ACL Digital
an ALTEN group company

Smart Hospitals

The future of healthcare in 2030 and beyond

WHITEPAPER

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Digital transformation and innovation technologies have affected many industries in profound ways and have also impacted the healthcare industry.

By 2030, the world's population will be more than 8.5 billion. By 2050, people above the age of 60 will have doubled compared to 2015. The need for better care is growing along with the population and the aging factors. The recent pandemic threat brought unprecedented challenges to the industry and tendered the need for innovative technologies.

One of the ways to tackle the need is by becoming and adopting 'Smart.'

What is Smart Hospital?

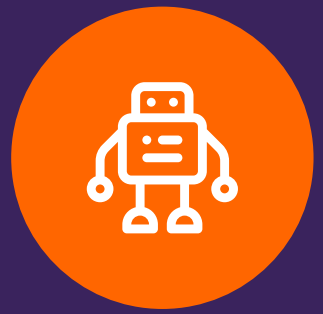
Smart hospitals are built upon innovative technologies to improve care quality and patient experiences. It includes ultramodern hospital design and the latest visual care technology, support for AI-based decision-making, IoT-connected sensors, robots to recreate how to deliver care across the digitally connected devices, and the platform. At a smart hospital, people, the environment, and systems are connected in real-time.

Information collected through these interactions will help improve basic personalized and secure patient care practices and the quality of effective operations.

Features of a Smart Hospital

Virtual Care

Cloud and Platforms



Robotics

Internet of Things (IoT)

AI and Automations

High personalized care driven by data.	Homes become the center of care with IoT and virtual medical models.	Senior-based tracking enables seamless patient flow.
Smart imaging and early diagnosis with AI.	Platforms provide on-demand access to a shared pool of data.	Effective supply chain and inventory management with IoT and blockchain.

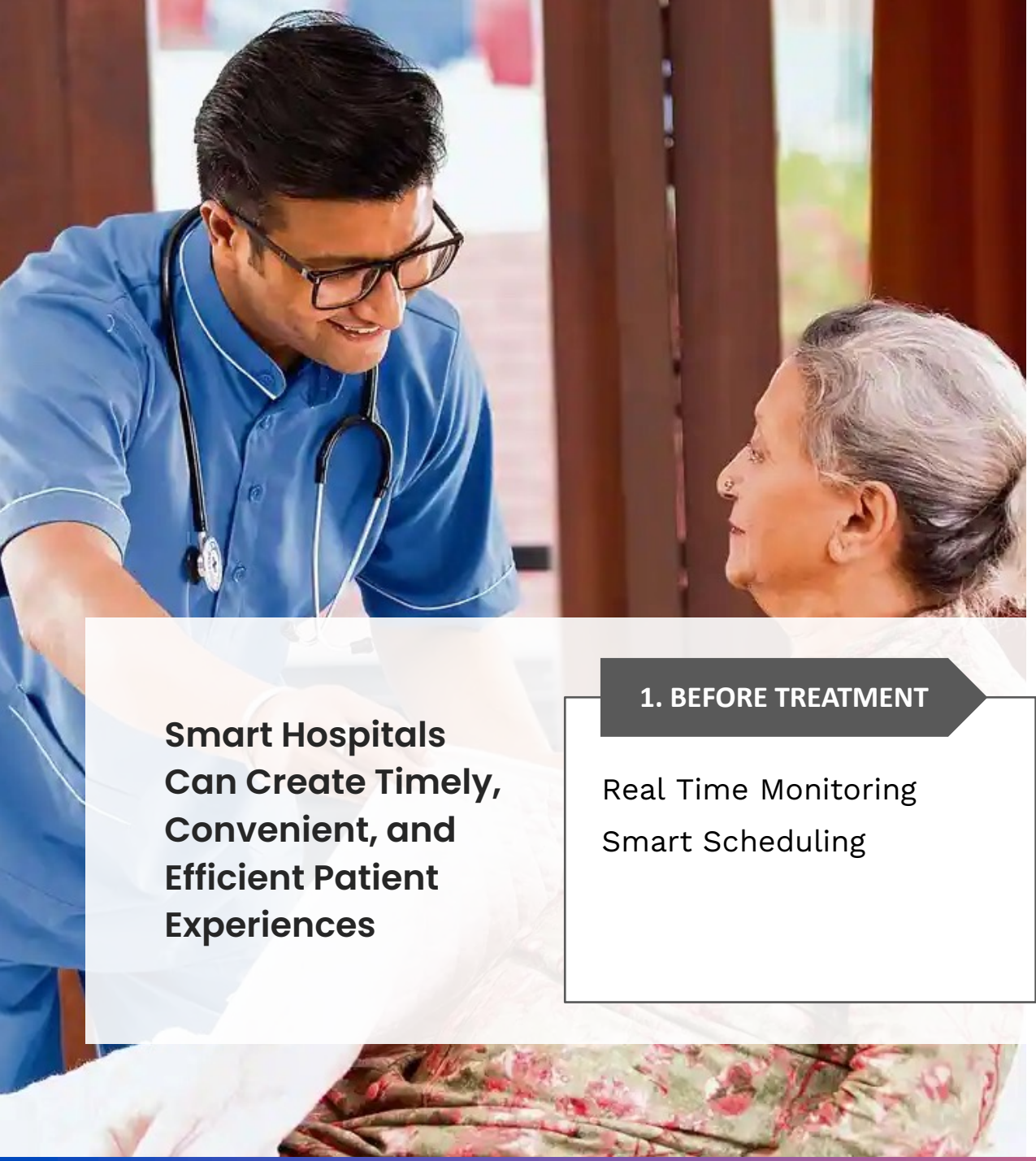
The Future of Healthcare Redefined by Smart Hospitals

