome to Driving Digital in Biopharma and this bite sized episode in a series of short episodes focused on Accenture's 2022 Technology Vision. For more than 20 years, Accenture has developed the Technology Vision report as a systematic review across the enterprise landscape to identify emerging technology trends that will have the greatest impact on companies in the coming years.

This year the trends look further out into the future than ever before, while still remaining relevant across industries and actionable for businesses today. Each of the four trends—WebMe, Programmable World, The Unreal and Computing the Impossible—are ingrained in the Metaverse and explore how today's technology innovations are the building blocks of our future.

The trends investigate the entire Metaverse Continuum, from the virtual to the physical, across patients and machines alike. They identify where ambitious companies can find rich opportunities by uprooting themselves from today and planting themselves firmly in the future.

In this series, I'll talk with Accenture Life Sciences leaders who helped shape our industry perspective of the Tech Vision to inspire life sciences leaders to pause and reimagine how they will approach their business for the next

decade.

For this episode, I am joined today by Shalu Chadha, who is the Global Technology Lead for Life Sciences at Accenture. Welcome, Shalu, to Driving Digital in Biopharma.

Shalu Chadha: It's awesome to be here, Tom, thank you. It is becoming this annual tradition. So I'm very happy to be here and looking forward.

Tom Lehmann: Likewise. And similar to last year, we're going to spend some time exploring Accenture's annual Tech Vision and I look forward to not only hearing a little bit more about that, but also its application to the Biopharma industry. So why don't we get started with a big picture view of this year's Tech Vision?

So why does the Metaverse feature so prominently in our Tech Vision? And just a follow up question to that is really how does it relate to the Biopharma industry? Hearing some questions around does this really pertain to our industry.

Shalu Chadha: I think the nice way to start this is let's talk about the definition because I think we all come at this slightly differently.

So Accenture's definition of Metaverse—really the way we're looking at it is the evolution of the internet, yes. But it's enabling the user to go more beyond just that, browsing and participating. But this is the key word and I'm going to keep coming back to it, the 'persistent

shared experience'.

And of course we're going to go into the real world fully virtual and anything in between. And I think it's dawns on all of us that none of that is NEW—we've lived through it over the two years. The continuum is another part that I think is key in the term. It is going to be really touching all parts of our business. The way we interact with our patients, our customers, run and operate and make our medicines.

And then the second part of your question, I love to…with the study and the survey that we put together and the inspiration for a lot of us in the Accenture Life Sciences practice, we looked at this many different ways and one of them I loved is how will that manifest for us in Biopharma.

So come along with me on this journey: Alyssa is in her physical lab in New Jersey and she steps into the Meta lab with Kim in Hong Kong to conduct that lab experiment. And they're working on trial testing for the rare Duchenne DMD disease for children. And Kim shares the ideas and insights together with the lab equipment and they conduct those impact analysis.

Now, instead of screening compounds for activity in the lab, Alyssa and Kim are actually using virtual reality to view drug interactions, synthetically test and develop those molecules to progress the testing. 18 weeks later, Alyssa walks out of the Meta lab into the research office to meet the company board and parents of three of the kids that were in the trials with Kim in his avatar to share their results and their success. That to me is the Metaverse continuum for us in Biopharma.

Tom Lehmann: And that certainly brings to life a great example, right, and maybe a little bit different than folks might be thinking about what it is and how again, as you said, immediately applicable it is to our industry and the work that we do—and particularly in a highly science space and in the lab. So that's a great example, so I appreciate that.

Let's take it now down a level of detail then. So the Tech Vision is comprised of four trends. Let's walk through those and, again, continue this conversation around how does it apply to our industry and where might Biopharma organizations get value from it?

Shalu Chadha: I think the way we have to think about how we work is the Tech Vision is really a continuum of the decade of experience that we've had and the trends that we've seen. And we anchored on this Tech Vision in four of the key trends. And as I describe at a high level what they are, we have to think of them as intertwined to actually create the world that I just described a second ago.

So the first trend is WebMe. It's really indexing on extension of what we're all calling in the industry, the Web3. And what the power of actually owning your own identity and tokenizing and being able to use different capabilities, transforming that experience for moving from one world to the other.

