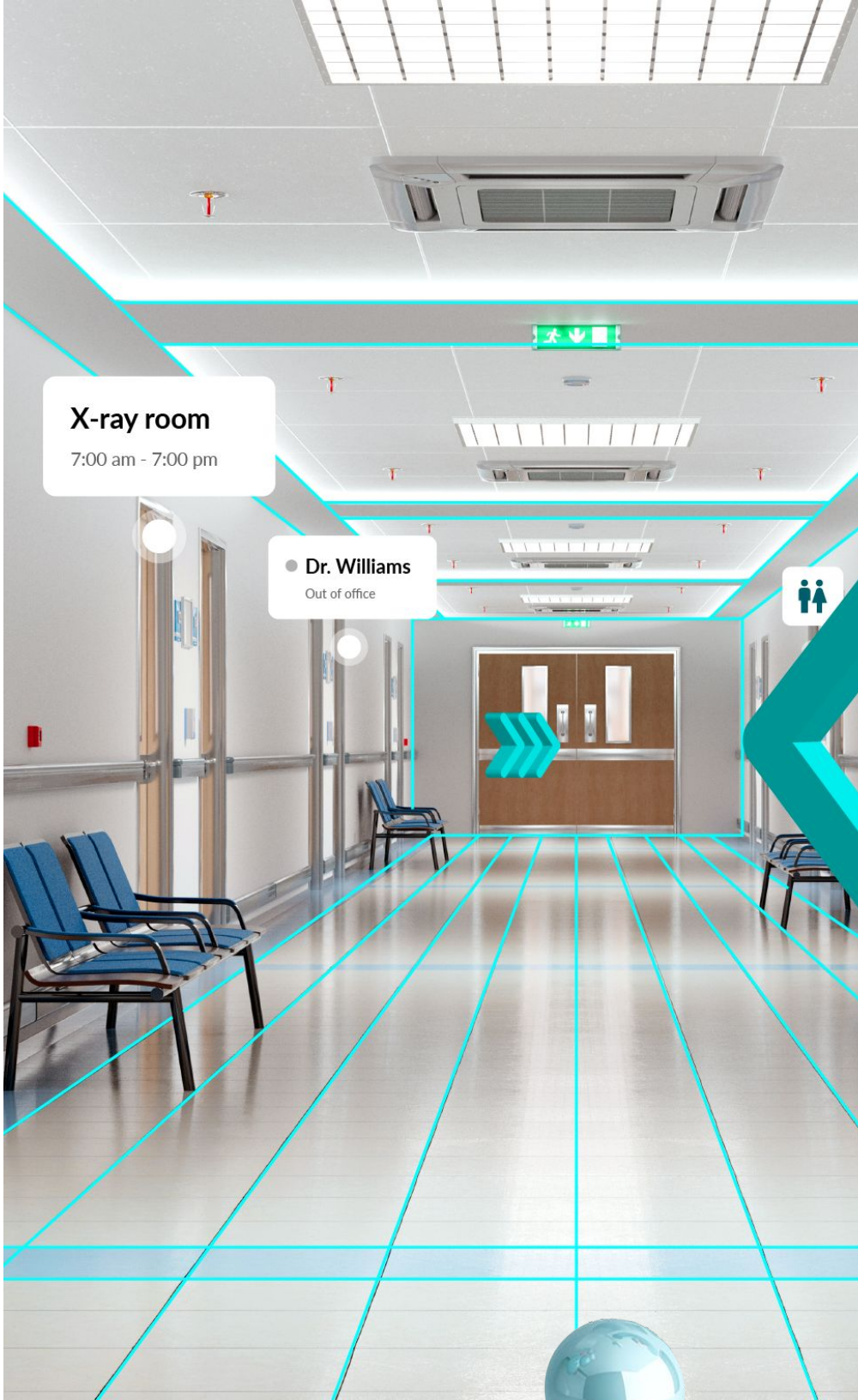
Smart Hospitals:

