Beyond the EMR:
Secure Digital Experiences

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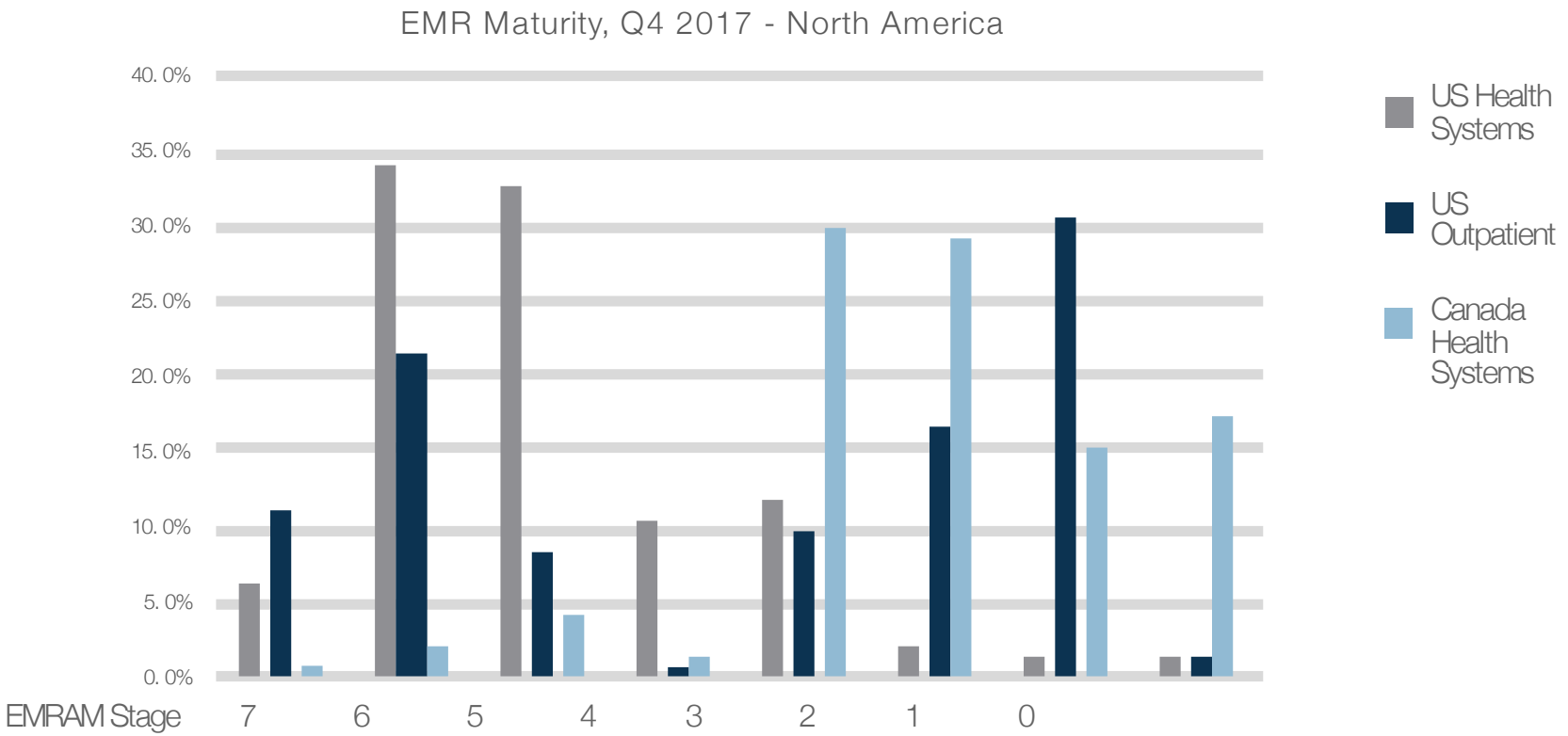
Electronic Medical Record (EMR) Technology is maturing



