

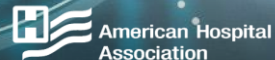


Smart Hospital

Helping you achieve efficiency and optimal performance

December 7, 2022

innovation  you





Today's speakers



Edgar van Zoelen

Global Practice Leader

Performance Analytics and Digital Transformation

Philips



Angus Cameron

Enterprise Care Collaboration Lead

Philips

Agenda

1. Smart Digital Healthcare - needs and trends

2. Smart Digital Healthcare - investment and adoption

3. Smart Hospital development and Digital Transformation

4. Elements and examples of a Smart Hospital

5. Summary and Q&A

Our understanding of your issues and challenges

What our customers are asking us

How can I enhance the performance and growth of my hospital?



How can I leverage data and technology across the health continuum?



How can I manage the increasing disease burden and health inequity?



How can I implement virtual models of care to reduce time in hospital?



What resources allow me to manage care more efficiently and effectively, in order to improve length of stay and discharge, or move patients to another care setting?



How can I enhance placement in subacute or access to subacute beds?



How can I reduce the cost basis of my hospitals?



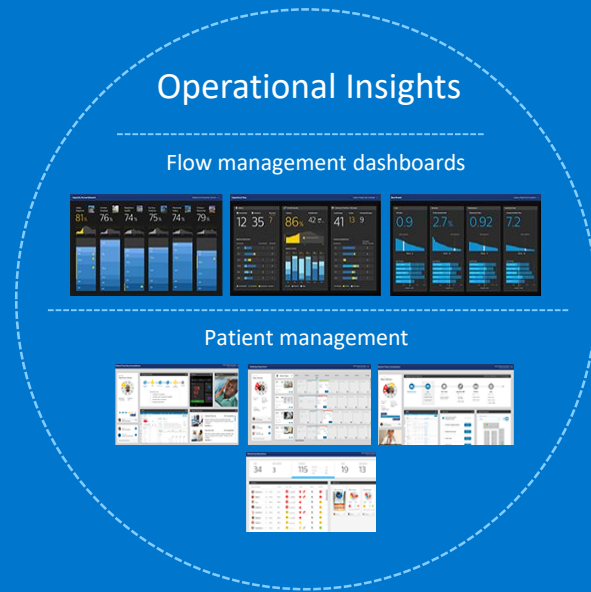
The future of healthcare is an intelligent system of care

Care across settings with proliferation of access points



Facilitating the orchestration of care

Achieving tailored benefits via actionable intelligence and process transformation



People

Technology

System / Processes



Transformation and Smart Digital Healthcare North America and Global Statistics

Smart Hospital and Healthcare 4.0

A long-overdue digital transformation in healthcare

- Technology is affecting industries today in profound ways
- Clinical and operational data however for the most part is still siloed, longitudinal care data are still not part of routine care in many countries.
- The age of digital transformation and Healthcare 4.0 is now paving the way for exciting new opportunities to change the way people develop and receive digital health and care services.

We are at the dawn of a foundational change into the new era of smart and connected health care...



Moving digital healthcare forward

22.97%

The CAGR (compound annual growth rate) over 2022-2030 for Smart Hospitals in NAM¹



\$147Bn

North American market size by 2030

63%

Percentage of hospital leaders in North America say that they are increasing their spending on digitalization²



>\$30Bn

Worth of the global Smart Hospital market in 2021³



\$21Bn

North American market size by 2023

\$7.6Bn

Global market value of remote or virtual care⁴



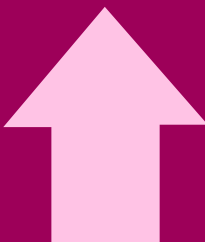
60%

Of patients believe virtual care is more convenient than in-person care



\$171Bn

The global artificial intelligence market is expected to reach \$171.02 billion in 2025 at a CAGR of 35%⁵



76%

Percentage of US healthcare professionals who currently use digital health technology or mobile health apps⁶

