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GSK CTO, Boehringer Exec On The Metaverse And Pharma's Foot In The Door

GSK Has Seen ' Lot Of Success' With Bots

by Anju Ghangurde

Big pharma executives discuss the transformative potential of the metaverse in the life sciences segment and how things are shaping in the virtual world amid the hype. GSK's senior VP and chief technology officer outlines to *Scrip* gains made deploying digital twins and bots.

As the metaverse, the next iteration of the internet that encompasses and converges virtual reality (VR) and physical reality in the digital space, promises to change the experience of stakeholders across the healthcare sector, pharma appears keen to be part of what could be the next big thing.

Senior executives from big pharma signaled at the recent BioAsia conference, how industry is moving when it comes to the metaverse, though the field is still evolving and a long road lies ahead. Training and education figured among the most discussed applications, while the emotional connect, potential in mental health and digital twins were some of the other key talking points.(*See side box*)

Like with the arrival of any new technology that comes with "lot of hype, then becomes a buzzword" and then reality dawns, metaverse too may still be

Metaverse And The Emotional Dimension

The BioAsia conclave also heard Philippe Houben, *Boehringer Ingelheim*'s head of Go-to-market and digital transformation, IMETA [India, Middle East, Turkey, Africa], discuss the opportunity the metaverse provides to drive an emotional connect with patients and caregivers.

"What I am fundamentally seeing is a

on the hype cycle but is fast converting into reality - “not that far in the future”.

“The hype cycle is getting smaller and smaller because adoption is going pretty fast,” declared Agam Upadhyay, senior vice president, Chief Technology Officer, *GSK* US at the BioAsia conference in India. (Also see "*BioAsia 2023: Leaders from Novartis, Apple Talk Innovation, Tech, Data Privacy*" - Scrip, 28 Feb, 2023.)

Upadhyay highlighted some of the early use cases for most pharma organizations including GSK which went into the “total experience” aspect of it, improving the experience, for instance, when new employees are being onboarded maybe in manufacturing or the supply chain.

For example, when a new operator is being hired, it could entail creating a digital twin that provides exactly the same immersive experience for the operator to be trained, rather than to have the individual trained on expensive machines, while also factoring in aspects such as down time.

“That's a huge win from multi-perspectives - the speed, you're not really impacting the business and also creating a lot more simulation for the operator to deal with, which is sometimes very difficult to do it in the physical world,” Upadhyay explained at a session moderated by Ram Deshpande, partner, digital transformation, at EY.

Compliance and regulatory training could potentially similarly benefit from such immersive virtual world experience, he indicated.

difference when we talk about metaverse is the virtual reality - that is allowing experience not with the brain, but with your heart, an engagement with someone like if you are physically present,” Houben declared at a session moderated by Ram Deshpande, partner, digital transformation, at EY.

Houben expects a 'huge difference' in the way industry can engage with patients or the caregiver by bringing them through that immersive experience.

“We are experimenting [with] this and we do see a huge impact of bringing that emotional dimension within the way we are engaging with the patient. So it's a technology that is enabling those kinds of engagements; that emotional dimension is to me the game changer from a technology perspective,” the BI executive said.

Houben explained that patients don't always understand their disease progression and that could, among other reasons, impact adherence to treatments; similarly caregivers too may not understand these critical aspects.'De-mystifying' disease progression is important.

While industry has typically thus far tried to explain things using graphs or testimonials of patients, “the metaverse could allow us to experiment - how will disease progression impact my daily life?; it also allows us to explain that better to physicians and other caregivers”.

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New Dimension On Knowledge Sharing

EY's Deshpande touched upon how the metaverse could potentially improve complex medical training markedly.

"Imagine a situation that the doctors are trained on a heart surgery, and somebody, with the immersive experience in metaverse, can actually get the feel of the heart. You can take the heart out of the cavity and get a 3D view of the heart and then actually identify where interventions are needed," Deshpande stated.

That would then make the "process of education as well as training far more efficient, while also improving the quality substantially," he added.

Experts have similarly highlighted the metaverse's potential to be a "game changer" more widely in the education industry. Gustavo Kesselring, vice president, external affairs, at the International Federation of Associations of Pharmaceutical Physicians and Pharmaceutical Medicine (IFAPP) Academy, recently said that the intrinsic nature of the metaverse opens the door for "a new dimension" of how knowledge can be shared and measured.