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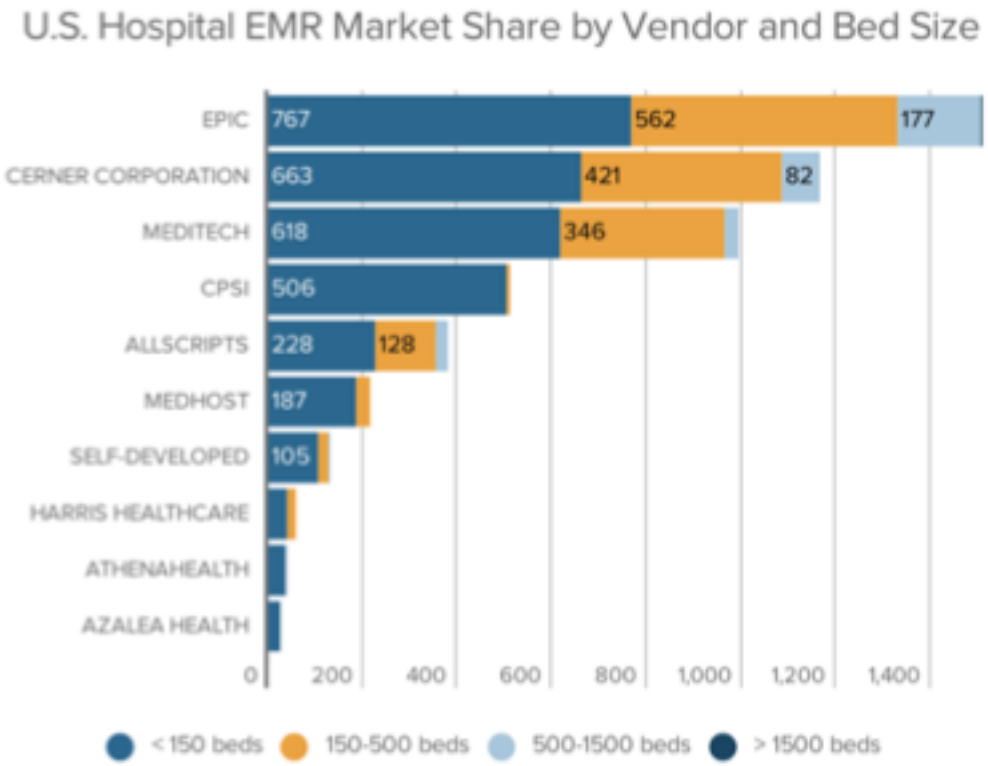
Source: HIMSS Analytics, EMRAM, https://www.himssanalytics.org

With EMR in place, "Digital Experiences" take a front seat



- Epic is market share leader in US
- Intersystems, Cerner, CSC, Epic being used Worldwide
- With maturity established, Providers are turning to other technologies to power Digital Experiences:
  - Mobility – Wireless, Security
  - Collaboration
  - Healthcare IOT