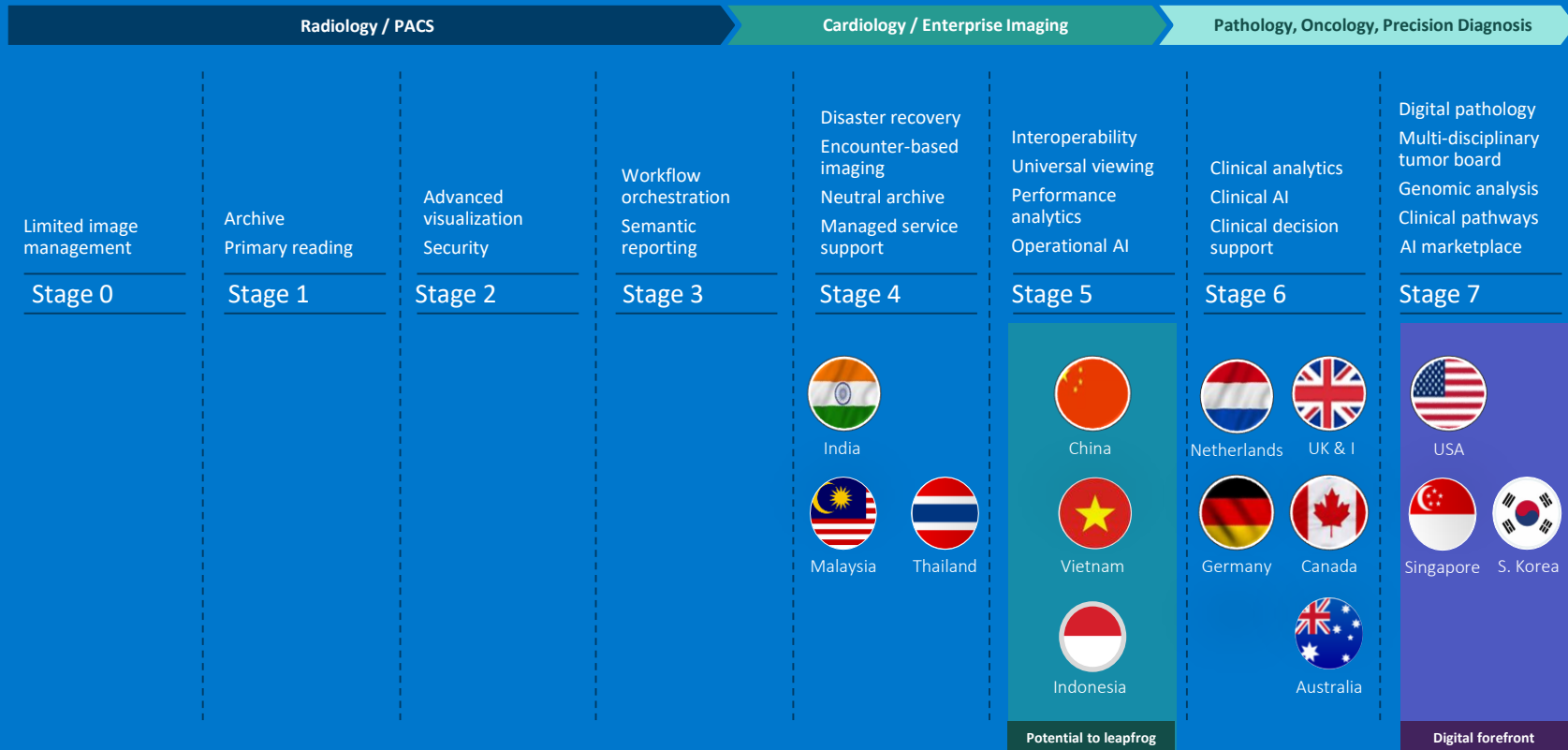


Sources : ¹Digital Journal
²Chief Healthcare Executive
³GlobeNewswire
⁴McKinsey
⁵GlobeNewswire
⁶American Hospital Association

The current landscape of digital adoption globally - 2022



The current landscape of digital adoption globally - 2025



- ✓ Countries are advancing at speed
- ✓ However, not all hospital systems will be able to make the change
- ✓ You don't want to be uncompetitive and stay behind
- ➔ This is how you approach the transformation...



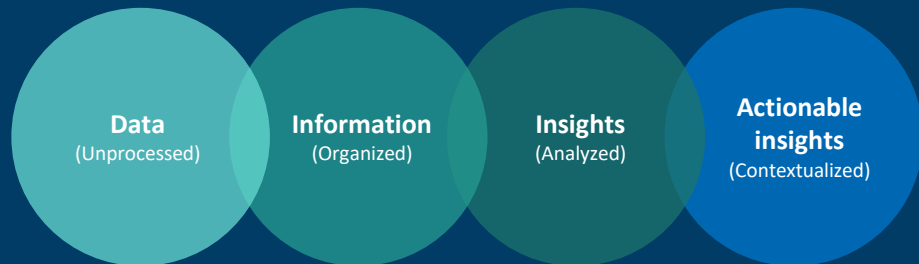
Smart Hospital development and Digital Transformation

What is our definition of a smart hospital?