"In the near future, its gamification features can be used to transform the way we have taught and evaluated for more than a hundred years, and the early adopters will benefit the most," Kesselring asserted last month at the launch of metaverse capabilities by Indegene, digital-first, life sciences

He reiterated the role of the emotional dimension, "because I would say it's much more powerful than explaining something to someone - let them experience it".

In areas like mental health, the metaverse can potentially provide an environment where you can feel safe, because you're somewhat anonymous. "So there are some very specific use cases where the patient will see the benefit not to be physically in front of a human but to have a safe environment; besides distances [to access appropriate care/treatment] in India and a lot of emerging markets is a huge topic," he said.

While, VR, augmented reality (AR) and mixed reality have been deployed over the years to treat mental health disorders, there are concerns, on the flip side, that excessive time spent in 3D immersive games as in social media could itself lead to addiction, anxiety etc.

Last year, an article in *General Psychiatry* noted that living in a world within the metaverse could potentially lead to the worsening of specific mental health disorders, though with the anonymity of the virtual realm, more individuals may feel comfortable sharing their stories with professionals and others facing similar issues. "Hence, this rapidly expanding technology could significantly improve access to mental healthcare, especially given the present acute shortage of mental health professionals," the authors Usmani SS, Sharath M and Mehendale

commercialization company.

Last year JPMorgan said that it expects the metaverse to likely infiltrate every sector in some way in the coming years, and referred to estimated market opportunity of over $1 trillion in yearly revenues.

Digital Twins, Extended Reality

Importantly, GSK's CTO also noted that studies suggest that retention is longer with training done in a "very immersive manner" versus when it's done via the traditional approach.

Upadhyay told *Scrip* that the metaverse concept has the potential to "change the world we live in with mixed reality" and there are really futuristic ideas and hypothesis, but for now specific examples where he sees things coming together are digital twins and XR [extended reality] devices.

With digital twins, GSK is eager to see what companies like Dassault Systemes produce around creating a digital twin of the human body.

"There are many aspects of our data science work that border on the digital twin concept. We must simulate the human body, simulate molecules, simulate aspects of physics, in order to accomplish our R&D objectives," Upadhyay pointed out.

Dassault Systèmes essentially creates virtual twin experiences of the real world with its 3DEXPERIENCE platform and

M said.

The metaverse has impressive potential for many segments of society, but only time will reveal how its future unfolds, they added.

Houben, however, asserted that the metaverse is "not settled, it's an evolving animal and is permanently evolving", implying that it's difficult at this point of time to define a strategy that you could be looking back five years from now and determine whether you could achieve it or not.

"So beyond being curious, I would say be brave, because a lot of people would be doubting about the interest," he said.

Industry for instance shouldn't expect "a million physicians" to come onboard immediately, he explained, adding that "we are into a phase that you need to be brave, you will have to experiment/convince and as much as possible link your experiments with your business use case, because if you can demonstrate to your senior management, this is the way to be better and that's not only about technology, they will be listening to you." (Also see "*Boehringer Ingelheim's Formula For Scaling Transformation, Digitization*" - Scrip, 27 Sep, 2022.)

Nevertheless, ultimately, if the end users are not convinced of the benefits of such new technologies, "you can be trying, pushing, you will not be successful. So the question basically is that are the HCPs ready to go

applications, with customers spanning many industries. Last year *Sanofi* struck a deal to use Dassault's 'Made to Cure for BioPharma' industry solution experience based on the 3DEXPERIENCE platform to design, implement, qualify and operate modular production lines at its two "Evolutive" facilities in France and Singapore. (Also see "*Sanofi's Triomphe On Vaccine Plants Of The Future, Regulatory Speed*" - Scrip, 21 Apr, 2022.)

there, are the patients willing to go there? "

The potential of digital twins is recognized across many sectors and experts from EY in a recent blog post noted that with enough data, the digital twin model can be "realistic and accurate enough" to run simulations with real-life value.

In the clinical trials arena, using a digital twin could allow much quicker and safer trials, which would bring much-needed drugs to market more quickly, and also save costs, EY's Maximilian Schmidt, Metaverse Lead and Benjamin Banusch, Disruptive Technologies Lead, both in Switzerland, said in the post.

"In the metaverse, you can also separate organs or physical systems from the overall organism, enabling a more nuanced approach. Pharmaceutical companies are already exploring how to create an exact digital twin of a human body so it seems likely that virtual clinical trials will soon be part of the clinical testing landscape," they said in the post last November. (Also see "*Janssen's Sarich: Randomized Controlled Trials, Real-World Evidence Go Best Together*" - Scrip, 4 Oct, 2021.) (Also see "*Ex-Amgen CIO McKenzie: 'We All Have To Think Like Software Companies'*" - Scrip, 27 Sep, 2021.)