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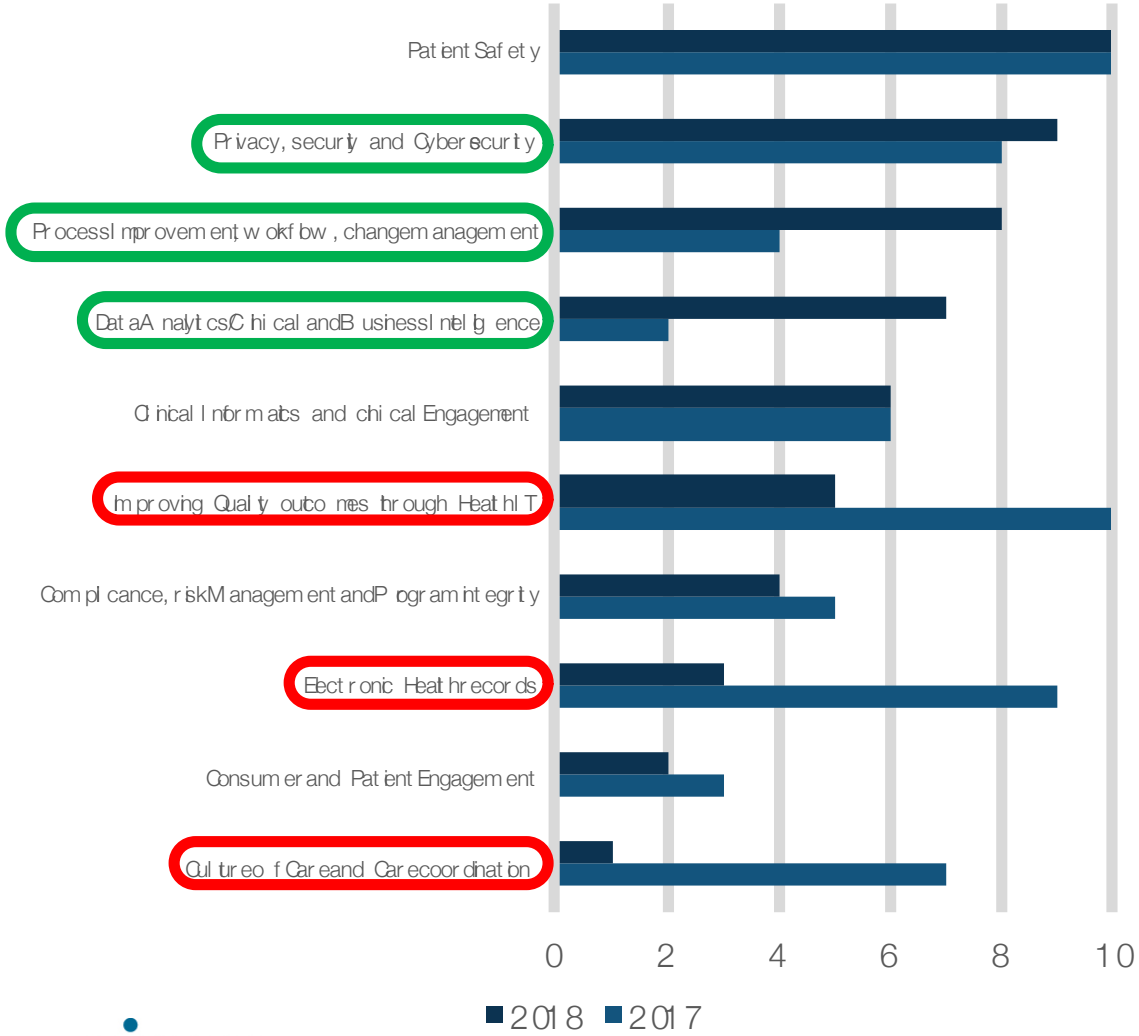
Source: HIMSS Analytics, EMRAM, https://www.himssanalytics.org

Hospital Top Priorities 1 to 10 of 24



- Shift from the business outcome being top concern to how to actually achieve it
- Ex. Less of a focus on EHR itself, transitions to how to get data and analytics and intel (EHR as source)
- Ex. Less focus on care coordination, shifting to process, and workflow improvements

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Source: HIMSS US Leadership Survey 2018

Healthcare environment is complex and challenging

Averages for a 500 bed hospital

15 to 20

IP devices in a typical hospital patient room[1]

6.6

Number of IP devices per FTE by 2020 (3.5 per person today)[2]

278

Number of unique IT systems required for care delivery[3]

85,000

Connected medical devices that need to be managed and secured[4]

40M

HL7 messages transmitted every 10 hour day[5]

3.4%

Operating margin for a typical community hospital[6]

Security

- Secure IoT and medical devices
- Defend network and data from attack

Patient experience

- Improve access to care
- Enhance the experience with connectivity
- Reduce the stress of navigating a hospital
- Enable virtual health visits

Clinical workflows

- Strengthen care-team communication
- Boost clinician productivity
- Simplify communication management
- Expand telehealth

IT & business operations

- Automate IT management
- Deploy and reliably run applications and workloads
- Streamline meetings and training

How patients and staff experience the network

Patient	How can you make my healthcare experience easy and seamless?
Clinician	How can I better engage with patients and other healthcare professionals inside the hospital and virtually?
Administration	How our clinicians see more patients and extend their reach beyond the hospital?
IT	How can I give visitors internet access and protect our hospital's network and medical devices?

