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DRIVING DIGITAL IN BIOPHARMA

AUDIO TRANSCRIPT

INTRO:

Hello and welcome to Driving Digital in Biopharma. I'm your host, Tom Lehmann.

In this episode, we are joined by Morrey Atkinson, the Chief Technology and Operations Officer at Vertex Pharmaceuticals. Morrey, a scientist by training, has spent most of his career in process development and manufacturing.

He joined Vertex during a significant period of transformation, where the company was introducing new modalities and crafting a new manufacturing strategy.

Our conversation covers the role of digital in scaling commercial manufacturing, the strategic partnership with Contract Development and Manufacturing Organizations (CDMOs), and the innovative applications of augmented reality in manufacturing among other topics.

Thanks for listening and I hope you enjoy this episode!

Tom Lehmann 00:00
Hi, Morrey. Welcome to Driving Digital in Biopharma.

Morrey Atkinson 00:03
Hi, Tom. How are you?

Tom Lehmann 00:04
I'm doing great. Thanks. Thanks for joining today. Before we get started, for the benefit of our listeners, can you please introduce yourself and share a little bit about your background?

Morrey Atkinson 00:13
Sure, sure. Yes. So this is Morrey Atkinson. I'm the Chief Technology and Operations Officer at Vertex Pharmaceuticals. I'm a scientist by training. So I've been working in process development and manufacturing most of my career. Spent a fair amount of time in large pharmaceutical companies. And I joined Vertex just about four years ago as we were going through kind of a major evolution in the company, bringing on new modalities and working on a new manufacturing strategy.

Tom Lehmann 00:45
Great, thank you. So, as we start the discussion here, maybe just a little bit of context, where Vertex as an organization is with its evolution over the last several years. So you've been there for four years, where is Vertex and how is the focus of the organization perhaps changed over the last few years?

Morrey Atkinson 01:03
Well, it's interesting. The company has had a very consistent strategy and business model for quite a while. And one of the fundamental tenants of the company is serial innovation. And the way we do that is by investing really a majority of our OpEx in R&D and innovation. And so by doing that, we create an environment where we can serially innovate on a disease that we choose. And we choose diseases, where the causal biology is known, where they have validated targets, and we can translate the biomarkers from the bench into the clinic.

Morrey Atkinson 01:35
But we're also modality agnostic, so we will work in different modalities. But for many years Vertex has really been a leader in small molecule development, and particularly in cystic fibrosis.

And so we brought several drugs to market for cystic fibrosis and really have changed, fundamentally transformed the way that diseases treated. But that also led us to go to other diseases where now we're bringing new products to market in other therapeutic areas like sickle cell disease, and beta thalassemia, where we have a cell therapy. And so this innovation engine that we've created really has created a pipeline of products in very transformative diseases, where we have different modalities to treat the disease.

Tom Lehmann 02:16
And so with that innovation engine, as you mentioned, that's in place, I imagine that's not only just on the R&D side, but it's now as you said, bringing products to market. If that transition from R&D to manufacturing is happening, what are some areas not only just, I'd say at that transition point, but maybe through R&D, where you seedigital playing a bigger role, or a key enabler to help either set the direction or to enable that direction.

Morrey Atkinson 02:42
Let me tell you first about our small molecule portfolio. Vertex was one of the first companies to commercialize continuous manufacturing of small molecule drug products. And so for our cystic fibrosis programs, we put in place a continuous manufacturing facility where we can make a large amount of material for clinical trials, and then scale very quickly into commercial. So that's a fully integrated continuous manufacturing rig, with online process analytical technology. So it's pretty advanced control systems, advanced software. And we can actually do essentially real time release of our products.

Morrey Atkinson 03:16
All of that was done in development. But we move very quickly from clinical into commercial with that program. And so we have continuous manufacturing rigs producing our products and multiple sites. But it was really enabled by the online kind of digitalization of the information from the line and the ability to scale very rapidly. So that's a really good example of some of the innovation the Vertex has done in manufacturing, even in our small molecule portfolio.