Programmable World is the second. What we do today and what we are used to doing with automation and customization has to move from the physical to the digital world that we're talking about. And what would that manifest and look like?

Trend three is what we call the Unreal. I think more than ever, we're so fortunate in the bio pharma industry about the possibilities of AI and data that's had with drug discovery. But with that comes with you're using more and more what we would describe in our context, maybe synthetic data. Sometimes you're using bots in different other and the whole question of what is real and what is not becomes key. And so that's the Unreal.

And then the fourth one is really rounding that with a little bit of—you can't make any of this possible without it—what we're calling Computing the Impossible. The machines, the interaction, the problem solving, what we have

continued to use as new ways of compute and quantum. .

So those are the four from a trend perspective. And what was exciting and sometimes far more surprising to many of us even within the practice, the survey results when the question was posed for our Biopharma clients and executives across many of the clients—bigger, small and indifferent part of the functions and globally—question where do they think Metaverse will have a positive impact on their organizations?
And we were up there at a high of 85%. The real "aha" was the rest of the industry was at 72%.

So, I think there's a lot to be unpacked. There are many of us as executives that really feel in our space impacting what cure and patients could be and what we could do for the wider ecosystem. I think it's so relevant to see what metaverse could actually be as an opportunity.

Tom Lehmann: Yeah, I would agree. Just looking at a little bit of the data, it did seem to be contrary to what we hear as far as just the broader questions out there. As I said before, does it really pertain? Is this really going to apply to our industry? But if you look at the data it would suggest that not only—will it pertain but also that there's an expectation that it will be employed but also really change the way that things operate within our industry.

Shalu Chadha: Yeah, and there's so many of those examples. So if I tease out some of that a little bit and I feel like I'm sitting in this chair of trying to disprove the naysayers—but the exciting part is that there is so much already happening in our industry. And let me try and bring that to life.

So if I take the first trend and that was WebMe. As I said, we are going to have to continue to progress what the internet allows us to do in those persistent share experiences. And it's really going to anchor on how you monetize and how would you look to monetize data and how many times have we talked about patient data and how we could securely, as an ecosystem as

all the parties included—HCPs and Biopharma and wider—and what could that look like when patients ask , "I want to own my data and I want to be safe and secure and know where you're using my data." So tokenization is a real thing that we're seeing.

And then if you take the example of who would I take? I mean I would pick, even in the blockchain space what consortiums are doing today. So if we take Pharma Ledger, squarely in three years ago, in 2020, a consortium of many of the European Biopharma coming together just to explore what could be the possibilities with blockchain. And the latest one they have in the use case is what would you do with e-consent? Allowing for trusted consent process and we want to take away the paper-based and we want to be able to obviously do that securely and putting the power and ownership in the right places and integrating that IoT. So I think WebMe in many ways will just power that world that I just described.

One of the other places I like to pull this together and the teams have different angles of looking at this. We are in a place of experience and worlds and it's about collaboration and what better, a use case or imagine a meta tumor board, right Tom? Where you could have HCPs, medical professionals, everybody being able across the globe to be sharing images, blood tests, patient records—and all of those tokenized, having unique identities of patient data and all of this doing safely and knowing what the impacts of that data could be, and then also using maybe patient avatars that could actually join that Meta board to actually look at and explain their care journey—all in the objective that we're all here for, which is how we're going to cure at the speeds that we've never seen before.

So I think that in itself, when I try and internalize all of that for us in the Pharma space, I think that's like really now and feels like the right manifestation of trend one.

Tom Lehmann: And it does seem as the required enabler, if you will, to the ambition that's out

there that is really bringing together different constituents in the healthcare continuum.

So if you think about the Biopharma organization and the role that it plays, you think about healthcare providers of various different sizes and locations, you think about the academic research institutions, the ability to come together, share the data and have some level of confidence in the quality of the data—but also just the privacy around the data becomes exceptionally important. So it does feel like this trend is really starting to enable that outcome.

Shalu Chadha: You couldn't have said it better. And I think one consideration that we all have to—and we all know, because we work in this industry—is exactly that: what are the controls and what are the safety elements that we're putting in place?
And it kind of comes back to this theme that we have across the board, which is we are going to create these rules along with the ecosystems and we're not going to wait for regulation to take one way or the other. But I think it's about exploring and creating those rules as we define it with all those partners and stakeholders that you mentioned.