Building a Strong Foundation

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Healthcare IT Challenge

43%

of IT time is spent on troubleshooting

Medical devices

IT needs to securely and easily onboard an ever-increasing number of user-less devices and instruments.

Clinician & patient devices

Clinician and patient devices must have the right access and priority and share the network securely.

IoT

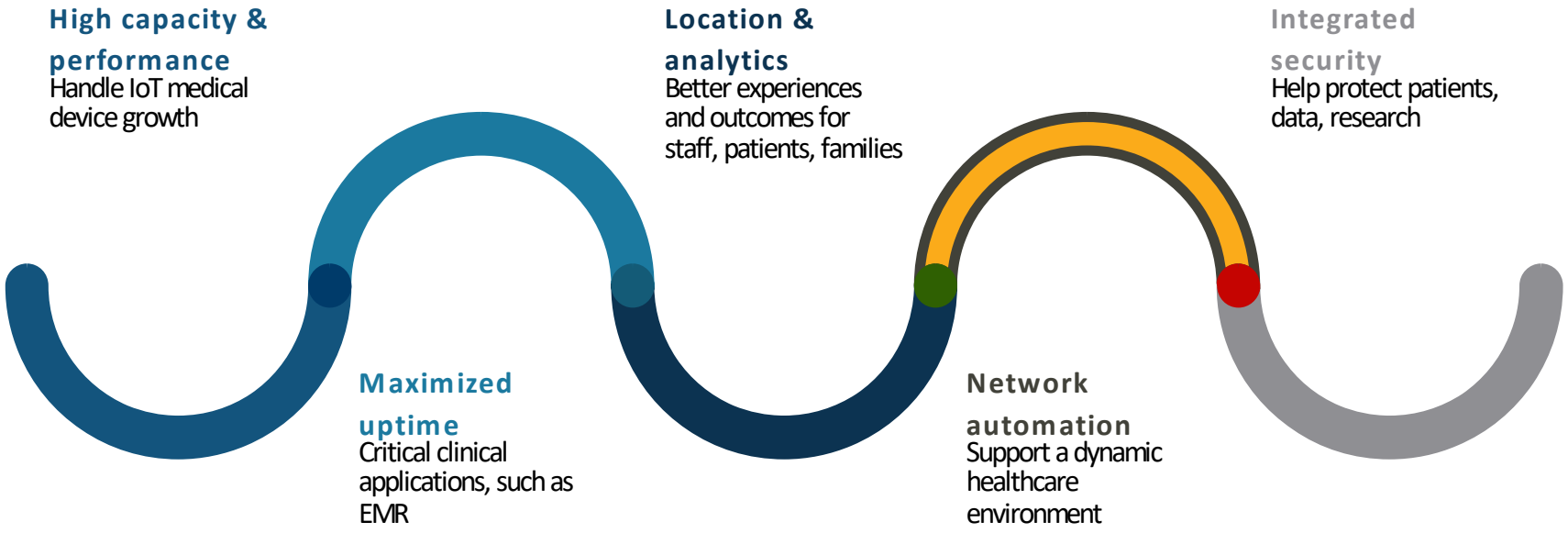
Connect and power lighting, controls, and systems and extend network policy to IoT,

Identifies and securely segments life-support systems

Watches traffic for bad behavior

Ensures high-quality, real-time services

A platform for clinical services



What is INFRAM?

HIMSS Analytics Infrastructure Adoption Model (INFRAM)

For over a decade, HIMSS Analytics has guided healthcare organizations around the globe in technology adoption and implementation through models such as the Electronic Medical Record Adoption Model (EMRAM) that create benchmarks and standards for Healthcare IT.