How Augmented Reality Is Shaping the Future of Healthcare

Resonai



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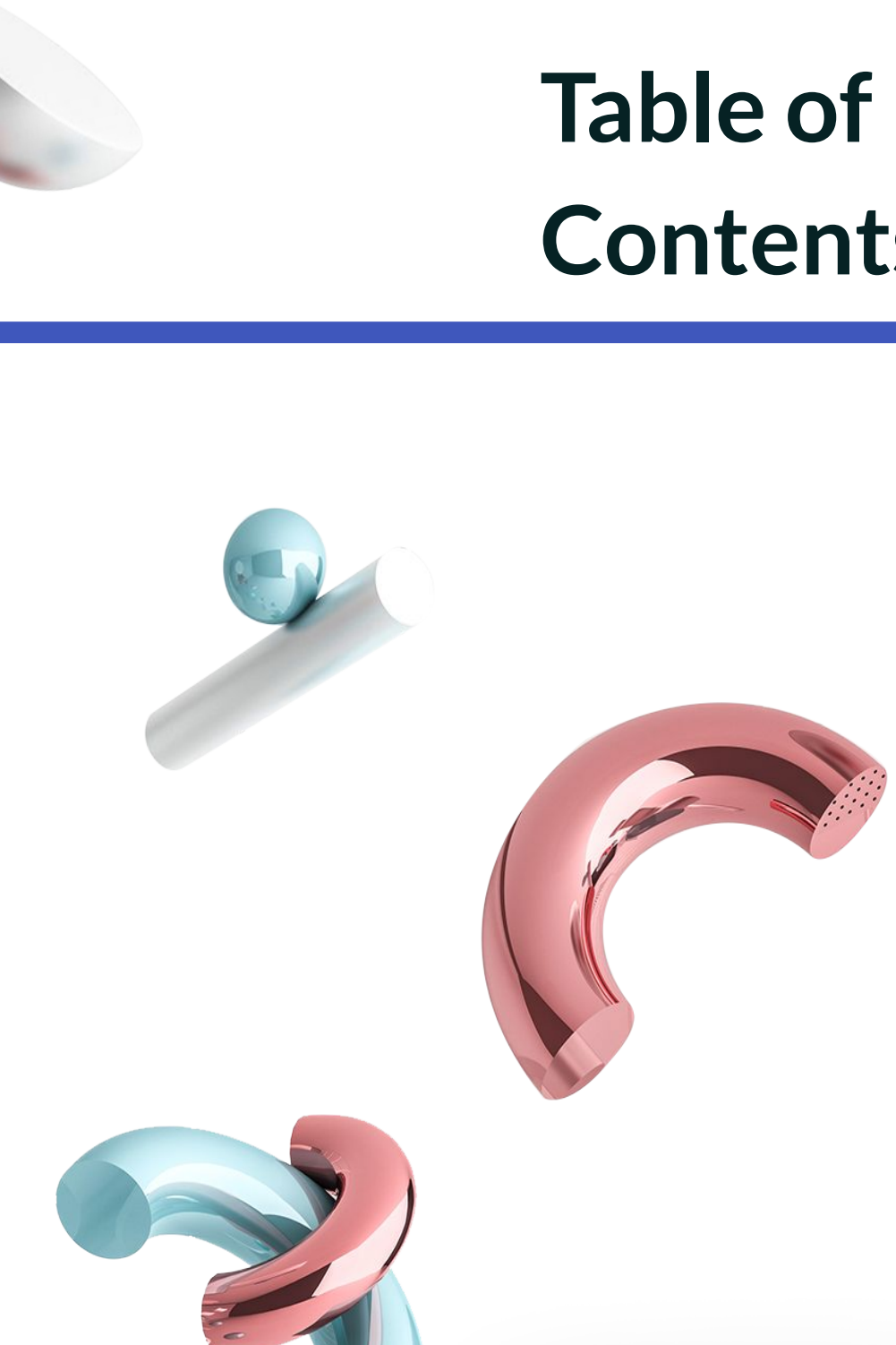
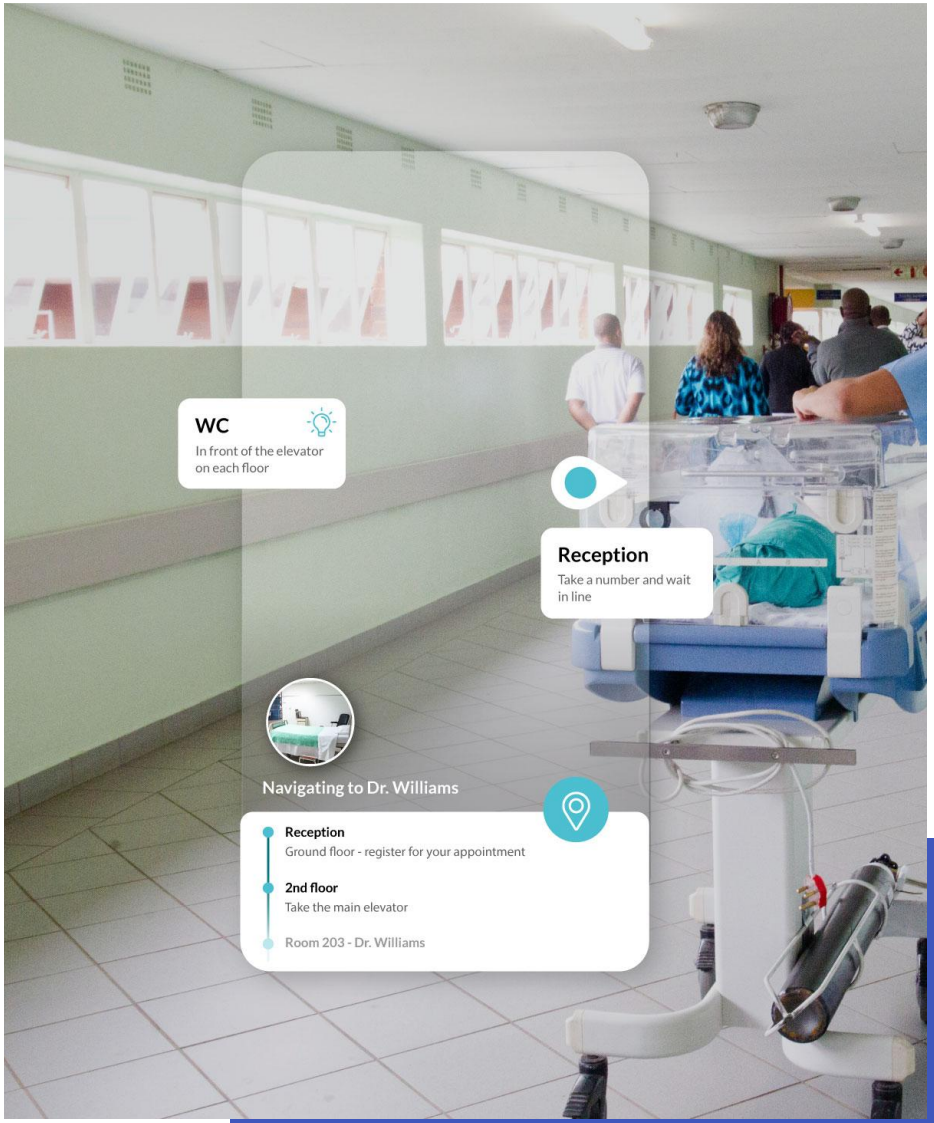