Tom Lehmann 03:43
So just for the for the benefit listeners, maybe compare and contrast that. So if that is what really good looks like, what are some of the limiting factors that that other organizations might be facing?

Morrey Atkinson 03:56
I think one of the things at Vertex is we aren't really dealing with a lot of legacy systems. So we're able to, to bring in technology as it suits our needs. One of the things that we've been working on with R&D is a program called lab of our future, where between R&D and product development, we're harmonizing all of our data, our instrumentation, our notebook systems, and trying to create a seamless end-to-end digital journey for our products as they move from research into development and into commercial. So that's a really good example where we can build something that's fit for purpose for Vertex for where we are today.

Tom Lehmann 04:37
And with that, are you able to move past some of the challenges the industry has faced around decoupling data from the instruments and then therefore being able to really get to that data, as you said, to be able to use it across the process?

Morrey Atkinson 04:50
That's the journey we're on for sure. I can't say we're perfect at it yet. But we've definitely moved the needle significantly on that and we're investing heavily to make sure that all of our sites and all of our data flow together. And we have access to that end-to-end.

Tom Lehmann 05:06
As you mentioned, you're talking about vertex as an organization, where you are disease-led and modality agnostic. When you think about that transition from R&D into manufacturing, where you have a situation where you've got a lot of familiarity with the modality, perhaps, that process development into the scale for manufacturing just gets easier. How do you navigate through that when you are not working on specific modalities, but more agnostic? And therefore what comes to you from R&D might be a little bit more varied?

Morrey Atkinson 05:38

Yeah, I think that's a great question. Certainly cell therapy falls into that category. And you know, most of the cell therapies really were developed kind of as research grade programs, right? That includes all of the cell therapies on the market. And so creating a commercial capable process and system to release cell therapies is a journey. And so we moved very quickly to the market with our cell therapy for sickle cell disease and beta thalassemia.

Morrey Atkinson 06:07
But we have an ongoing lifecycle management plan to make sure that we can deliver that product quickly and reliably and continue to scale as the market grows. So, I think with most products, there's always a lifecycle management plan. I mean, there are products that have been on the market for decades, and most of those manufacturers still have improvement programs. But I think particularly for cell and gene, you know, the first process you take to market isn't going to be your ultimate commercial process. And they'll always be a technical agenda to improve that process, improve the output, improve the throughput, improve the quality, improve the yield. And I think there's a huge amount of opportunity in cell therapies to continue to do that.

Tom Lehmann 06:51
And I'm assuming also in other modalities as well you mentioned yield, , just trying to figure out, "How do I actually improve that yield?" Each iteration or even in your starting transition point from clinical to commercial. Just interested in some things that you've done in that space, or where you see opportunity?

Morrey Atkinson 07:10
I mean, yield's one thing—I mean, reliability is very, very important for cell therapies, and particularly for autologous stem cell therapies, where you take a patient's cells, you do something to them, you manufacture, in our case, we do a gene edit, and then we return the cells to the patient. Reliability is the number one challenge; you need to make sure that the patients get their cells back, that we're able to keep those cells free from contamination, that we're able to have a high-quality edit and return high quality cells to the patient. So that's number one.

Morrey Atkinson 07:40
But then you want to be able to bring the yield up, so that you can assure you're going to make a dose. You also want to make sure that you can do it quickly, so you can return the cells back to the patient in a timely manner. And so those are all areas for opportunity and all of the cell therapies really you start with quality. But then speed becomes very important.

Morrey Atkinson 08:01
And so again there, most cell therapies were developed in research labs. And so those labs weren't necessarily set up to do process development, where you would try to optimize each step of the process and make sure you're getting the best possible output. So what the process development teams do is they deconstruct those processes, and then go back and develop the most robust, most capable process. And then we have to file that with the regulators. The regulators expect that these processes run consistently. We have good test methods and controls. And we have we have a high degree of control over our programs. So for cell therapies, that's very, very new territory, there are new guidances being released all the time on cell therapies and how the health authorities expect us to manufacture them.