Now, *HIMSS Analytics is working with Cisco to develop INFRAM*, a staged model for technology infrastructure adoption and maturity of modern, digitally-connected healthcare, all while reducing cyber risk.

By utilizing INFRAM, senior IT leaders can help *improve care delivery, reduce cyber risk, and create a pathway for infrastructure development tied to business outcomes*.

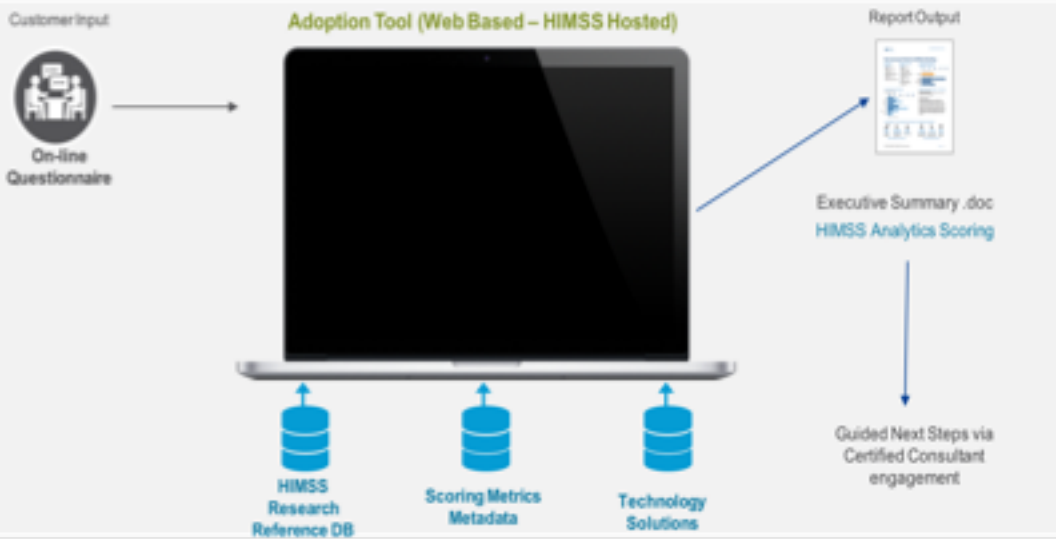
How Does INFRAM Work?