Overview

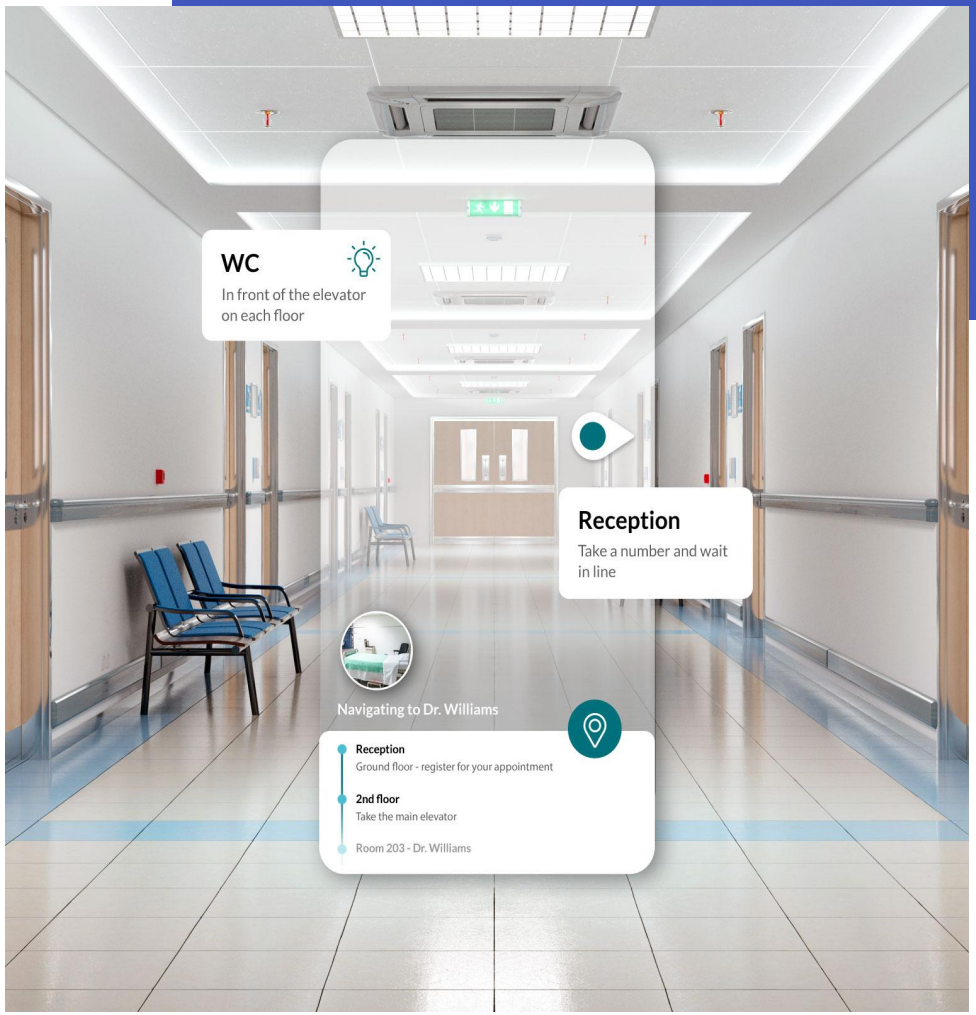
Modern healthcare institutions are experiencing rapid and fundamental changes. Doctors, technicians, and other medical practitioners see higher patient demand than ever and struggle to maintain the same level of care — all while simultaneously implementing new clinical and data storage technologies. Healthcare facilities are increasingly complex institutions, and that was before COVID-19 forced them to implement social distancing and occupancy restrictions.

It's worth noting, however, that such challenges are not strictly medical — they are inefficiencies driven by complexity. Hospitals and private practices need solutions to address organizational challenges while future-proofing operations for the 21st century. Perhaps the most compelling opportunities are smart hospital innovations powered by augmented reality technology.



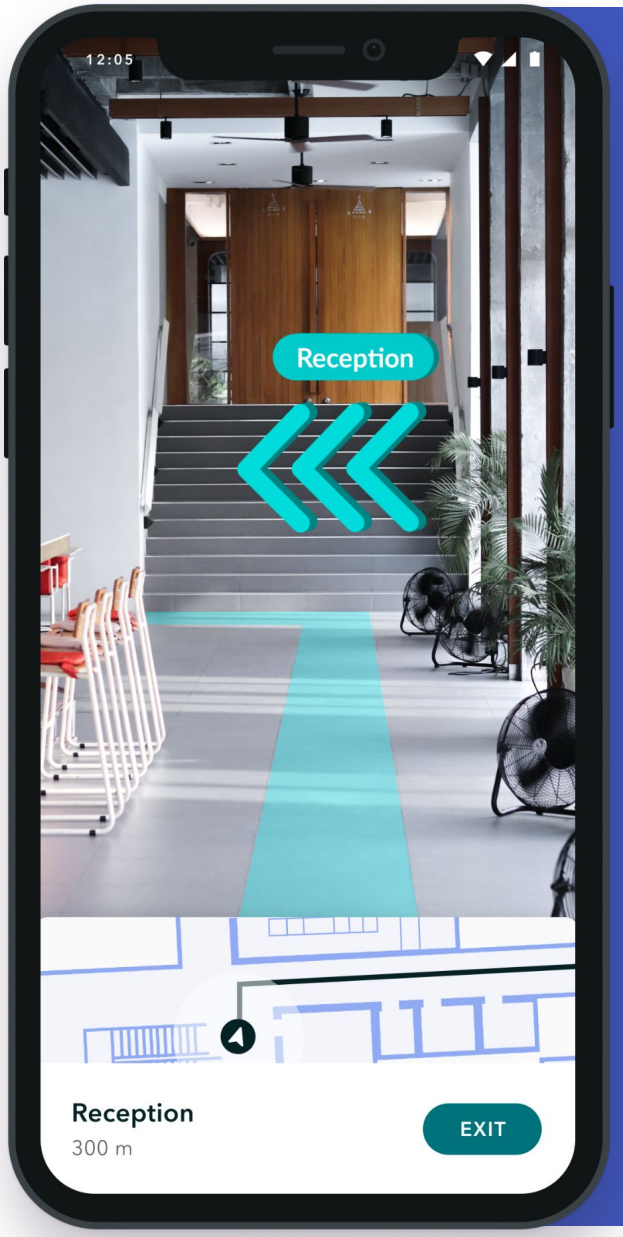
What are smart hospitals?

Smart hospitals are medical facilities that use integrated technology systems to increase efficiency and enhance internal operations. They are most common in commercial buildings and residences, but healthcare organizations are seeing the value and benefits of leveraging them as well. Facility managers can use augmented reality to automate regular building operations, manage control systems remotely, optimize energy use, and even reduce operational costs.



What is augmented reality?

