



# The metaverse and healthcare

## Applications in therapy and wellness

### Healthcare: On the cusp of a revolution

After the COVID-19 pandemic, consumers have become very conscious about their wellbeing and are focusing on following a healthy lifestyle. In seeking to cater to evolving customer needs, it has become imperative for healthcare providers to deliver offerings such as telemedicine. Emerging technologies like the metaverse promise a better experience for patients as well as caregivers. We look at how the metaverse can unlock new paradigms in the entire healthcare value chain.

## Shift from cure to holistic wellbeing

Modern day healthcare providers are not focusing on providing a cure for an ailment. The goal today is to build a long-lasting relationship with the patient before their health deteriorates. Therefore, healthcare providers are looking at ways that involve them in the patient's healthcare journey in some capacity. Moreover, providing integrated solutions has become the key: There is a greater emphasis on providing diagnostics, checkups and surgeries under one roof. This prevents patients from having to go to different healthcare providers to get their blood tested, undergo a surgery or get an X-ray.

As a result, patients now expect to have deep, personalised relationships with their healthcare providers. This has given rise to the field of digital therapeutics which uses software-based programs to prevent, manage and treat health conditions. Here, technologies like augmented reality (AR), virtual reality (VR), mixed reality (MR) and Web 3.0 will radically change the way a patient interacts with the healthcare ecosystem.



# Applications of the metaverse in healthcare

## Telemedicine

During the COVID-19 pandemic, several VR-based applications were used to simulate the real-time spread of the Omicron variant. The solution provided an immersive experience to healthcare providers through a digital twin of the environment. Digital twins of hospitals have also been created, which enable treatment without patients physically visiting hospitals.

## Education

Medical personnel are being trained using VR. The immersive and interactive experiences improve overall training quality. Hands-on training in first aid, nervous system assessment, surgical simulations, and awareness and research programmes can be provided. Precise anatomical reconstructions can also be created. This provides an opportunity to standardise education and training across the world, regardless of time and location.

## Therapy

Mental health therapy is one of the most promising use cases of the metaverse in healthcare. It is possible to get therapy in both physical and digital spaces. Patients can be treated for conditions such as agoraphobia and psychosis in controlled environments by exposing them to situations that increase stress. Early experiments with a VR-based therapy approach have shown promise in adverse situations. Creating support groups in the metaverse has also proven beneficial. These support groups emulate the setting of a real-world support group with medical professionals and patients involved in interactions.

## AR-based surgery

AR-based surgery involves visualisation of the human anatomy in real time. Although it is still at a nascent stage, it helps in guiding surgeons. For example, tumours can be found using 3D projection of the anatomy of a patient. This is helpful because every individual's anatomy is unique. In urology, innovative AR/VR-based devices are used in surgical processes. These devices can provide an understanding of normal and abnormal anatomy.

## Clinics

In a digital clinic, patients and physicians interact with each other virtually. Digital avatars of both patients and the clinic staff can be created for such interactions. Through VR, patients can interact in virtual hospitals, clinics or therapeutic environments. There are no barriers of language or distance, and patients can seamlessly interact in physical and virtual environments.





## The road to metaverse adoption

Adoption of the metaverse in healthcare poses certain challenges. Some of them are:

### Data privacy

One of the biggest challenges to metaverse adoption is data privacy. Patients aren't comfortable sharing sensitive data with healthcare providers. They need transparency to establish trust with the caregiver. However, data is essential for better patient care, and breaking this barrier will require time and patience.

### Network connectivity

The metaverse requires ultra-high-speed internet to provide connectivity in real time. Penetration of 5G and potentially 6G would be essential for healthcare democratisation. Currently, graphic processing units are required to process incoming data streams because of data latency. Affordable 5G and 6G technology would make it possible to stream data seamlessly and ensure smooth remote connections.

### Hardware

Perhaps the greatest challenge with metaverse adoption in healthcare is the need for sophisticated infrastructure. Users control their avatars using VR goggles in several metaverses today. Despite the launch of new devices, affordability and portability stand in the way of adoption.

### Inaccuracies in models

Healthcare is a domain in which there is no room to make mistakes. Using inaccurate 3D anatomical models during surgeries can lead to serious risks. Moreover, creating a simulation is challenging as it requires the involvement of several subject matter experts from both technology and healthcare. Therefore, there is a risk of wrong data being fed to simulations and the resulting simulation being inaccurate.

### Support for visually impaired patients

Patients that are severely impaired visually might not be able to appreciate content fully in 3D or VR. Customised solutions that incorporate better hearing aids would be required in these cases.

## Synergistic approach to healthcare using emerging technologies

The metaverse doesn't work in isolation – AI, the internet of things (IoT) and edge computing are some of the other technologies that work with it. Medical devices with IoT have found acceptance across the globe to monitor vitals and other critical information. For example, with historical data in place, doctors working remotely can track patient health and come up with interventions accordingly. Analytics supports decision making in this case.

In conclusion, emerging technologies will have a huge role to play in enabling universal access to healthcare. Healthcare organisations need to evaluate use cases through which they can provide accessible care to all. Using digital technologies across different touchpoints in the patient-caregiver journey is one possible solution.



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