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**Smarter
 technology
 for all**

Transforming Healthcare with Digital Twin Technology Powered by Lenovo and Intel®

The emergence of digital twin technology in healthcare holds great promise for improving the lives of entire populations. Given the challenges and pressures of the industry's new normal, providers can adopt digital twins to improve personalized medicine, healthcare organization performance, and new medicines and devices. The technology can also enable health organizations to operate more nimbly while continuing to meet the highest standards of quality patient care .



Gartner Inc. predicts that by 2025, 25% of healthcare delivery organizations will include formalized digital twin initiatives within their digital transformation strategy.¹



Powered by vPro® Enterprise for a world-class Healthcare PC solution

Digital Twins Defined

Digital twins are highly complex models that use artificial intelligence (AI) and large amounts of digital and physical data to accurately mimic a real-world object. Digital twins have been built to represent and understand several things from regions and cities to processes, devices, systems, and people.

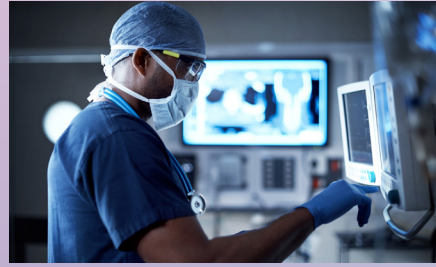
While still in its infancy, the field of digital twins is expanding rapidly with advances in real-time data feeds, machine learning, and AR/VR. In hospital design and patient care, digital twins actively play a crucial role. The industry can implement strategies from manufacturing, smart cities, and aerospace/transportation that are successfully leveraging digital twin technology to improve productivity and development.

Use Cases for Digital Twins in Health Care



Bed Occupancy

Inaccurate occupancy predictions can seriously impact population health. Digital twin technology allows for better predictive analytics based on internal and external data.



Medical Device Utilization

Digital twins can help providers see how connected devices are performing and being utilized in real-time. What's more, the technology can alert providers of needed repairs before a critical breakdown occurs.



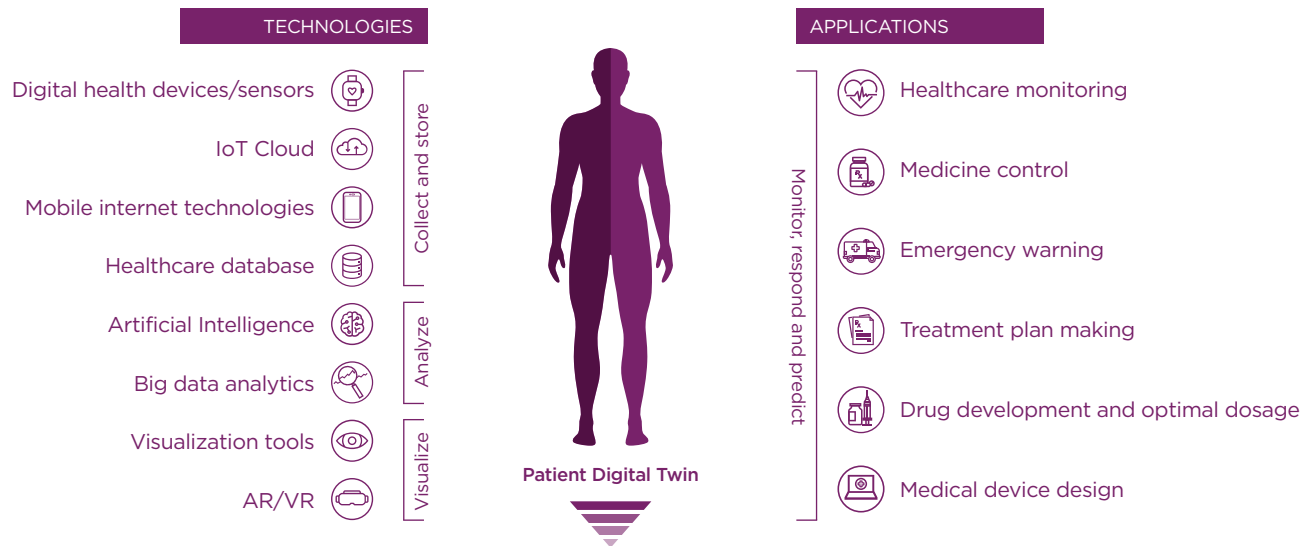
Patient Simulations

Digital twins created for each patient's body, physiology, and medical history can enable more precise treatment testing, further realizing the promise and benefits of personalized medicine.