Augmented reality (AR) is a technology-driven interactive experience that renders computer-generated images alongside real-world objects, most often via mobile devices. Today, AR technology applies to a wide range of practical applications in both medicine and facilities management. Perhaps the most significant examples are digital twins — virtual representations of a physical space that automatically update themselves in response to real-world stimuli. In a medical setting, a digital twin is a foundational technology that can transform traditional healthcare facilities into smart hospitals.



AR benefits for doctors, patients and healthcare administrators

Smart hospitals, digital twins, and other AR solutions create many benefits for hospital staff and visitors alike. They enable real-time reporting and analysis of workplace efficiencies, asset usage, patient statistics, and more. AR tools also assist doctors as an educational resource or visualization tool. Finally, these technologies can aid technicians in daily tasks, from inserting IVs to turnover management.

In this eBook, we'll summarize the state of AR technology in modern healthcare facilities while highlighting opportunities for doctors, nurses, technicians, and hospital administration alike to get even more value out of augmented reality.

Augmented Reality In Medical Care

While augmented reality is not expressly medical technology, it still has immense value to doctors. AR plays an increasingly significant role in medical education, creating visual models that are more detailed or interactive than traditional resources. Some companies have even developed AR tools that increase healthcare productivity while enhancing patient care.

AR-powered medical education

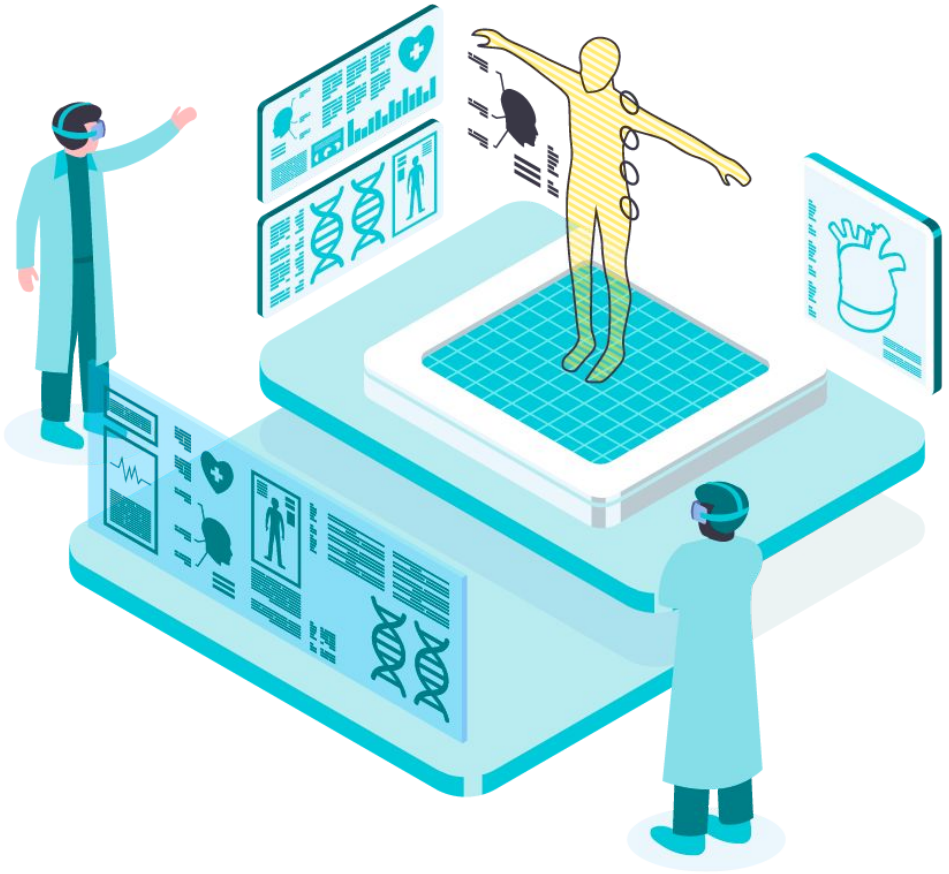
Outside of its smart building capabilities, AR has immense value as an educational tool. Many businesses use AR as a training tool for its visualization capabilities. In recent years, the medical community started exploring the potential of rendering three-dimensional images of patients for residents. The technology can even represent the effects of disease, medications, and surgeries to show doctors the full range of outcomes before making a decision.

HoloAnatomy is among the first medical AR success stories. This tool renders a complete three-dimensional view of human anatomy, complete with internal body systems. Residents can use it to study internal organs, the cardiovascular system, and more.