Tom Lehmann 08:51
So staying on themanufacturing path, and this is maybe not so much a question just about cell therapies. But more broadly, as you look at the product portfolio. I understand that Vertex and probably consistent with many of other organizations in the industry rely pretty heavily on contract development and manufacturing organizations to really help you with the scale up and geographic reach that you're looking for. Can you just start first, just for the benefit of listeners how does the CDMO network work? How do you establish... what are some of the things that work well? What are some of just the inherent challenges that are there? And then if you get that, we'll get on to a little bit more about what you've done to navigate through that.

Morrey Atkinson 09:31
And Tom, I should probably go back to our strategy that I mentioned upfront. I mean, because we want to invest so much of our capital in R&D, we've really tried to minimize our

own internal manufacturing footprint. So we really rely heavily on external manufacturing partners to help us manufacture our products. We have a very limited amount of manufacturing internally. We just don't want to build a lot of factories. We want to be able to serve our patients through a network of CDMOs.

Morrey Atkinson 09:58
Now in the small molecule world there there's capability and capacity available to do chemical synthesis, drug product production, packaging, etc. And so we have a really robust and reliable supply chain for our small molecule products. For the cell therapies, it's a little bit different, because that's new to everyone. And so we've been working to bring together a network of suppliers for cell therapy, that not only do the manufacturing of the cell therapy itself for us, but also some of the upstream materials that you need in order to do for instance, gene editing. And so that's been a journey together, where we're looking for capable partners, we're working alongside them to really bring this new technology to the market and get it approved globally.

Morrey Atkinson 10:43
For cell therapies, you need to be near patients. And so we've had to think about where those CDMOs are located, and making sure they're proximal to our patients, so we could rapidly get the product back to the patient after it's manufactured. So it's a very different concept. But similarly, we're relying on on global CDMOs to deliver our products.

Tom Lehmann 11:05
So if you look at the small molecule part, which is more the traditional side of this, I would imagine it creates an interesting data challenge for you, where, you've got a network of partners that you're working with, but being able to bring that all together. How have you navigated through that?

Morrey Atkinson 11:20
Yeah, it's still a challenge. I think anyone who works with external partners would know that there's no standardization yet in the industry. So getting data from our partners is challenging. You know, people aren't using one data system, you want to make sure they're secure data transfer systems, you also want to make sure that there's cybersecurity in place to protect the CDMOs. So I think in general, if you have an internal manufacturing plant, you can install your own systems. But when you're working with the network, you're working with the systems that everyone else has. I think, in general, and I mean, no disrespect to CDMOs, they're further behind in the digital journey than some of the manufacturers who have their own plants, because they haven't all invested sufficiently in order to capture data and share it with their partners. I think CDMOs that get ahead of the digital journey will in the long run, be more competitive, honestly.

Tom Lehmann 12:14
If you were to—just stay on that just for a moment—to say what does that leading set of capability look like? versus maybe a lagging set of capabilities at this point? What are you observing?

Morrey Atkinson 12:25
Yeah, it's interesting. I mean, some plants have really good internal systems for tracking manufacturing data, and they're able to capture it and share it. But other plants are still working off paper, their QC labs may be still running, you know, tests with paper records. And so therefore, everything has to be reviewed by the quality team, they're reviewing papers, they're sending them back, etc. Whereas a more a more state of the art manufacturing CDMO would have a much more electronic system, their batch records would be electronic, their QC data would be electronic, and their quality group is reviewing these records electronically, so you move much faster, and much more consistently than on paper. And so again, I think that some CDMOs are investing in that.

Morrey Atkinson 13:24
The other thing is they need flexibility. Sometimes these electronic systems aren't flexible, so tech transfer process changes are more challenging. But that's what state of the art looks like. It's really a fully electronic plant cyber-secure, unable to share data and do review electronically, rather than moving everything through by paper.

Tom Lehmann 13:44

And when that moves from the CDMO, again, in that network, into an organization like yours, maybe just a little bit of an insight around, again lots of discussions around supply chain control tower, supply chain resilience, like what does that look like as you tried to then coordinate that whole network? And maybe talk a bit about what if you can do it what you've done in that space?

