



Connectivity drives smart buildings in healthcare

10 questions to learn about the benefits



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Network, communication and collaboration technologies provide the digital foundation for smart buildings, making them even more intelligent. What can this mean for the healthcare sector? The following ten questions help healthcare decision-makers explore the pivotal role of connectivity in enhancing the comfort, safety, operational efficiency and sustainability of smart buildings in health environments.

1. How are smart buildings changing the face of healthcare?

"Smart hospital buildings provide the infrastructure needed to develop the services that greatly enhance staff, patient, and visitor safety and comfort [...] Smart hospitals capture a new level of process and operational data through advanced monitoring that enables medical experts, healthcare engineers, technicians, and facilities personnel to produce significant efficiency gains."

[SCHNEIDER ELECTRIC](#)

"Healthcare leaders cut back on waste, energy, and water [...] In the next three years, healthcare leaders plan to implement further strategies, such as selecting suppliers with sustainability targets, implementing sustainable procurement, including circular equipment, and investing in green buildings and infrastructure."

[PHILIPS](#)



2. What characteristics does a smart building need for the healthcare sector?

Smart building capabilities are suitable for hospitals, clinics, senior living facilities, care centers and medical social centers. They can be deployed during new builds, expansions or redevelopment of those facilities.

A smart building for the healthcare sector is based on the same principles as other smart buildings:

- Innovative technologies enable real-time, remote control of key building systems, including heat, ventilation and cooling (HVAC), lighting, energy, water, air quality and security
- Connected sensors dynamically adjust energy consumption to enhance efficiency, sustainability, and cost-effectiveness.
- Beyond optimizing energy performance, the smart building prioritizes occupant comfort, safety and overall operational intelligence.

Faced with a growing demand for cure and care services, healthcare providers must plan for their future, combining digital transformation and sustainable development, providing automated, connected and secure care facilities.



3. Why is the network infrastructure so critical?

Today's Building Management Systems (BMS) are built with independent and sometimes siloed systems. Those systems often use different technology protocols, causing interoperability issues. Integrating Operational Technology (OT) and Information Technology (IT) systems on a single, secure and resilient IP network infrastructure is critical to enhance operational efficiency, lower costs and ensure secure management across the smart building.

The network enables this OT/IT convergence by allowing interoperability between IT systems (e.g., administrative, clinical or health research applications, networks, servers, data centers) and OT systems controlling the building's automation systems. Also, the network infrastructure is able to onboard and safeguard specific healthcare applications and medical devices as part of the whole capability.

For more information about smart buildings, read our white paper, ["The role of data networks in smart buildings"](#).

4. How does enhanced connectivity unlock benefits for healthcare facilities?

Healthcare facilities require highly efficient and safe environments to ensure optimal patient care. Enhanced connectivity provides specific benefits for smart building occupants, improving comfort, safety, responsiveness, productivity and operational efficiency:

1) Patient comfort

- Integration of Intelligent room features, such as automated lighting and temperature control, enhances patient comfort and well-being.
- Connected patient services including catering, entertainment, information or communications, are accessible through a variety of devices like fixed phones, TV, mobile apps, desktops or patient console. They enable patients to stay connected and entertained during their stay.

2) Staff and patient safety

- Notification services reinforce security measures to safeguard caregivers, administrative staff and patients against violent acts that may occur in the building.
- Tracking services locate high-risk patients in real time, such as newborn babies, elderly residents or patients with psychiatric conditions who may wander, as well as caregivers and other workers who work alone.
- In addition to the physical safety of the building occupants, advanced cybersecurity measures protect the whole infrastructure from threats that can disrupt operations and compromise the security of people and equipment.
- Patient records are also protected from data breaches, enabling healthcare facilities to comply with regulations such as the Health Insurance Portability and Accountability Act (HIPAA) in the United States and the General Data Protection Regulation (GDPR) in the European Union.

3) Facility team and security personnel responsiveness

- Secure alarm workflows integrate and monitor alarms such as fire, leak, air quality or temperature detection triggered by equipment or people, as well as specific events like patient gathering or unauthorized intrusions in protected areas.
- Real-time monitoring ensures continuous safety and functionality of critical healthcare systems such as medicine fridges.
- Intelligent video surveillance and access control provide a global view of entries and exits, using AI and analytics to identify suspicious movements. They streamline visitor management in public areas, balancing accessibility with the protection of patients, staff and visitors.
- Improved coordination and collaboration enhance emergency management and response times, including alerts and evacuations.

4) OT/IT team productivity

- Automation streamlines repetitive tasks, such as IoT onboarding, ensuring quick and secure connection of the vast amount of IoT and MIIOT devices needed in healthcare facilities, simplifying deployment and maintenance.
- Proactive monitoring helps identify and resolve network issues before they impact operations.

5) Healthcare operations efficiency

- Advanced asset tracking solutions minimize search time, prevent loss, theft, and waste and optimize medical and non-medical resource usage.
- A flexible infrastructure enables healthcare facilities to quickly scale resources up or down in response to emergencies or pandemics.
- A future-ready infrastructure allows seamless adaptation to technological advancements.

For more information about smart buildings, read our brochure, "[Creating human-centric buildings with smart capabilities](#)".