IV vein detection

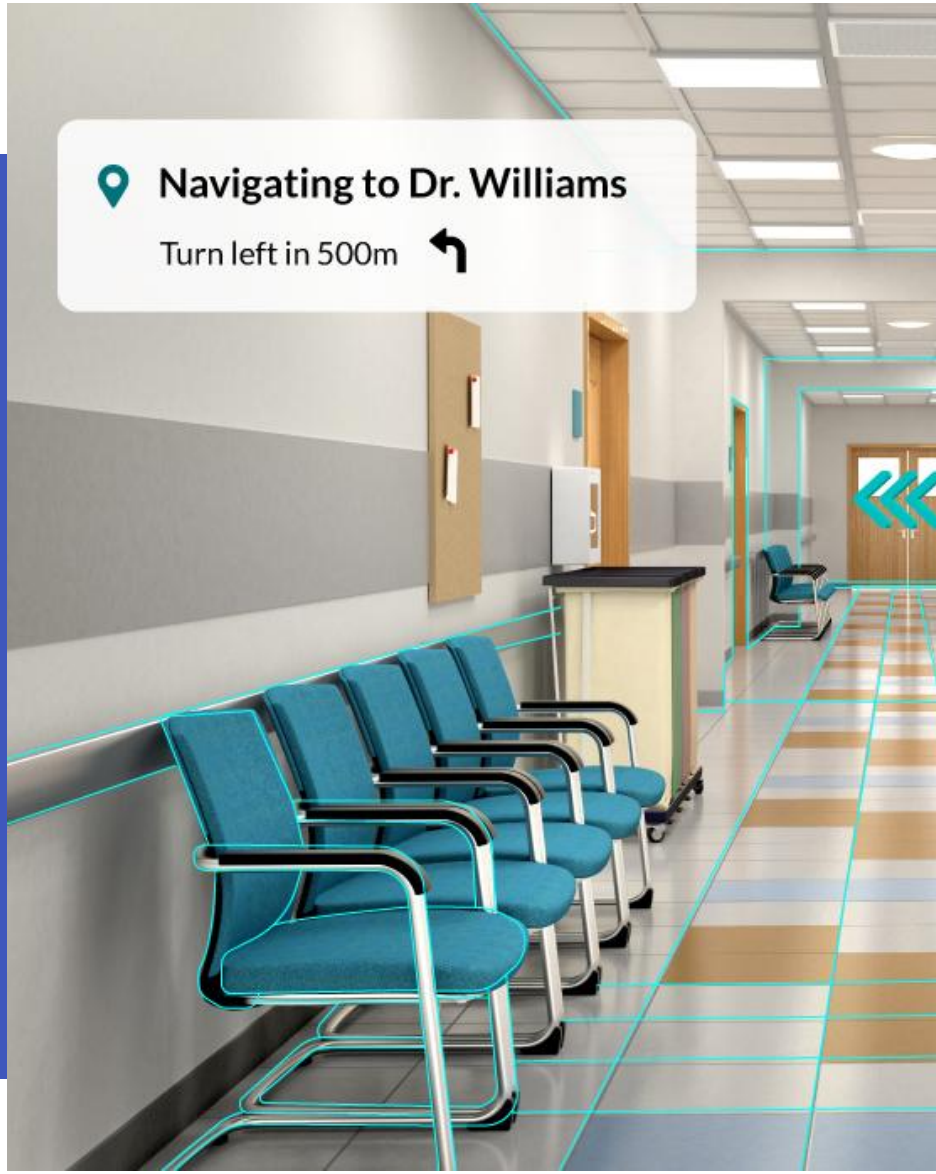
Intravenous (IV) therapy and treatments are a vital component of medical service, but even experts can fail to apply it correctly. Approximately 7 to 21% of the first attempts to find a vein fail, causing pain and discomfort for patients. Unfortunately, bringing this number down is quite difficult, even with regular training.

AR technology can help by making intravenous treatments more accurate and effective. One example is the AccuVein handheld scanner, which overlays an image onto the patient's arm showing vein locations. This step increases the likelihood of finding a vein on the first attempt by 3.5x, much to the satisfaction of patients.



Augmented Reality In Patient Support

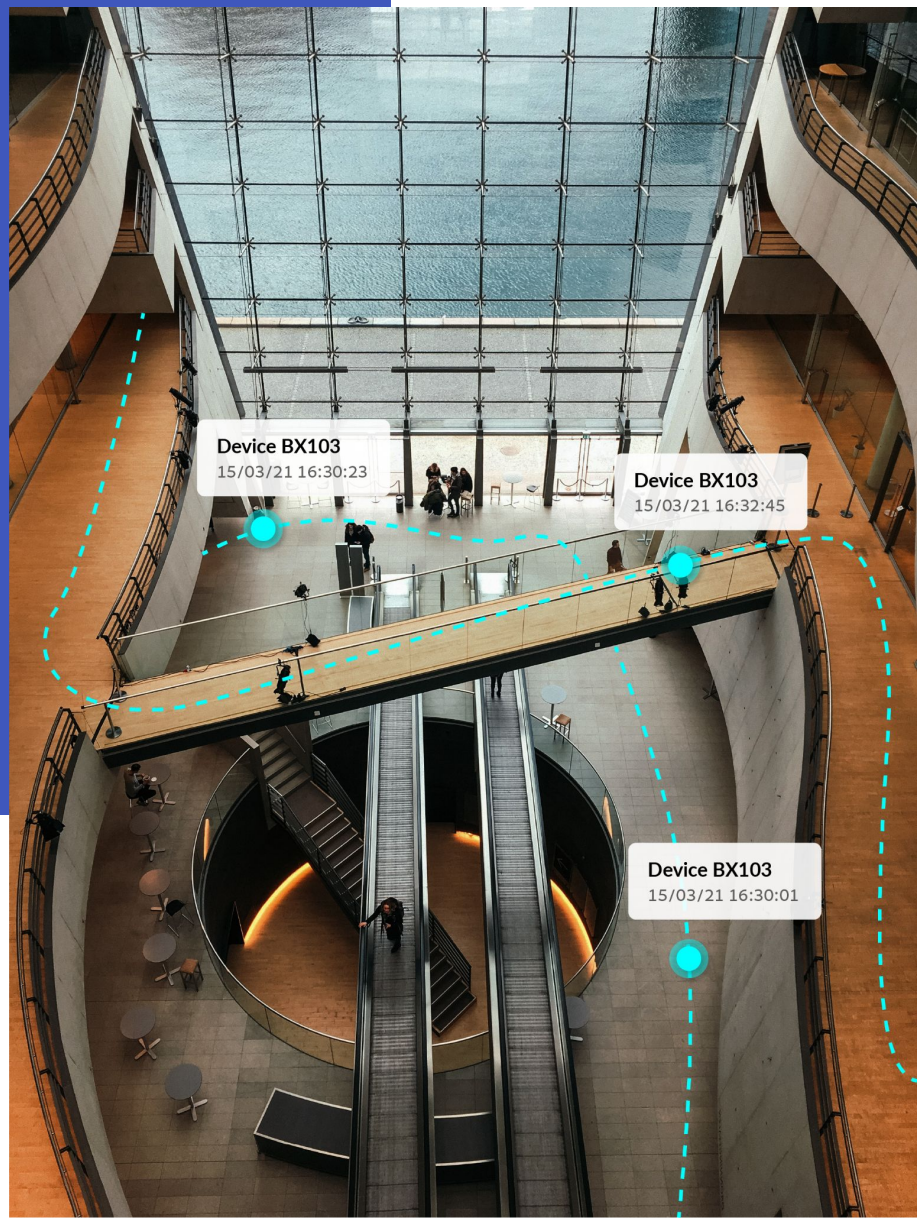
Hospitals can be a source of stress for patients and family members alike, but there are ways to alleviate their burdens. Many AR solutions in hospitals are patient-centric because they offer support and convenience to help visits go smoothly.