Morrey Atkinson 14:06
That's a great question. We actually have a pretty good initiative going right now in our supply chain team to be doing end to end tracking. And some of the suppliers were able to do that, where we're able to, for high value materials, know where everything is all the time. But I would say for some time, some places, we just don't have the visibility into the inventory or the production that we'd like. So the data is a bit lagging. You know, we might have a production plant, but we won't know day to day how much is actually produced and available.

Morrey Atkinson 14:34
I think we're better on the back end on the logistics end in terms of how much we've shipped and being able to manage inventory that way. But I think the whole supply chain universe is moving towards a much more integrated AI driven platform. We're on that journey ourselves. And we're benchmarking against others, but I think that's what supply chain is going. Is to try to optimize your end-to-end supply chain and your inventory with a lot more visibility and planning. Really working on getting really good planning systems, because it's very challenging to go end to end on some of these programs and know how much to produce, and how much this will meet the demand. So I think it's, it's an area that we spent a lot of time talking about. We are putting investments in those places and I know that other manufacturers are also doing this. We talk a lot about it within the supply chain community.

Tom Lehmann 15:26
How much of what you see then, as far as what's happening, starts to get into the AI space, whether it's digital twins, or whether it's other, I'd say emerging technologies suggested, as you said, do better planning or just generally anticipate what might happen or what might go wrong. Lots of hype right now and discussion around AI in its various forms. How is that playing out from what you've seen?

Morrey Atkinson 15:49
You know, I haven't seen as much really hit implementation. I've seen use cases and test cases. But I haven't seen as much implementation yet, in the areas that we're working. I think you're right, there is a lot of talk about this, I haven't seen as much happening. I have started to see things, maybe changing the subject slightly, I've seen a lot more augmented reality. We're using more and more of that now in our training and our maintenance of our equipment. So I am seeing that happen. I know that's been a promise that's been out there for a while. And now we're actually seeing vendors that are starting to digitalize or even video our systems and we're changing the way we do internal manufacturing, to move to a much more, an augmented reality slash video system. But in terms of actually using AI, per se, I still think it's in the concept stages. As far as I can tell, I haven't seen a lot of implementation yet.

Tom Lehmann 16:47
Well and it does seem, if I look across the lifecycle, I think there are, as you said, there's a lot of use cases, there's a lot of examples and experiments, I think really getting to scaled impact. I think we're still waiting to see where it's really going to play out. I think there certainly is opportunity. But as far as again, across the value chain, I think what you are observing is I'd say what I'm seeing across the rest of the value chain at this point.

Morrey Atkinson 17:08
Yeah, we talked about it. And we talked about, you know, can we create documents using large language models, but how secure is the data? So I think a lot people are thinking... I do think there will be an impact. And we will start to see selective things trickle into implementation. Also, remember, we're regulated, and we have to be able to justify all of our electronic systems, we have to submit our software validation along with our dossiers. So for our cell therapy tracking systems, those are submitted and reviewed by the health authorities. So that's a whole new ballgame when they're regulating not only your manufacturing process, but the electronic systems that you're using to track your program.

Tom Lehmann 17:47
Yeah, it does create another level of complexity in there. Let me come back to your point about augmented reality, because I've heard a variety of different perspectives on this. And one of the challenges right now is, how do I actually fit this into the lab space or into the manufacturing space? Some of the devices that are out there are not as human centric as perhaps they need to be, really trying to figure out what am I trying to augment? And what does that actually look like when I've got potentially sterile places that I'm working in or certainly very sort of clean areas that I'm trying to work in—maybe we come back to that a little bit more of what you've seen in that space, and maybe what you see on the horizon for that particular type of technology.