5. What innovative network technologies are behind smart buildings in healthcare?

Alcatel-Lucent Enterprise networking technologies enable innovative services for smart buildings:

- **An autonomous network** is configured and provisioned automatically to run with minimal-to-no-human intervention. This advanced level of automation through our OmniFabric technology ensures that critical services remain available, even during contingencies. OmniFabric dynamically provides alternate paths for essential traffic and encapsulates data to enhance cybersecurity, delivering a resilient, secure and self-healing network infrastructure.
- **LAN and Wi-Fi 7 WLAN** provide high performance and highly secure IoT onboarding features, enabling automated connection and profiling of wired and wireless IT/OT devices.
- Private 5G enables seamless connectivity for cutting-edge applications like robotics, remote surgery, digital twins, virtual reality (VR) and augmented reality (AR).
- **Fiber-based solutions** like HPOL (Hybrid Optical Local Area Network) enhance connectivity and scalability. This mixed technology supports enterprise-grade services such as IoT onboarding, Quality of Service (QoS) and Zero Trust Network Access (ZTNA) policies and provides the robustness of an industrial-grade access switch, all while keeping the flexibility and scalability of GPON.
- **A zero trust architecture** with dynamic network segmentation, device authentication and secure workflow ensures robust protection across IT and OT domains, safeguarding critical healthcare systems, building operations systems, IoT devices and data.
- **Workflow automation** based on IoT triggers, such sensors or cameras, can lock specific areas, adjust environmental controls or initiate group communications.
- **Video surveillance integration** such as plugins with Video Management Software (VMS) providers make video surveillance more secure and easier to manage.
- **AI-driven preventive and predictive maintenance** through an AIOps (Artificial Intelligence Operations) tool continuously monitors networks, identifies anomalies in real-time and alerts OT and IT teams, proposing actionable solutions to mitigate problems with a single click or tap.

Brochure

Healthcare connectivity drives smart buildings





6. Why are advanced communications and collaboration important for optimizing smart building operations and safety?

ALE advanced communications and collaboration solutions empower facility teams, security personnel and OT/IT teams to efficiently manage daily operations, including the execution of installation and maintenance tasks, as well as ensuring the safety and protection of patients, visitors, staff, equipment and buildings.

These teams must be continuously informed in real-time about incidents or threats, enabling them to work seamlessly together and take coordinated action:

- **Mobile phones and applications on smartphones** enable teams' mobility and agility inside and outside the buildings.
- **Rich collaboration features**—such as contact management, presence, chat, audio/video, screen and file sharing, recording—help stakeholders interact and coordinate actions, improving response times.
- **Notification services** trigger automated workflows to call the relevant individuals or groups, including contextual information such as location or incident type, allowing broadcast messages over any device for staff mobilization during incidents.
- **Emergency calls dialed to 911 or 112** are immediately located from fixed devices.
- **Isolated worker handsets** trigger alarms and share the worker's location, including features like man-down and no movement detection, a pull cord function and an emergency button.
- **Security and privacy of personal health data** are ensured by a robust regulatory and technical framework, including user authentication, encrypted data flow and compliance with global healthcare data protection requirements.



7. What are the additional benefits of deploying an asset tracking solution?

As a complement to network, communication and collaboration services, ALE's asset tracking solution delivers important advantages for healthcare buildings:

- **Staff safety:** Nurse duress buttons integrated into Bluetooth Low Energy (BLE) tags allow for real-time emergency alerts, ensuring quick response to incidents.
- **Theft prevention:** BLE tags and gateways provide real-time tracking of medical and non-medical assets, reducing the likelihood of theft and enabling immediate location identification for misplaced or stolen equipment.
- **Improved equipment utilization:** Location and usage of devices are monitored, ensuring availability where needed and reducing the need for unnecessary spares.
- **Geofencing and alerts:** Zones within the healthcare facility are defined to track and manage movement of equipment and personnel, triggering notifications when assets leave designated areas.
- **Enhanced patient care:** High-risk patients can be located in real time, preventing patient wandering.



8. How can interoperability be enhanced with the healthcare ecosystem?

Smart buildings integrate a wide range of technologies to achieve the high levels of operational efficiency and functionality that intelligent infrastructures demand.

ALE collaborates with a broad ecosystem through the ALE Developer and Solution Partners Program (DSPP) and strategic partners. Some of these companies specialize in solutions for the healthcare sector, such as notification servers, nurse call systems, bedside terminals, location solutions and more.

The DSPP offers key benefits to our customers:

- Advanced APIs and technologies for network, communications and collaboration solutions
- Trusted, certified applications
- Maintenance of joint solutions across multiple releases
- Seamless interoperability with existing systems



9. Why is ALE the best choice for your smart building needs?

ALE provides unmatched capabilities that enable the digital foundation for smart buildings in healthcare, combining innovative technologies in networks, communications and collaboration with a deep understanding of healthcare challenges:

- Healthcare-centric design: ALE solutions are tailored to the complexities of healthcare operations, ensuring safety, efficiency and optimal patient care.
- Global presence: ALE has demonstrated success in deploying scalable and reliable systems across healthcare facilities worldwide.
- Integrated solutions portfolio: Flexible on-premises, cloud and hybrid models allow healthcare organizations to adapt based on their operational and financial needs.

10. What's the bottom line?

Smart building solutions enable healthcare organizations to provide better patient care, improve staff productivity, reduce costs and achieve their sustainability goals.

ALE offers flexible, scalable solutions to help healthcare organizations expand effectively and future-proof their facilities.

Connected Healthcare

We are ALE. We help you connect your patients, staff and healthcare ecosystem, delivering technologies that work across and beyond your facilities.

For more information, visit our website:

[ALE Healthcare pages](#)

[ALE Smart Buildings pages](#)

Alcatel-Lucent Enterprise products, solutions and services are general-purpose communication, collaboration and networking technologies that have been developed to the highest quality standards. They can be used in a healthcare environment, however they have not been developed specifically as a Medical Device or Medical Device accessory within the meaning of regulation 2017/745, and therefore do not have the corresponding certifications.

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