1. ANALYSIS
Hospital's Information systems infrastructure

2. CLASSIFICATION
Eight-level model classifying digital infrastructure in terms of relevant operational outcomes

3. STRATEGIC ROADMAP
Tailored plan for each technology area outlining effort needed to increase INFRAM Score

4. COMPARISON
Benchmarking of Hospital's INFRAM Capabilities against Peers



Powering Digital Experiences or… IOT in Healthcare

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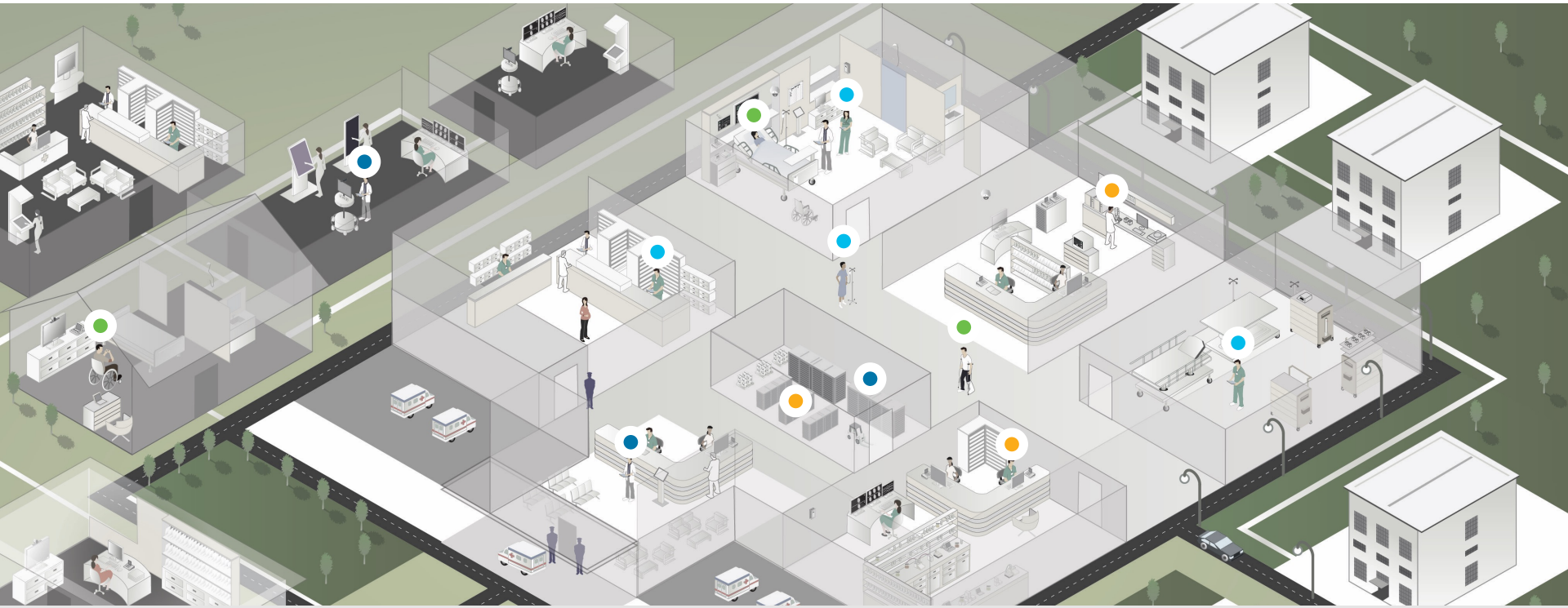
Components of Healthcare IoT



Streamlining clinical workflows	Personalizing health and wellness	Protecting patients and data	Optimizing business and IT ops
• Equipment tracking • Patient & staff tracking • Environmental monitoring • Process monitoring • Clinical mobility	• Remote monitoring • Mobile experiences • Wayfinding	• Network segmentation • Access control • Ransomware defense	• Equipment maintenance • Building management • Network optimization

Streamlining clinical workflows

The problem

- Time spent finding equipment
- Inefficient processes & disjointed care-team communication
- Wasted inventory, compliance protocol
- Lack of patient flow visibility, point of care delays

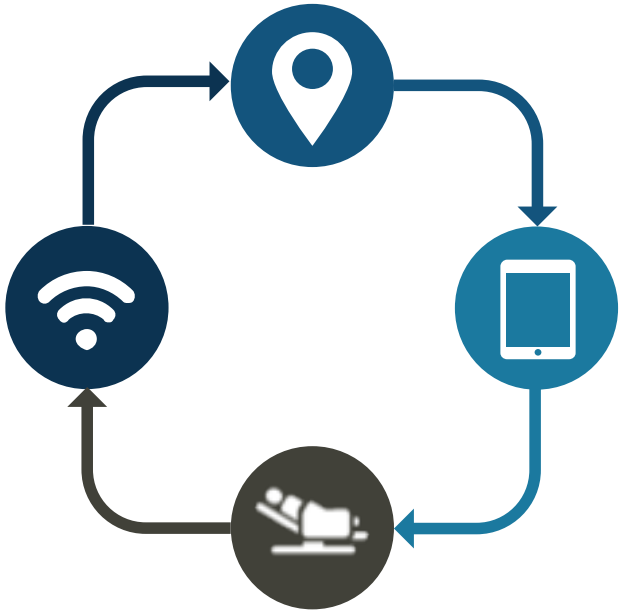
The solution

- Equipment tracking
- Workflow optimization of processes, people
- Perishable environmental storage tracking
- Patient tracking