Indoor wayfinding

Modern hospitals are large and complex facilities, complete with multiple departments and medical specialties. Each location typically has its own layout and navigation terminology that patients and visitors may not be familiar with — to say nothing of new staff.

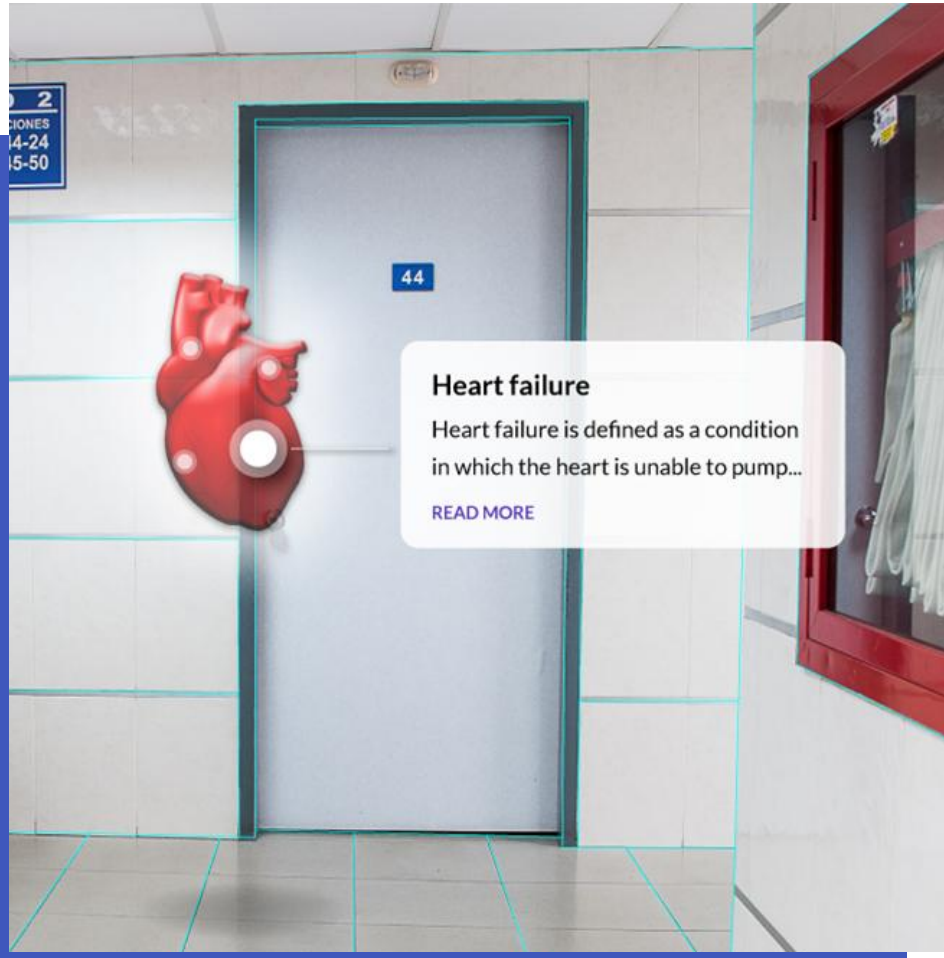
AR technology can address this issue with indoor wayfinding support — a far more precise kind of GPS designed to operate inside buildings. When accessing this navigation feature through a smartphone app, the wayfinding system overlays virtual arrows onto camera displays in real-time. This helps patients navigate through a complex space, but it can benefit other parties as well. For example, repair crews can use indoor wayfinding to locate maintenance access passages, while nurses can quickly find key equipment during an emergency.



Symptoms identification

One of the greatest challenges in healthcare occurs when a patient and doctor must come to a mutual understanding of symptoms. Perhaps a patient is uncertain about describing a condition correctly, or there may even be language barriers. In specialized medical fields like ophthalmology, communicating symptom specifics can be a time-consuming process at best.

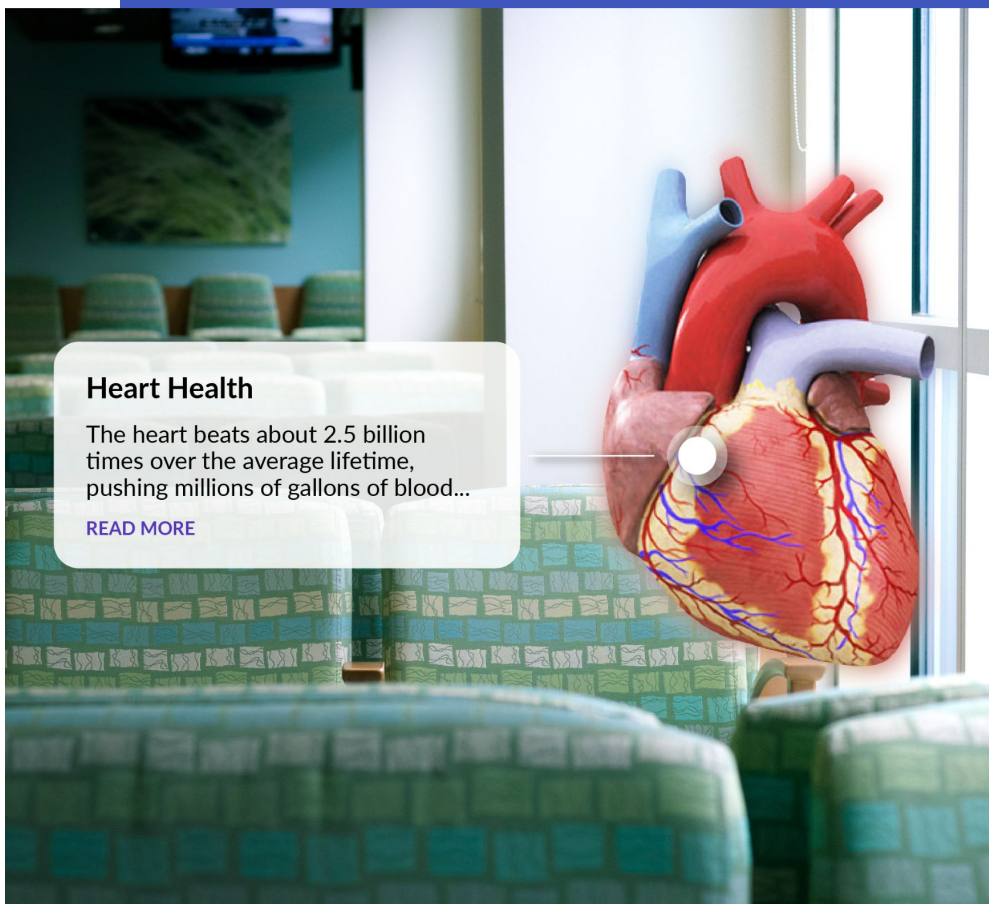
AR helps fill these gaps by creating visual representations of patients, helping them describe pain more precisely to point to specific locations. Using ophthalmology as our example, an optometrist can leverage AR models to show patients how eyes change while aging or under different medical conditions. This precise understanding lets patients better describe any symptoms while helping doctors recommend more effective treatments.