And so then if I progress further with where we think we are with the third—and I think I'll put the hat as I keep talking about the trends for what it means for Biopharma—Programmable was the second. Like I said, we're all about how do you take customization, automation that we all know we want to do in the physical world of creating and manufacturing, most definitely. But in the lab and everywhere else, how do you shift that and how do you move that when it becomes the digital or the Metaverse?

I want to talk about some of those examples—take a worker in the manufacturing shop floor in any one of our facilities wearing the AR to monitor the site and then being able to, through that AR, being able to even see where the machine needs, the lab equipment needs repairing. You have a drone coming in already with the parts that needs to be fixed. You've got

ambient camera helping as the worker walks in the floor in the manufacturing for to actually be able to maybe shut down or alert some safety warnings in accordance with all the procedures that we should have. And then lastly, the AR glasses are helping that worker and her actually train herself with the tutorial.

I think that has to be, again, another example of much of the work that we have seen occurring in the industry, whether any of our clients about what they're really trying to digitally enable that continuous manufacturing facility and that experience that comes with it. So that for me is Programmable, anchoring on connected, experiential in the material.

We're going to take IoT and 5G into ambient computing because we have to be able to connect. We have to take the experiential, bringing information with context, informing those decisions that I played out in that scenario. And then what we can do with programmable, 3D printing is here and here to stay in very different ways and just enabling us to make those customizable physical parts and products that we're going to need.

Tom Lehmann: Would you say that… with both of those examples, right. So think about what we're seeing perhaps outside the industry, whether it's AR or the 3D printing as you just mentioned. Is it becoming more mainstream at this point within our industry?

Shalu Chadha: Yes, it's a great story. I think that the short answer is not enough. I think we would all agree that many of our clients, we could have countless examples of some of that.

I think the trick that we're going to have to solve is how do we make it what we would call enterprise-wide and truly embedded? And also the other part is, you're not trying to do the old ways with the tools. You're really trying to reimagine what that engagement model: why should a commercial person or a product engineering person actually have visibility to supply chain? And when they do, what could

that occur and what could you do with that? So you're really thinking about changing the paradigm. So not enough. We could do more.

With that, lot of exciting work happening even in our own drug discovery, we could keep going on and on. I think maybe Tom, Xenobots—the Harvard and the University of Vermont discovered and published—a programmable, organisms being created just assembling stem cells in a petri dish.

And we take that and the explosion of what we're trying to do with, Accenture trying to do with NHI and the Institute of Bio Processing Research and Training, NIBT, up in UK to actually optimize the growth of those hamster cells in a bioreactor to actually produce the monoclonal antibodies. So I think there is an explosion and a lot going on. We have to find a way to harness that and make that truly enterprise wide.

Tom Lehmann: Okay, that makes sense.

Shalu Chadha: All right, so then, moving on to trend three and Unreal. Our study has clearly shown that it was as high as 92% of our executives actually saying we depend on AI in the Biopharma so much. And we all agree that it's going to be pan pervasive. And then, of course, 100% of Biopharma agreeing that there's a growing concern with authenticity, deep fakes, disinformation. And I think that's the new reality we live in. And what do we do about that?

So Unreal is really trying to unpack: how do we explore what are the implications when we talk about Unreal? And I think the work your teams, Tom, have done about the use of synthetic data in clinical trials and helping alleviate some of the burden of the substantial cost that comes with patient recruitment and saving those resources and time is clearly an opportunity.

The 'and' is synthetic comes with the fact that it is synthetic, and we start calling that synthetic realism. How do you determine what's actually

real and what's not?

And I like the way we frame it in kind of four ways to think about it: Provenance. Where did the data come from? What's the history? What's the algorithm wired and how is it working and how does it make those changes. Policy. How is it governed? People. How do you have those governance that ask those tough questions? And then the one I like the most, the Purpose. To be clear and transparent: why are you using synthetic data and for what reason? And what's the context and what's the value? Always anchored and be transparent in that are a couple of the ideas we have there in that trend.