Hospital that **digitizes** and **interconnects** assets and all forms of data to **optimize** and redesign processes in order to create value, achieve **better patient care, experience and operational efficiency.**



The evolution of data towards that of a smart hospital



Empowering people to make better informed and faster decisions to improve an organization

There is no one-size-fits-all solution for a Smart Hospital

Every organization has unique goals and operating principles. Stemming from these differences, each hospital would also have different value drivers, areas for advancement and different visions for their Smart Hospital. As they have different focus areas, distinct solutions would need to be prioritized and priorities may create unique timelines or roadmaps. Hence, no two Smart Hospitals builds, or Digital Transformation journeys are the same, as each is customized to suit individual needs and aims.

Hospital J

Smart Hospital References

SMART HOSPITAL PRINCIPLES

Operational efficiency

Principles

- Optimizing Patient Flow and Throughput
- Efficiency, Productivity and Infection Control
- Efficient Staff Flow and reduced inventory
- Reduced mortality and length of stay
- Integrated Clinical Data, Billing and Scheduling

Smart Initiatives

- Clinical Command Centre
- Automated Scheduling and Waste Management
- Equipment and Staff tracking
- AI/ML for remote monitoring
- Integrated Clinical Data, Billing and Scheduling
- Comprehensive EHR

Clinical excellence

Principles

- Efficient Clinical Decision-Making and Clinical Outcomes
- Translational Medicine Capabilities

Smart Initiatives

- Virtual-operative OR
- Leading Imaging and Biologics Capabilities
- Large Research and Teaching Budget

VALUE DRIVERS

Cost of care

Clinical outcomes

Patient experience

Staff satisfaction

ADVANCEMENT

Operational advancement

Clinical advancement

Research advancement

Experience advancement

Digital readiness

Infrastructure readiness

Experience centrality

Principles

- Patient Experience

Smart Initiatives

- Transformational Patient-centric Facilities (1.6BnM USD)
- Online Appointment

Example 01: Research-oriented Smart Hospital

Hospital B

Smart Hospital References

SMART HOSPITAL PRINCIPLES

Operational efficiency

Principles

- Reducing Medication Errors and Inefficiency
- Efficiency and Reducing Inventory and Expensing Time

Smart Initiatives

- Primary Robot
- Automated Drug Management System

Clinical excellence

Principles

- Efficient Clinical Decision-Making and Clinical Outcomes
- Efficiency and Reducing Length of Stay
- Improved Diagnosis

Smart Initiatives

- Advanced Imaging Technology
- Image-Guided Radiation Therapy
- Robotics, Surgery
- RO CAD Image Checker

VALUE DRIVERS

Cost of care

Clinical outcomes

Patient experience

Staff satisfaction

ADVANCEMENT

Operational advancement

Clinical advancement

Research advancement

Experience advancement

Digital readiness

Infrastructure readiness

Experience centrality

Principles

- Conducive and Inspiring Environment
- Improved patient access to information
- Clarity of Patient Journey

Smart Initiatives

- 5.5m USD Equipment
- Concierge and Nurse Navigator Resources

Example 02: Experience-oriented Smart Hospital

Hospital U

Smart Hospital References

SMART HOSPITAL PRINCIPLES

Operational efficiency

Principles

- Integrated data and information
- Time-saving and productivity
- Reduced mortality and length of stay
- Reducing Readmissions

Smart Initiatives

- Fully Digital OR - Real-time Integrates Inpatient and inpatient data
- Smart Rooms with wireless capture of vital signs
- AI/ML for remote monitoring
- Take Health Clinical disease management programme

Clinical excellence

Principles

- Efficient Clinical Decision-Making and Clinical Outcomes
- Teaching and Clinical Education
- Reduce Length of Stay
- Outward monitoring

Smart Initiatives

- Advanced Imaging Technology
- Advanced Robotically-assisted surgery
- Virtual Robotic Surgery
- Biomarkers
- Remote House-Testing for Cancer Genetics