Waiting room support

For most patients and families in the hospital, waiting can be intensely stressful, especially for young children who may be coming to grips with an unfamiliar environment. While hospital staff can not remove this stress entirely, they can leverage AR tools to help patients and families pass the time.

A patient-facing app can include various beneficial features, such as mobile games, educational resources, or even local shopping options. These can be particularly useful when children need assistance focusing or staying relaxed. Implementing AR features can make these experiences more immersive while mitigating any contact risks of waiting room toys and magazines.



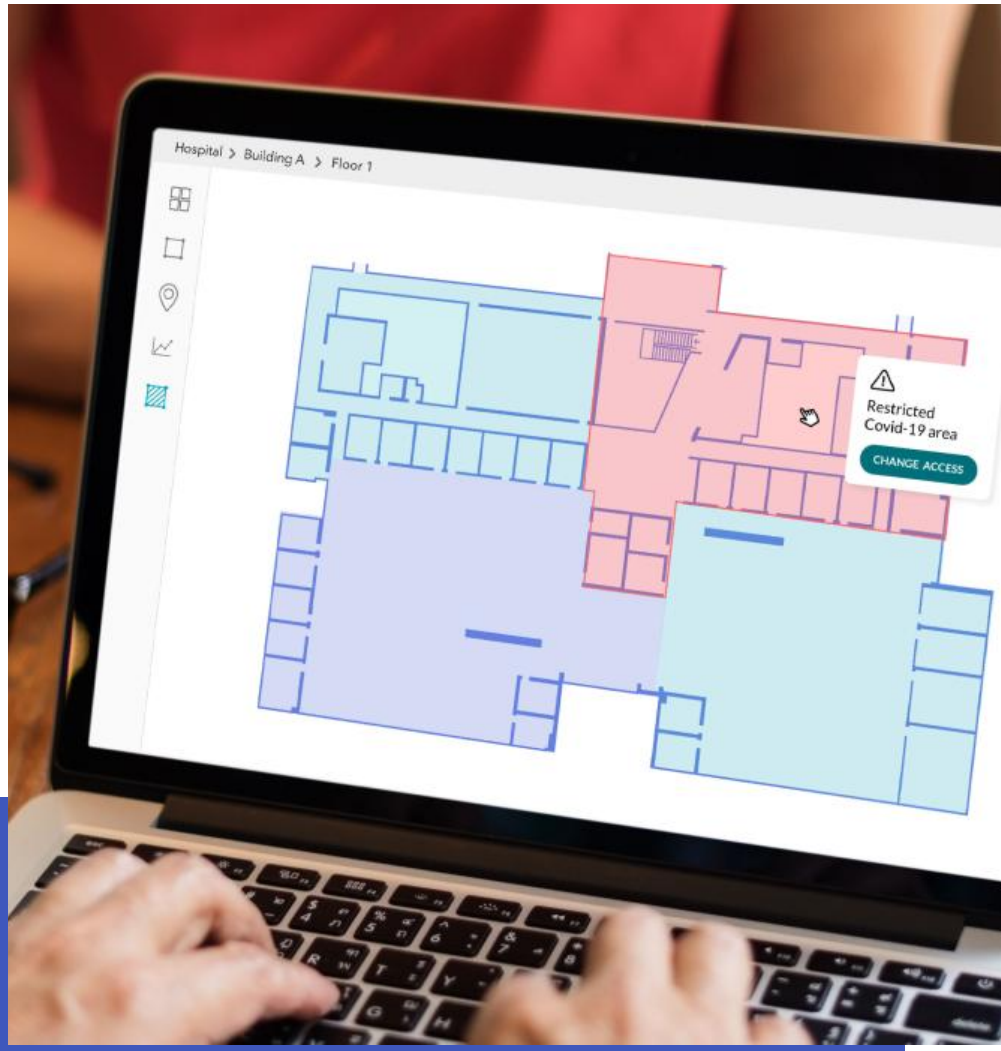
Augmented Reality In Medical Facility Management

Modern hospitals are sprawling complexes that require multiple administrative and support teams to manage effectively. For that reason, many healthcare businesses are turning to AR-powered facility management tools that enhance productivity for the entire organization.

Facility controls

Many lay people believe augmented reality is the eyes and ears of a smart building, but in practice, it also acts as the brain. Facility managers can use AR tools to unite disparate control systems into a single interface that relevant parties can manage. Such a system is particularly beneficial when managing activity across a building, generating a high-level view of patient occupancy, energy usage, and more.

From an administrative perspective, AR facility controls also make it easy to implement staff permissions for various building functions. By doing so, building managers, doctors, technicians, nurses, and other staff will all have immediate access to system features that support their objectives. AR systems can even automate some processes. For example, if a rapid response team needs to reach someone during an emergency, the controls can lock down essential elevators until it detects their ID badge.