The Benefits of Designing a Digital Twin for Healthcare

- **Increased Accuracy.** By creating digital twins of a particular organ and eventually, a patient's entire body, scientists can study diseases more accurately.
- **Reduced Labor Costs.** Using digital twins as replacements for patients in research scenarios, operational planning and more can help hospitals save money and personnel costs.
- **Improved Communication.** The use of digital twins can allow medical staff to communicate and collaborate with each other more effectively no matter where they are – another cost-saving feature.

Fully realizing the promise of digital twins brings the healthcare industry much closer to connected care revolutionizing the way in which we manage health and wellness.



DIGITAL TWINS ALLOW: Real-time information interchange between physical and virtual copy of the patient/object/environment
Use of data to predict individual patient-specific evolutions

Digital Twin Promise Powered by Lenovo and Intel®

Equipping a healthcare organization for digital twin utilization requires technology investment. Trust Lenovo solutions with Intel® architecture for:



IMPROVED COLLABORATION

Reliable hardware, software, and services are designed to drive the high-level collaboration needed to fully realize the potential of digital twins in the healthcare space.



PREDICTIVE MODELING AND ACCELERATION

AI software products like Intel® Optimization for XGBoost significantly speed up model training and improve accuracy for better predictions.



IMMERSIVE TECHNOLOGY

Powerful computing solutions with graphic cards, memory, and processing performance are needed to run AR/VR content seamlessly.



ENHANCED SECURITY

Devices including systems with Intel® Hardware Shield that provides hardware-based, multilayer active-monitoring protection against attacks.



VISUAL ACUITY

Full-color, high-resolution passthrough for AR/VR. Powerful graphics from NVIDIA provide superior experiences with medical imaging, clinical research, and other visual-intensive work.



IMAGE FIDELITY

Solutions that provide immersive virtual and mixed reality experiences with the highest visual quality to bring digital twins to life.

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Lenovo Solutions

ThinkPad P16 with Varjo Aero Headset

- A power-packed mobile workstation built for the ultimate professional user. The P16 is designed to deliver the highest levels of on-the-go performance powered by vPro® Enterprise with the latest Intel® Core™ i9 HX processors and NVIDIA RTX™ graphics.
- The Varjo Aero is the ideal VR headset for professional use cases in healthcare including:
 - Surgical Training
 - 3D Medical Imaging
 - Anatomical Training
 - Molecular Design & Modeling
- The Aero features a leading-edge optical design and mini-LED displays.





ThinkPad P16 with ThinkReality VRX

- The ultimate professional solution paired with an all-in-one virtual reality headset engineered for industry.
 - Lightweight design for improved comfort and extended use
 - Innovative pancake optics for enhanced visual clarity and a smaller form factor
 - Full-color high-resolution pass-through capabilities for mixed reality applications
 - Powered by vPro® Enterprise with the latest Intel® Core™ i9 HX processors.



ThinkStation P360 with Varjo XR-3

- Provides the perfect mix of value and performance in a compact desktop design.
- Powered Intel vPro® Enterprise with up to Intel® Core™ i9 processors
- Capable of running up to NVIDIA® RTX™ A5000 GPU.
- Offers versatility, flexibility, and breakthrough performance without compromising computing power
- Engineered for durability and reliability with component access to allow the system to grow along with your organization.
- Protected by ThinkShield to safeguard your device and trusted data
- The Varjo XR-3 is an immersive mixed reality headset ideal for professional use cases in healthcare including:
 - Surgical Training
 - 3D Medical Imaging
 - Anatomical Training
 - Molecular Design & Modeling

- Provides photorealistic visual fidelity across the widest field of view of any XR headset as well as the industry's highest resolution and widest-ever color gamut.
- Features depth awareness powered by LiDAR for pixel-perfect real-time occlusion and 3D world reconstruction.
- The headset has Integrated Ultraleap hand tracking and 200 Hz eye tracking for real-time feedback and post-operation analytics.



Are You Ready for the Digital Twin Transformation?

Succeeding with digital twin implementation requires the help of a partner that understands the technology and the healthcare ecosystem.

Contact your Lenovo Health Account Representative or local business partner. Visit www.lenovo.com/health and follow us on Twitter @lenovoUs.

¹ <https://www.forbes.com/sites/forbestechcouncil/2022/08/30/how-digital-twins-can-accelerate-healthcare-transformation/?sh=3cf5514432bc>

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