VALUE DRIVERS

Cost of care

Clinical outcomes

Patient experience

Staff satisfaction

ADVANCEMENT

Operational advancement

Clinical advancement

Research advancement

Experience advancement

Digital readiness

Infrastructure readiness

Experience centrality

Principles

- Conducive and Inspiring Environment
- Future-proof Facilities Design
- Improved patient access to information
- Enhanced Wayfinding and general information

Smart Initiatives

- New Hospital with patient-centric design
- AI/ML Technology
- Patent-Powered MR0000000000
- Robot Concierge "LARA"

Example 03: Well-rounded Smart Hospital

We look at Smart Hospitals more holistically and across four domains

The Healthcare Information and Management Systems Society has a focus on clinical information, digitalisation and underlying platforms we incorporate a broader lens to include operations and experience and capability

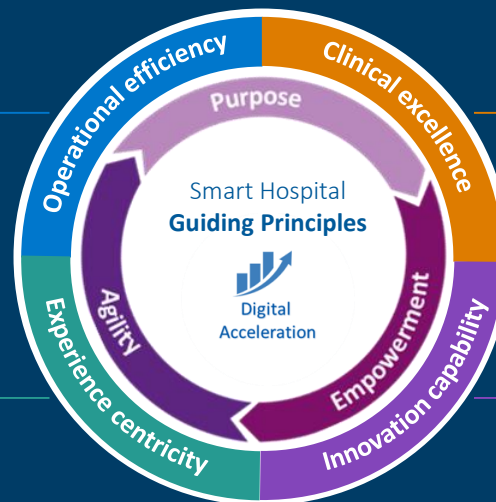
These are the fundamental dimensions of Smart Hospital to achieve excellence in healthcare delivery in an integrated fashion across three domains or principles.

Operational efficiency

To leverage smart insights from a digitally connected ecosystem to improve internal logistics and maximize utilization rates of resources as well as control over people flow

Experience Centricity

To create the healing environment to ensure faster recovery while also looking at non-clinical touchpoints to alleviate patient fears, support and inconvenience associated with hospitals



Clinical Excellence

To make extensive use of innovative technology and its insights to drive excellence in clinical outcomes and efficiency in the care system

Innovation capability

Smart hospitals develop and embed new organizational capabilities to sustain digital innovation and create a culture of continuous improvement

Within this broader Smart Hospital perspective, we provide tangible direction and potential levers and enablers within each domain

These initiatives are then supported by either Philips or other organisations solutions

	← Principles	Levers	Core enablers	→
Operational Efficiency	HIS infrastructure	Data Platforms and Integration	Performance analytics	Security & Compliance
	Information Logistics	Inventory Control	Asset tracking	Maintenance operations
	People Flow (Patient & Staff)	Patient flow tracking	Hospital staff flow tracking	Flow management
Clinical Excellence	Digital Care Management	Digitally-enabled workflow	Data-driven clinical decision support	Digitally coordinate care
	Inter-professional collaboration	Inter-professional decision making	Inter-professional care practice	Inter-professional teamwork culture
	Leading Practice	Population Health	Tech-enabled patient care	Research & Innovation culture
Experience Centricity	Environment	People-centric care environments	Staff workplace safety	Patient support & safety
	Patient services	Shared care decision-making	Patient education and information access	Patient self-management
	Admin services & Hospitality	Patient concierge services	Financial management	Supportive services
Innovation Capability	Purpose	Shared strategic understanding	Common digital vision	Collective capability & training
	Empowerment	Cultural maturity	Cross functional & talented teams	Digitally focused funding
	Agility	Governance and oversight	Adaptive digital platforms	Outcomes focused

We believe you need a structured and stepwise approach to realizing the right Smart Hospital and digital transformation roadmap for your organization

Starting with a shared understanding of where you are, setting the vision and then developing the culture and capability to continually improve and innovate are key foundational elements of the journey

Current assessment and shaping the vision



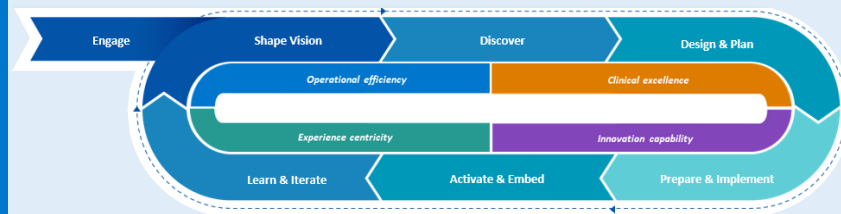
Digital Maturity Assessment

Building consensus around service line & patient focused digital requirements



Co-creation

A purposefully designed multi-year process to build capability to innovate and drive improved performance