Tom Lehmann: On this one, as we see the movement, is there a part of the value chain where it's more likely to gain momentum quicker? So is this more of an early drug research? Is it a clinical development? Is it a supply chain into the commercial space? Where do you see this playing out and maybe at what pace?

Shalu Chadha: I think where we are from a Biopharma perspective is the use of AI and algorithms, I think we've proven ourselves that's a given, that's how drug discovery is going to occur, whether it's any of the obviously data rich R&D process.

So there is no longer a question of "is it going to be the way to go?" I think that's a given. What I think we're seeing more and more is with the experience side and what that collaboration should do, whether it's our HCPs or wider, and what could we do with AI within the enterprise. We're seeing more and more of that panning out for us in Biopharma.

That's where I feel the industry can do more when we see ourselves against other functions or other industries. And where I go with that, I think Tom is, we do talk amongst us a lot and with our clients, Biopharmas is traditionally a very siloed functional enterprise.

So what R&D does and then hands over the

supply chain and then hands over the commercial, I think that is another opportunity of where we are going to go with the pervasive and where AI and therefore what that could do for the value across the functional boundaries of what visibility you will give to supply chain, to commercial and early research, etc. I think we will all agree is an untapped opportunity.

Tom Lehmann: I think for certain. Right. So within the functions, but also at the boundaries of the seams between those different business functions, there's clearly an opportunity there that is, to your point, relatively untapped at this point.

Shalu Chadha: And the value for what that could generate. And so then lastly, Computing the Impossible. I don't think…again, almost in the same vein, it won't surprise us that the survey shows us much higher across the industries about what computing power can do for our industry. I think an interesting one that I've done so much more research ever since I've got this role to look at our vision is what we're, Tom, calling the "Bio Inspired Computing."

So that's interesting, where we're actually seeing the computer algorithm trends of actually drawing from biological processes. For instance, the way DNA in our bodies actually stores data and how do we actually use biologics processing to solve and create models.

And I think this is the place where we truly believe and advise our clients, Tom, right, which is this is where the ecosystem partnerships and this is where consortiums actually come to life and should because the Biopharma clients shouldn't be thinking about doing this themselves. And so an example I think I can think about is what GSK, AZ and Nvidia are pulling together to create that supercomputer, creating those models for those chemical structures and really with the same objective: how do we accelerate the new medicines with those predictive modeling? Those are where we're going to continue to see there is so much more we could do with the partnerships in this

space.

Tom Lehmann: So if I bring it together: WebMe, Programmable World, the Unreal, Computing the Impossible—as Biopharma organizations consider these four trends, what should they do first and how do they get started?

Shalu Chadha: We are starting to have the dialogue with much of the feedback from our clients in the Biopharma, is let's think about this in three types of steps.
First you're going to do a little bit of education, right? What does it even mean? What's even possible? And allow some immersion. So whatever that experiential education looks like and whatever model that looks like just to explore and ideate.
I think at the right moments enterprises have to be looking at about, "Okay, so where does, how do I get, where could this be used in the enterprise and where could we find the value for our patients, for HCPs, for our own employees and how do I engage and find those answers?" So that purposeful consideration.

And then of course, as many things, I now think, "I have a place, I know what direction the value is, let's start the POC, let's experiment." And we definitely believe, Tom, we as a community, as an industry, we will learn, we will together figure this out and we'll create the rules as I say. But we're going to have to get started and learning along the way just to try and address where you were, Tom, with how do we start even to get started?

Tom Lehmann: It certainly makes sense. And again, I think you mentioned earlier that the industry is not starting from step zero on this, if you will. The progress has been made. There's some really nice examples across all four of the trends and I think with that there's also examples of what has worked and probably plenty of examples of what hasn't worked.

There's also plenty of opportunity to take a look at what's happening outside the industry, which tends to be a conversation we have in this series

around "how do we get inspiration from outside the industry?" And I assume even with these four trends that would also apply here.

Shalu Chadha: Absolutely. Yes. And there's so much more we're learning and I like the convergence between health in general, but also what patient health and consumerization has done to us and then what even MedTech clients are doing.
So yes, I do want to make sure we leave the discussion with, when you consider that journey, I want to anchor back on just ensuring that we can architect even from a cyber security perspective of those new identities and data governance. We can think about what the upscaling of our own people and the talent strategy that comes with that as you think about moving the software developers, of course, in that experimental different skills, but also the design part becoming so important and empowering them to find those pain points in the experience side.