Morrey Atkinson 18:29
Yeah, I can tell you what we're doing now. I mean, for our maintenance, particularly, I was talking about our continuous manufacturing line, we now have the ability, when you're looking at the rig to see all of the components and parts that go into a given assembly. And then you can go in and you can choose a part, let's say it's an O-ring or a valve. And you can point at that part, and it says, "Oh, this is part number XYZ, it's in the warehouse and Bin number F." You can go get the part and then you bring it in, and then visually, you can see how to reassemble that component on the rig.

Morrey Atkinson 19:03
So we're implementing this now in our in our plant in order to have a very visual representation rather than having to read, you know, a disassembly or an assembly SOP. And so it's very visual for the operator or the maintenance person, they can see what they're looking at, you know, it glows, it's highlighted on the video, and they're able to go back and find the part and put it back in place. And it shows them how to do it. It's very visual. And adults learn by visual learning, right? We don't learn necessarily by reading. So I find it really intuitive and really interesting. And we're moving that through our training program.

Morrey Atkinson 19:41
You talked about aseptic processing. We've not implemented this, but I think one of the key things when you're doing aseptic processes is contamination control and you know, avoiding any kind of microbial ingress. So I have seen demos where you can do augmented reality and show where potential points of ingress of contamination might happen. and how to prevent them. And so I feel like at least that's a really near term opportunity where the technology is actually catching up to where we need it to be.

Tom Lehmann 20:11
And do you see that then paired off, you mentioned before my lab of the future, paired off with rethinking the physical space in which people work? And therefore, it's not just bolting it onto maybe what you've had historically, but actually rethinking what does that physical space look like?

Morrey Atkinson 20:27
Yeah, I could see that. I mean, I don't think we're yet designing our plants 100% with augmented reality, though certainly, you know, most of our big capital programs have some type of, you know, CAD, 3D rendering, you know, layout, etc., that we've been able to do when we build new facilities. We're building a facility with a partner nearby, and you can walk through this plant, you know, virtually, and see where the equipment is going to go. And we're probably problems are. I don't know that we're designing the facility now taking that into account, like, you know, a virtual worker working virtually robotically, or anything. I think we could get there, I think under other industries might be further along. We still, even in our continuous rig, there's still a lot of opportunity for the operators to interact with the equipment directly.

Tom Lehmann 21:15
You mentioned the operators and we touched a little bit on the human side of all of this, maybe we'll pivot and just maybe go down that path to say, as you think about maybe the last couple of years and just as you've seen technology evolve and the role that it has played. How have you considered the human element—whether it's learning, as you mentioned, or just the need for a different set of skills? Maybe just interested in your perspectives around how have you approached the human side? And maybe some of the challenges that come along with that?

Morrey Atkinson 21:16

You know, it's interesting, I would say current workforce are more used to technology than maybe when I entered the industry, right? So if you hand somebody a paper today, they might be early career, they're probably much less used to writing on a piece of paper than they would be, say, on a tablet. And so even doing what we call paper on glass is more comfortable for the workforce of today than just doing everything by paper. I mean, when's the last time you actually wrote something on a piece of paper.

Morrey Atkinson 22:23
But I do think what we're finding is, as people move on in their career, if they aren't digitally savvy, or don't know the systems, we start to end up reverting to manual work, which doesn't help us any. So some of the systems we have, I think, as an industry, we may not use them to their full capability, because we're just kind of surface users.

Morrey Atkinson 22:44
So I think it's really important as we think about talent and we talked about digitalization, starting to think about either developing the skills within the team and teaching and training people to be much deeper super users of the of the systems, or actually bringing people in that have some experience in those systems.

Morrey Atkinson 23:04
One of the problems is you don't want things to be so complex that you need an army of automation engineers to make a change, right? It needs to be accessible to the common person. And so the digital interface, the user interface, user requirements, are incredibly important. And I think that's, that's something that maybe the workforce hasn't kept up with the technology.

Tom Lehmann 23:25
And I think we're seeing that across different parts of the industry. As you said, I think the technology is evolving at a pace that is, is at this point, going faster than many organizations. And so I think you've got, as you said, people who are entering into the workforce or earlier in their career, are more naturally, in a lot of places picking this up. Those that are that are used to ways of working, perhaps they were paper based, or just more legacy ways of working, are at times having a tougher time making that transition. And that goes again, back to our point about augmented, whether it's augmented reality, augmented work in some form, it's really helping people on that journey, is proving to be the second challenge here. Whereas maybe it's not a technology problem. It's in some ways, it's a scale problem or a cultural problem in some places.