Roadmaps and Performance Improvement loops



Elements and examples of a Smart Hospital



An example of some of Philips digital healthcare solutions

We can partner and create a scalable healthcare ecosystem

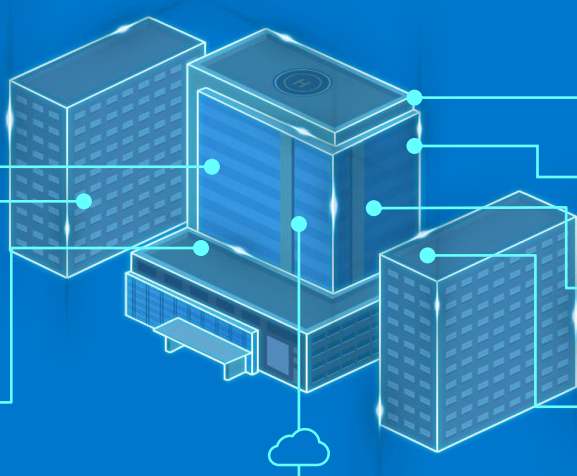
Advanced Diagnostics & Treatment
New Features, machine learning and AI for Diagnostic Imaging & Int. Cardiology Systems



Staff & Patient Experience
Optimized Digital patient Journeys, patient navigator and Ambient Experiences



Smart seamless Trauma & Emergency Care
Connected Ambulance monitoring and virtual care with mobile Ultrasound & Patient Monitoring within the ED



AI Research
Medical Image AI Research center (Radiology, N.M, Path.) based on latest technological developments



Digital Pathology
Digital & Computational Pathology



Virtual Home Care Services
World leading Remote Cardiac and other disease cohort patient monitoring solutions



Tele-ICU across Network
World leading Tele-ICU across Network

Scalable Connectivity: Operations Centre & Virtual Connected Care



Enterprise Imaging
Foster collaboration and optimize workflows, shortening the path to precise decisions.



Operational Informatics
Integrated, scalable portfolio of innovative technology, analytics and professional services to empower hospital departments to improve their efficiency & performance



Seamless patient care management
Leading global integrated monitoring solution
eICU, ICCA, Guardian, BioTel, Vital Health

Long-term Strategic Partnership supported by

Governance Structure

Customer Service

Project Management

Philips Capital

Continuous Improvement



YongIn Severance Hospital (New YongIn) – a multi year Strategic Partnership

Seoul – South Korea

A four-hospital private university hospital network established in 1885 with over 3,700 beds, 1m Inpatients and 3m+ Outpatients. This opportunity focused on the planning and commissioning of a new 750 bed “Smart” digital hospital.

“Philips is the best partner to achieve our Digital Hospital vision with their word class digital solutions and global experience!”

Dr. Choi, Donghoon – CEO

“Amazed by co-create workshop methodology and the outcome report which was a huge help to align and prioritize solution needs.”

Dr. Park, Jinyoung
Chief Hospital Planning & Management

Solution overview

By using a **rigorous and robust approach** to strategic account management and needs assessment helped us develop **8 solutions** which included our equipment, software and solutions within **“Smart hospital” solution bundles**. The client after this engagement selected five bundles to start their journey.

Focus



Strategically targeted this opportunity and Severance Hospital Group. Utilised a strategic account management approach including Daily Management review.

Know your customer



We engaged with all stakeholders including in a 2 day co-create sessions with executives, clinicians and staff (64+) to jointly develop the hospital’s vision to become a digital hospital

Solution approach



We sold a vision and solution underpinned with equipment & services

One clinical & technological capability



We understood the need to differentiate and position as a “smart / digital hospital” stay relevant so we have supported their continuous access to latest technology

One Philips



Philips’ ability to deliver “Smart Hospital” solutions, and act as a “trusted advisor” with regard to technology, strategy and innovation



Royal Mandaya Hospital Puri – a 7 years Strategic Partnership

Jakarta, Indonesia

Opened in early 2021, Mandaya Royal Hospital Puri will have over 350 beds, six operating theatres, over 100 outpatient examination rooms, three advanced medical centers – a Cardiovascular Center, an Advanced Oncology Center, and a Neuroscience Center – and 14 state-of-the-art specialist clinics

“Our philosophy aligns perfectly with Philips’ concept of connecting patients and providers for more effective, coordinated and personalized care. Building medical services around the wellness of the patient is exactly what we plan to offer at Mandaya Royal Hospital Puri.”