Smart hospitals do not try to provide all services under one roof. Instead, they provide high-value services across a wide range of ecosystems, many of which are not traditionally associated with health care delivery.

In such an environment, preventive services and healthcare management programs are evenly spread. E.g., in clinics, gyms, and even in patient's homes. Same-day medical treatments and minor procedures are provided at the Ambulatory Surgery Centers. Diagnostic tests (imaging and laboratory services) are offered at independent centers. Hospitals are solely responsible for treating major surgeries, intensive care, acute injury management, and other severe, critical, and complex conditions.

The Future Healthcare System Will Become Decentralized and Patient-centric

1. Secured and shared personal health record
2. Effective disease prevention and primary care
3. Targeted and better quality acute care
4. Long-term chronic disease management



Patient-centric Experience

Patients are at the core of a smart hospital service design. Physicians, providers, data professionals, pharma companies, biometric systems, med-tech professionals, and others work together in this ecosystem. AI integrated with advanced technologies will supply customized and personalized care to the individual.

The evolution of smart technologies can improve the patient's experience before, during, and after a hospital stay.

Smart Hospitals Can Create Timely, Convenient, and Efficient Patient Experiences

1. BEFORE TREATMENT

Real Time Monitoring

Smart Scheduling

2. DURING TREATMENT

Smart Triage

Real Time Tracking

Self-aided Examinations

Automatic Process

3. AFTER TREATMENT

Follow-up Consultation

Cloud Based Report

1. BEFORE TREATMENT

REAL-TIME MONITORING

Wearable Devices

Much of the wearable technology is physical activity and heart rate monitors. In the future, these devices can to track temperature or blood oxygen levels. This information tells patients whether they urgently need to see a provider and can provide providers with important information that may have an impact on patient treatment.

Remote Patient Monitoring

It is a digital solution based on multiple technologies aiming to collect medical and other types of health data separately, remotely, and securely so that better decision-making is possible for the patient to recover and avoid suffering.

SMART SCHEDULING

AI-based System

It recommends doctors and makes bookings after online communication.

Cloud-based applications and storage can save time and money for companies looking to become digitally efficient quickly.

2. DURING TREATMENT

SMART TRIAGE

Biometrics

Latest biometric authentication technologies like the fingerprint scanner, palm vein scanner, facial recognition tech, and iris scanner will confirm identity and smart triage based on retrieved health information and AI analysis.

REAL-TIME TRACKING

Wearable Band

Effective smart tracking is an excellent representation of how Bluetooth and the internet of things can combine to improve healthcare and patient security.

SELF-AIDED EXAMINATIONS

E-Diagnosis Center / Device

IT provides simple test to the patients such as image scan and collecting samples.

AUTOMATIC PROCESS

Mobile Device / App

IT provides patient transparency on scheduling, diagnosis report, drug report and payment information.

3. AFTER TREATMENT

FOLLOW-UP CONSULTATION

Mobile App

These apps alert the patient to take medicine on time, notify recovery, and provide payment information.

CLOUD-BASED REPORT

Cloud Platform

It provides all the steps the patient has undergone in the treatment, drug info, lab results, and consultation info to generate an accurate medical report.