Morrey Atkinson 24:08
I think the other thing that I see still happening is the technology team, we call ours data, technology and engineering, other people call them IT, that team knows their systems, but then you have the business people that know their processes. But the connection between the people that know the process and the people that know the technology is still not as strong as it needs to be. And so I'm always encouraging people, people from the business to go work in their IT organization or the IT people to make sure they spend enough time with the business on the floor in the lab, really understanding how work gets done. Because often you feel like it's the tail wagging the dog right? And you really need the user IT interface to be really tight.

Tom Lehmann 24:57
Absolutely. And I think you've got a couple different ways to get there, right? As you just said, you can encourage and really help to facilitate that; you've seen some organizational shifts that actually move those two groups closer together. But the bottom line, the technology in the context of the business is something that I'd say, broadly speaking, is an opportunity, I think, again, across the value chain. I don't think it's unique to your space, but certainly seeing it in a number of different areas.

Morrey Atkinson 25:20
I will tell you that I do notice when there are team members that are particularly savvy with digital systems. They tend to be people that that do well, right, we give them opportunities, they tend to be able to take on responsibilities, they tend to be able to work at those interfaces of the software. I think for people thinking about career development, being savvy and competent in digital systems, I think it's going to be an enabler for people to develop in their careers going forward.

Tom Lehmann 25:50
Well again, it's almost we expect people to be bilingual, in some form, bilingual part is technology. And part is that the business process or the function they're working in, and the ability to bring those two together will, as you say, will be a key to long term success.

Morrey Atkinson 26:04
100%.

Tom Lehmann 26:06
So, as we spent some time here looking about where we're you've been, where Vertex has been, what's happening today, let's do a little bit of a future gazing if we can. So as you think about the role that digital is playing, or may play, what's on the horizon? What's going to create a step change in a business outcome that really matters in the area that you work in.

Morrey Atkinson 26:30
I mean, I talked a little bit about quality. I think, if we can review and release products almost in real time within a network of manufacturing sites, that's going to make a huge difference. It's going to make the lead time faster, it's going to bring the quality up. A lot of the problems in quality are human error. So they're deviations, they're problems. You know, they're mistakes that people make. So I think it could really change the way end to end products are manufactured and released.

Morrey Atkinson 27:04
I think we often talk about being able to create documents, reports and regulatory filings. If we get to the point where everything is integrated, we might be able to create regulatory filings without a lot of human writing happening. Now, you know, there's always a story to be told ina regulatory document, you know, you interpret the data one way you want to make sure the regulator's see your side, but there's a huge amount of information in a regulatory filing that most likely could be digitalized, and even composed, edited, by large language models. So, I think that's a possibility. Again, it's very risky, it feels risky today, you know, when you write and review regulatory documents, but it does seem like it should be achievable. It seems like something that the industry should be able to do.

Tom Lehmann 27:53
Well, and it does feel like how document heavy, you mentioned, for the how right regulated right in this space, how document heavy the entire R&D process is, or at least the development process, and certainly as you get into the manufacturing side of it, it just feels like it's ripe for opportunity here, that there's something that can happen here. Maybe it doesn't 100% replace it, but can you dramatically reduce the amount of work effort and give somebody a really good starting point to then take a look at as opposed to having to do a lot of what feels like very manual work at this point in time.

Morrey Atkinson 28:22
Yeah, I mean, we're filing regulatory dossiers all over the world for our products, right. There are country specific requirements for labeling and every country's health authority, you know, gives you some feedback. But if you could harmonize all that, and be able to create documents that are specific for filing in Uruguay versus a filing in Estonia, that would be amazing. Because right now, there's people doing that work. And they it's not just the big markets, but it's global markets and serving patients all over the world. And to be able to file those dossiers, maintain the regulatory compliance, and get changes approved globally, you change a method on a product, you have to file that in all the markets that you're selling the product in. And that's a huge amount of manual work for people to do. And I think it's just ripe for the type of AI driven activities, as long as we can reliably create, you know, valid information, I think it would be a game changer.