Dr. Benedictus R. Widaja
President Director
Mandaya Hospital Group

Solution bundle

The latest advanced technology and solutions from Philips, including the next-generation Azurion image-guided therapy system, the Ingenia Ambition MR, the world’s first MR for helium-free operations and the IQon Spectral CT, the world’s first and only detector-based spectral CT.

- 7 year Comprehensive Maintenance Services
- IT (ISP Enterprise, ISCV, PACS)
- Connected Care (ICCA, IGS)
- Ambient Experience
- Turn-Key Project Management
- Performance Optimization
- Financing services
- Selective 3rd party equipment

Yale New Haven Health – Project VIRTUAL

New Haven, Connecticut, United States

Developing a virtual roadmap for healthcare experiential, environmental, and technology solutions

Challenge

YNHH was looking to develop virtual demonstrators to convey current and future state experience journeys to convey a comprehensive roadmap to accommodate future-readiness strategies and convey opportunities for enhancing care delivery

Solution

Philips developed a virtual demonstrator to showcase opportunity areas for existing and next-generation solutions to optimize care delivery and patient/staff experiences.

8 Workflow scenarios

- Pre-visit / Approach
- Drop-off / Arrival
- Reception / Validation
- Unit Admissions
- Daily Patient Cycle
- Bedside Procedures
- Urgent Events
- Discharge / Transfer

76 Content Hotspots

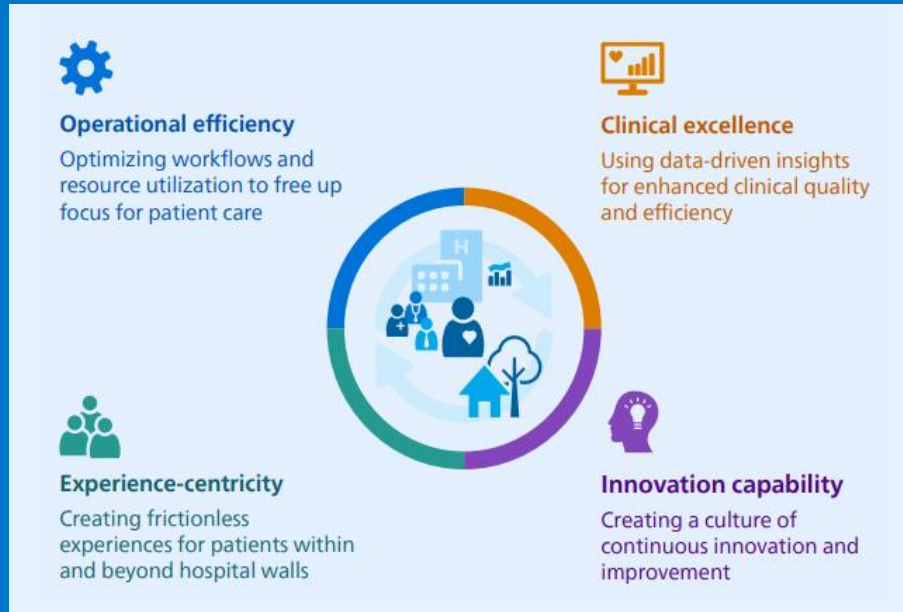
150+

Technology Solutions & Recommendations



In Summary

Moving closer to a Smart Hospital and utilizing integrated and contextualized data will help you achieve your operational, clinical and strategic goals



Examples of potential benefits

- Increased efficiency / productivity
- Reduced length of stay
- Lower cost or site of care
- Increased clinical collaboration
- May lead to enhanced decision making (prediction, machine learning & artificial intelligence)
- Extend clinical capability through virtual / remote care
- Increased staff capability
- Enhanced customer and staff experience
- Enterprise awareness

Transformation: 75% Process & Culture, 25% Technology & Design

Q&A



Thank you!

For more information about Philips smart hospital solutions, contact:

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Angus Cameron angus.cameron@philips.com



[Read](#) more about Smart hospitals in our new position paper – The hospital of the future won't be bound by walls – it will offer seamless experiences across care settings.