These reports are incorporated into patient health records, accessible through mobile devices/apps.

Principles of Patient-Centric Design

A smart hospital will follow the below foundational design principles for being patient-centric

1

Hyper-connected

Health information structure is built on data fluidity between physical and virtual environments and systems. It includes connecting with other care settings and organizations, such as primary care professionals and community care workers.

2

Human-centered

Patient, family, and employee-centric, where human-centered service design places people at the problem-solving center by developing a deeper understanding of their needs, motivations, and challenges.

Intelligent

With access to insights that support fast and correct real-time clinical and operational decisions through connected platforms and data.

3

High reliability

Combines high reliability process design with intelligent automation, sensors, and predictive analysis to prevent, assess and reduce the risk of vulnerability, medical errors, and poor care.

4

Sustainable

Models of care that are clinically, financially, economically, and environmentally sustainable for hospitals, their workforce, patients, and communities.

5

Key Assets of Smart Hospitals

1 Technology that allows fast, flexible, and reliable care

Smart hospitals improve technology not only to improve the delivery of care within the hospital but also to connect the hospital to a comprehensive health care delivery system and to drive patient focus across all care areas. Algorithms are embedded in the care and automation procedures, maximizing resources, predicting conditions, and supporting clinical decisions to supply the best individual care.

2 Capability to real time decision-making

With real-time data, patients can be treated in the right place at the right time. It allows for faster, more evidence-based decision-making. With shared technical and semantic specifications and data exchange standards and information, forums integrate data from multiple sources (including ecosystem partners) with EHRs and other IT systems, making data valuable.

Only 20% of related information and health is available in the health system today. Combining health system information with new sources (social, ethical, financial, and environmental) will improve the pursuit of active and participatory care.

3 Partnerships with ecosystem players

Smart health systems actively seek partnerships (especially with technology companies) that combine their healthcare ability with high-tech skills, connected technologies, and deep consumer insights. In doing so, they influence technologies to develop innovations and supply the change needed to thrive in new partnerships, alliances, positions, and consumer orientation environments.

4 Smart infrastructure

Smart infrastructure technology for hospitals utilizes data from IT and OT systems to build smart ecosystems that support the entire patient recovery process and help the center’s management to have improved management, giving rise to the future hospitals.

Why Smart Hospitals?

The epidemic has highlighted and intensified the struggles facing the health care sector. From overworked doctors to unsatisfied patients to informal settings where staff waste hours looking for critical things. Another contributing factor is the emergence of “informed patients” who refuse to receive silent treatment. They ask for more information and want a voice in their treatment choices.

Many medical institutions are already turning to health technology companies for better hospital repairs, which will help them cope with the epidemic and build their services for the patient.

Challenges

When considering their long-term innovation potential, integrated technology and smart hospitals have just skimmed the surface. There are significant challenges that hospitals must overcome to implement and get the most out of their IoT technologies. Some of the substantial challenges are the ability to set up a continuous process for patient monitoring, interoperability of sensors, data accuracy due to human-prone errors while feeding the machine learning program, and finally, the security and privacy of healthcare data. Even though these are significant concerns, they can be minimized or eliminated over time as the technologies evolve.

Conclusion

The smart hospitals of the future will be very different from the hospitals of today and the past. Smart hospitals will operate in a decentralized care delivery environment and no longer act as the primary (or, in some countries, sole) providers of all intervention healthcare. Instead, smart hospitals will focus on the core set of in-house services and connect with a broader ecosystem to deliver other necessary care in an agile and efficient manner. In smart hospitals, digital clinical staff will be able to provide better outcomes and more integrated patient experiences while continuously innovating in the delivery of care.

The development of smart hospitals is more than just a technology project. Commitment to smart health needs meticulous planning, knowledge to overcome challenges, strong change management, and executive leadership skills. Also, it involves all stakeholders - management, doctors, nurses, employees, and ecosystem partners.

If you are willing to build a smart hospital, it is a promising idea to start by searching for a trusted digital innovator to build your intelligent hospital system. Once everything is in place, your hospital will be ready to surpass the expectations of patients and staff.

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Digital Product Engineering

ACL Digital, an ALTEN Group Company, is a digital product innovation and engineering leader. We help our clients design and build innovative products (AI, Cloud, and Mobile ready), content and commerce-driven platforms, and connected, converged digital experiences for the modern world through a design-led Digital Transformation framework. By integrating our strategic design, engineering, and industry capabilities, we help our clients decode the digital world and accelerate their growth journey.

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