Smart Manufacturing At GSK

Digital twins are also important components of GSK's 'smart manufacturing' strategy; there have also been gains on the supply chain front.

In 2021, GSK announced a successful proof-of-concept of a digital twin approach for vaccine manufacturing with Siemens and Atos, which uses machine learning (ML) and modelling to provide new insights for optimizing the development and manufacturing of vaccines.

"Given the promising results from such partnerships, progressing smart manufacturing is a primary business objective for our function. We will combine advancements in edge computing, IoT, hyper-automation, and artificial intelligence/ML to achieve this. By combining all of them, we can get even more value out of our digital twins," Upadhyay explained to *Scrip*.

In the supply chain area, in addition to segmentation, GSK had piloted digital twins to optimise planning and increase operational efficiency and also invested in technologies such as Resilinc,

a tool using AI to highlight emerging supply chain risks. "Reliability of our supply has improved from a median performance of 95% on-time, in-full in 2018 to 97% in 2021, " the company said earlier, adding this was despite COVID-19 disruption.

XR Devices And Training Modules

For XR devices, there seems to be significant traction, with Upadhyay noting that the company had "accomplished a lot" in the vaccines business around virtual reality training.

GSK has built over 200 training modules, which not just saves the company training time but also doesn't require "taking expensive machinery offline so we can train people".

These trainings have seen "huge adoption", with "great feedback", the executive indicated, adding that its almost "like a foot in the door" when it comes to metaverse in life science organizations. (Also see "*Early Days For The Metaverse In The Life Sciences, But Experimentation Is Happening*" - In Vivo, 12 Oct, 2022.) (Also see "*Doing It The Nike Way – Novartis, AstraZeneca On Making The Metaverse Work*" - Scrip, 12 Oct, 2022.)

"Ultimately, these building blocks will come together over time, and we'll see what the metaverse becomes. We start with VR, but we are moving towards deeper immersion and integration."

Progress made by GSK in deploying bots is another area Upadhyay touched upon (*See Side box*)

These initiatives also align with GSK's

GSK's Success With Bots

GSK's senior vice president, Chief Technology Officer, Agam Upadhyay, also outlined how the company had effectively deployed robotic automation 'bots' in some part of the business to enhance efficiency.

The executive told *Scrip* that the company had seen 'a lot of success' with 'bots' – both robotic process automation (RPA) and conversational AI.

"Using RPA, we were able to automate processes that couldn't be easily automated. In vaccines and elsewhere, RPA bots saved many hours of manual work," Upadhyay explained.

In 2020, GSK indicated that it had deployed robotic automation 'bots' across the vaccines business, including in manufacturing, quality and R&D; 76 bots had been deployed by the end of 2020, increasing efficiency and delivering cost savings, it said at the time.

Upadhyay added that he is currently excited about the opportunity for hyper-automation, as these RPA bots can programmatically access systems that couldn't be accessed before – basically enabling APIs [application programming interface] on top of legacy systems.

wider overall purpose to unite science, technology and talent to get ahead of disease together, with an aim to positively impact the health of 2.5 billion people over the next 10 years.

None of that can happen without the support of technology, Upadhyay emphasized.

> "Hyper-automation can enable us to move beyond just automating manual processes, and instead transform our business processes to be touchless, and even AI-driven to deliver medicines to our patients faster," he said.

"This is the area where we are naturally leveraging on technology, whether it's AI in terms of target identification or bringing metaverse in terms of how we can run our supply chain more effectively, or launch a product successfully or interact with HCPs more effectively," he said.

Adoption Will Grow As Technology Evolves

The BioAsia session also saw executives underscore the importance of effective data governance/privacy and ensuring that patient data is safe and secure, while challenges around data portability and the limited inoperability among virtual worlds need to be tackled alongside. (Also see "*Indegene CTO On Pharma And Blockchain's Promise Of Better Accountability, Trust*" - Scrip, 9 Sep, 2022.)

EY's Deshpande closed the session noting that the metaverse is an evolving space and the future of the Internet and can accelerate the whole care delivery process - right from drug discovery, clinical trials to the actual delivery of the care; it provides a platform for people to seamlessly share information and still maintain their identity as well as ensure that data is secure.

"When organizations are adopting it, pick the right pilots, the right use cases but think big, be bold - the technology/platforms are there. As the technology evolves further, adoption also will grow," he signed off.