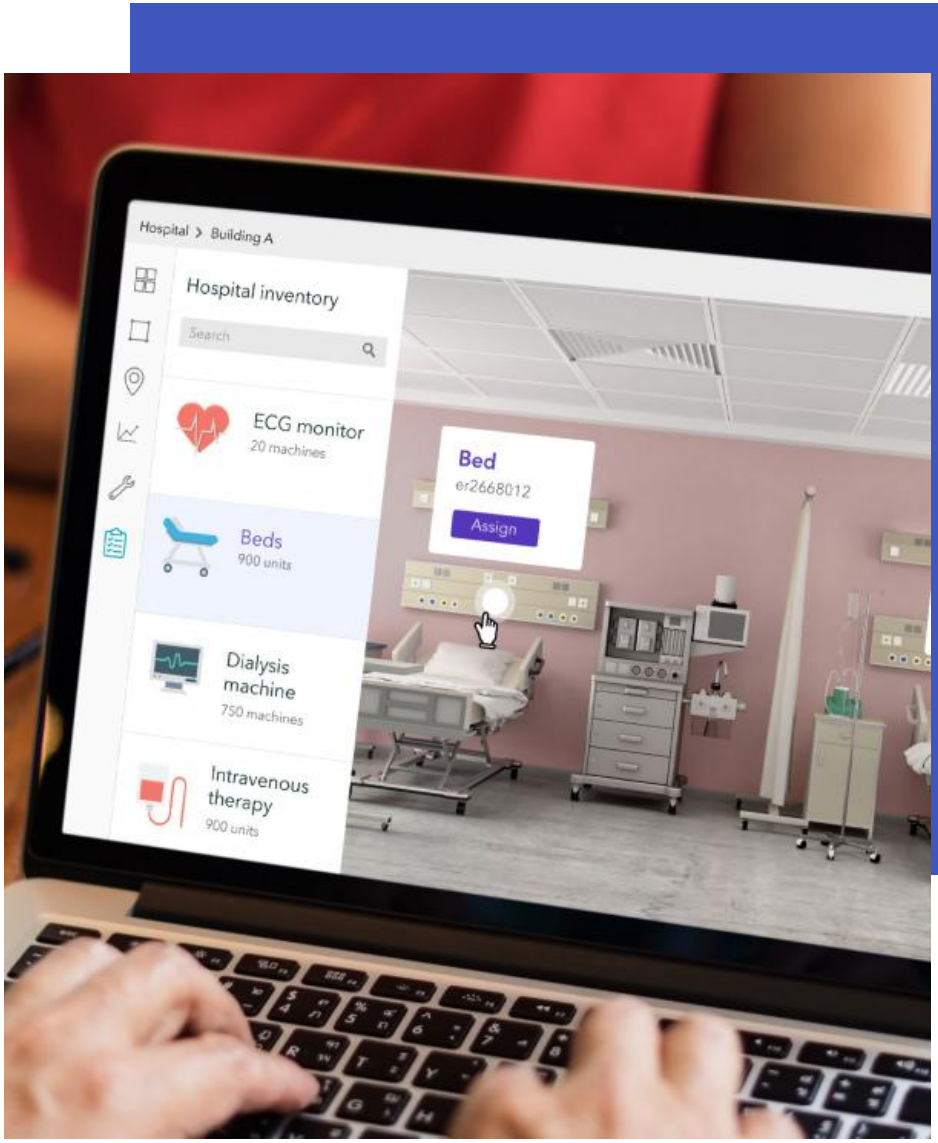


Asset tracking and maintenance

Asset management is one of the most vital responsibilities of facility managers — more so when having hospital equipment on hand is a matter of life and death. Thankfully, smart hospitals have built-in asset management capabilities via sensors located throughout the building. These systems automatically detect equipment locations, whether in storage or signed out for patient treatment.

Outside of asset tracking, smart hospitals also create opportunities for automated reporting. AR systems can maintain usage logs, tracking who signs out equipment and for how long. This information is also beneficial to technicians since it lets them know when to perform preventative maintenance, extending the lifespan of each asset.

Finally, smart hospitals can integrate with existing navigation systems to guide staff to a required asset. During an emergency, this capability might flag nearby devices such as defibrillator units, so patients quickly get the assistance they need.



What Vera Can Do For Healthcare Facilities

Hospital administrators are under constant pressure to manage assets, train staff, and reduce costs without compromising quality patient care. Thankfully, Resonai's Vera platform can help. Vera is an augmented reality platform that healthcare professionals can customize to meet their precise needs, whether building asset management tools or designing an entire smart hospital.

Enable smart hospital design

Vera scans and digitizes physical spaces to generate an intelligent 3D digital twin that is constantly updated in real-time. This virtual replica monitors and manages systems throughout the facility, providing a deeper understanding of how staff and visitors interact with each space.

Provide patient-centric smart technology

Vera's suite of mobile apps let hospitals provide an additional level of convenience and service. Patients can take advantage of contactless check-ins, dynamic indoor wayfinding, follow-up appointment scheduling, and review hospital resources.

Improve the quality of medical care

Vera automates and optimizes a variety of hospital processes to maximize task efficiency, giving doctors more valuable time to focus on patients. Technicians can leverage automated maintenance requests, equipment history logs, indoor navigation, and more to reduce support times for each patient. These processes keep response times low and decrease downtime for vital equipment.

A Vera case study

One of Resonai's clients is a company that manages equipment for senior living facilities. Before contacting Resonai, they faced a growing number of repair tickets and increased equipment downtime, which drove a lack of satisfaction and loss of revenue. To address the problem, Resonai integrated Vera into the company's facilities to automate repair ticketing, consolidate maintenance data, and provide AR navigation support for third-party technicians.

As a result, this healthcare company experienced:

30%
decrease in repair times

27%
decrease in maintenance management times

$1.4M
Savings per year

Augmented Reality Is Vital To Modern Healthcare

Modern healthcare facilities face many challenges, but they are not insurmountable. AR platforms like Vera can help any organization enhance medical education, improve patient care, optimize asset management, and much more. With these solutions, smart hospitals will be well equipped to assist all patient needs in the years ahead.

About Vera™ by Resonai

Vera is an integrated smart building platform tailored for healthcare, facilities management, and other relevant enterprises. With Vera, hospitals can future-proof their digital infrastructure to create patient-centric experiences, increase operational efficiency, and maximize cost savings.

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