I talked enough about this is going to be the power of the consortium. Our clients should be looking out and looking for that collective response, if you like. And then clearly the partnerships and the ecosystems that come with that, which is part of the success here.

As we create these worlds, we create them together, we define what the world wants to be for yourself and we even define the rules in that very, how should I say this, safe and secure way for our patients.

Tom Lehmann: Yeah, it makes sense. And again, keeping that last point in mind here to say, well, there may be things that are ultimately driven by operational efficiency objectives. At the end of this, the quality products and safe products for patients has to stay front and center on this. And particularly as we move a lot more of this closer to the patient, as we think differently about data, we think differently about the personalization. Keeping that in mind as we go through it becomes really important.

So you mentioned talent, you mentioned the potential for collaboration, the industry coming together, the ecosystem. So the number of different themes which we've discussed on various episodes in the series, what are some of the other barriers or considerations when biopharma organizations are really looking at these trends and really thinking about how do we move forward at scale and really look for the impact—what do they need to be looking out for?

Shalu Chadha: I think as an industry we're kind of in this should the rules be defined by the regulators and should they be telling us what's possible or not? I hear a lot of that.
And so I think we're interacting with many of the regulatory bodies in Europe and here, of course, in the US. So I think there's a framing of what are we trying to solve and take them along with us. So in this place that we know we need to go to, I think it's about partnering with them and defining those with them. So I would call those out.

The second—I'm smiling to myself—is we've got to clearly get some of the foundational accelerated. So how do you think about your architecture and open architecture? How do you think about cloud and the enablement? How do you think about, like we talked about, cross functional and what would you do with your operating model, as we all talk about making those convergences and seams across?
And I still think we haven't done enough within the enterprises with that one.

And I want to anchor maybe on that third one on the authenticity and making it a clear C-suite agenda—the transparency that I talked about, the purpose that I talked about many of these things as you explore different ways to do things. I think in the organization, as we talk about how we want to collaborate with patients, how do we want to work smarter so that what we produce and develop is accelerated and it's still safe, I think we want to make sure we are transparent and authentic about the purpose behind that.

Because a lot of this, this will come with an enormous amount of skepticism, unfortunately, given where we are as a society, with possible downsides of any one of these technologies being used in what I would call the wrong way.

Tom Lehmann: I think it's a fair point. And again, I think it's one of those watch points. As you look into it. And to your point, I think it cuts across all four of them. At the end of the day, you could unfortunately create in your mind and probably not too far from reality scenarios that could play out in a fairly negative way.

But again, the positive potential is significant. I think it's for Biopharma organizations just to get out ahead of that, consider that and plan for it. And with that, I think the opportunity is quite significant for this industry, if done right.

Shalu Chadha: And I think there's a lot of us can figure it out together—and then define maybe some things are not for your organization and you don't want to participate in different ways. But taking the step and experimenting with that lens, I think is clearly the right way to go.

Tom Lehmann: Well, I think we started with a question generally around how does this pertain to the industry? I think you've clearly answered that question.
And I think part of this is just really getting clear around, as you said, that this Metaverse Continuum, there's a number of things along that continuum.

But I think even where we close here, around just being very purposeful and thoughtful around: what are you trying to accomplish with it? How do you consider and work through what could be some of the downside part of this? But with that in mind, recognizing there is still significant potential in our industry and in some ways, we're probably just getting started. So a very good run through, I appreciate the clarity around the four trends and the examples, and it was great again to have you back here as a guest.

Shalu Chadha: Thank you. Tom, you obviously know you're the best podcast, one of the best in the R&D community. So I love being here, and I enjoyed myself. Thank you.

Tom Lehmann: I appreciate that. Thanks again, Shalu.

Tom Lehmann: In our next episode which continues the discussion about the 2022 Tech Vision, we will further explore the impact of the Metaverse Continuum on Research & Development within Biopharma.

There are countless examples of where progress has already been made. However, this is also an area of the value chain with very established and regulated processes and ways of working and with that comes a healthy dose of reluctance and skepticism.
Join us for that discussion to hear how it applies and what's on the horizon.