Tom Lehmann 29:20
And do you think that's a, one to three year, three to five year, five plus? If you were to, if you were to best guess on it based on where you think things are right now and what's what technology is available...

Morrey Atkinson 29:31
I mean, I know I've been talking to you guys at Accenture about this for probably six or seven years already. So if you would have asked me back that I would have said, "Oh, it's right on the horizon." I think again, as a regulated industry, we're pretty slow to act and people just been doing things the same way all the time. And so

it's also your dislodging a lot of kind of industrial inertia—but the capabilities are there. So, you know, do I think we're going to move fast, you know, maybe another five to 10 years. I think maybe some good use cases where we see it work. People see success, they see no failure. That's the other thing. You don't want to do this and then find out you have a regulatory filing rejected because your AI system, you know, messed up the filing. That's not going to win anybody any kudos. So I think we have a risk aversion in our industry that's probably based on, you know, the downside of making a mistake.

Tom Lehmann 30:28
Right, which given what we're doing makes sense, right? You understand where it comes from. And maybe at some point you need to see, and maybe it's a smaller regulator, who is more inclined to say, listen, we're willing to move with you at the same pace. And maybe at that point, some of the larger regulators then take notice, as opposed to assuming it'll be one of the big ones that will move first, in this space, as we try to work our way through this.

Morrey Atkinson 30:52
Yeah. Or you build it from the ground up, and you start from when you know, you know that this is how you're going to do it, and you move it carefully through on a given product or on a given platform.

Tom Lehmann 31:03
Yep, indeed. Are there other big trends in the horizon you'd want to cover?

Morrey Atkinson 31:20
I mean the only other thing is, you know, we're looking at just repetitive tasks internally that people do and trying to automate those more and more. And I think that's, that's probably true for every industry, right? Where we do have the opportunity for AI and automation to really free us up from things that today we have people doing, but I think that's not that unusual. I think most people are dealing with that.

Tom Lehmann 31:44
I think part of this is really trying to figure out again when you're looking at those repetitive tasks is which ones are worth focusing on, based on the investment to do something versus the cost you're gonna save at the time that you're gonna gain. And so it's trying to find that balance between investment and the return on that investment?

Morrey Atkinson 32:03
100%.

Tom Lehmann 32:05
Alright, well good. I appreciate the conversation. Again, it's helpful to understand your role at Vertex in the context of where Vertex as an organization is, obviously there's been a lot of movement and investments in the space to really progress things, digital is certainly playing a role. It's one of one of many things in this but really appreciate your perspective today and you joining.

Morrey Atkinson 32:28
Well, it was really, really good talking to you. Thank you for the opportunity and check back in and you can find out what we've accomplished.

Tom Lehmann 32:35
We will do that. Thank you!

OUTRO

A big thank you to Morrey for joining me in the discussion today. Reflecting on our conversation, digital plays a crucial role in scaling commercial manufacturing.

An example of that is Vertex's use of continuous manufacturing for small molecule drug products. Furthermore, augmented reality is being utilized in the training and maintenance of equipment, providing visual representations for operators and maintenance personnel, with promising future applications.

As this episode concludes, a few questions to consider:

- How can the pharmaceutical industry balance the need for innovation with the challenges of regulation and risk aversion?
- How can companies navigate the challenges of data integration and harmonization when working with external manufacturing partners?

- What is the potential impact of AI, automation, and augmented reality on the pharmaceutical industry, and how can companies fully utilize these digital technologies?

Once again, thank you, Morrey, for sharing your perspectives with us.

As always remember to like and subscribe to Driving Digital in Biopharma on your favorite podcast platform so you don't miss an episode.

Until next time…this is Tom Lehmann with Driving Digital in Biopharma.