Healthcare asset management market will be **$29.6B** by 2020, up from just **$6.7B** in 2015

Seamless clinician experience
Mobility

Implementation
- Easy to manage
- Highly secure
- Always on



People & asset tracking
- Save time finding equipment and patients
- Improve asset utilization
- Monitor and optimize workflows

Patient interactions
- Enhanced registration and informed consent

Clinician communication
- Optimized Wi-Fi for clinical video and messaging

Celebration Health Florida Hospital

Florida, U.S.
237 beds

Cisco RTLS improves clinical operations, increasing staff and patient satisfaction.

The skill to heal. The spirit to care.

Challenges

- Improve nursing workflows
- Reduce staff turnover
- Improve rounding practices

Solution

- Cisco network and wireless platform as foundation
- Cisco RTLS to analyze workflows and processes
- Monitoring of clinical events
- Analytics to examine workflow, staffing, and physical layouts

Outcomes

- Hourly rounding compliance increased to ~90%
- Increased time spent with patients
- Nurse-separation rates reduced to ~8.5%
- Nurse variability decreased by 20%
- Higher productivity for nursing shifts

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Personalizing health and wellness

The problem

- Care limited to hospital visit
- Difficulty navigating hospital
- Wireless environment not optimized for the use of mobile devices

The solution

- Remote monitoring, wearables
- Wayfinding
- Cisco and Apple Fast Lane

~50% of patients with chronic diseases do not comply with medication regimens.
With educational support, compliance improves.

Seamless patient experience
Mobility

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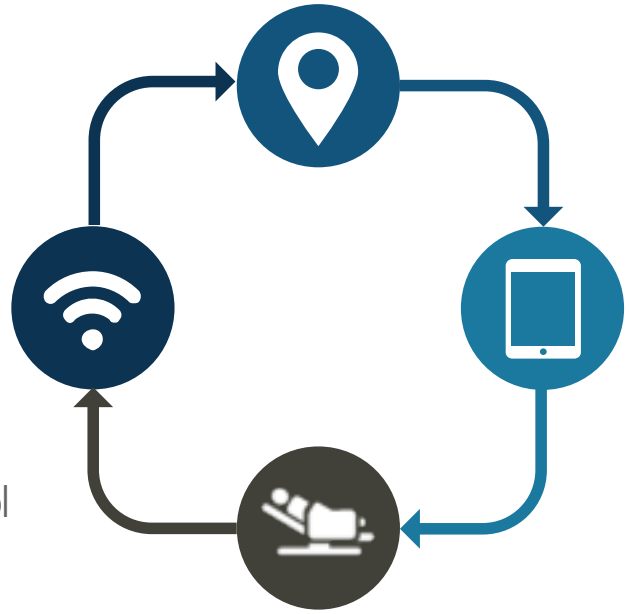


Wayfinding & location analytics
- Stress free facility navigation
- Arrive to appointments on time
- Overcrowding prevention

Bedside experience
- Room temperature control
- Care plan visibility
- Entertainment
- Proximity marketing

Guest connectivity
- Secure, reliable, easy to access Wi-Fi for patients and visitors

University Health System (UHS)

San Antonio, Texas, U.S.
Over 7,000 employees

Visiting the hospital makes a lot of people anxious. So when planning its new 10-story, million-square-foot Sky Tower, UHS looked for ways to reduce stress.

Just making it easier for patients and visitors to find their way to a doctor's office, lab, or the cafeteria improves the patient experience."

—*Mark Webb, CEO, Pediatric Services, University Health System*

Challenges

- Provide great patient and visitor experience
- Help people find their way around million-square-foot building
- Maximize reimbursement rate from federal government.

Solution

- Built Cisco wireless network, which tracks visitor location
- Engaged Etelu to develop mobile app for wayfinding and more

Outcomes

- Improved patient and visitor experience, a factor in reimbursements
- Developed and deployed mobile app in less than three months

Protecting patients and data

The problem

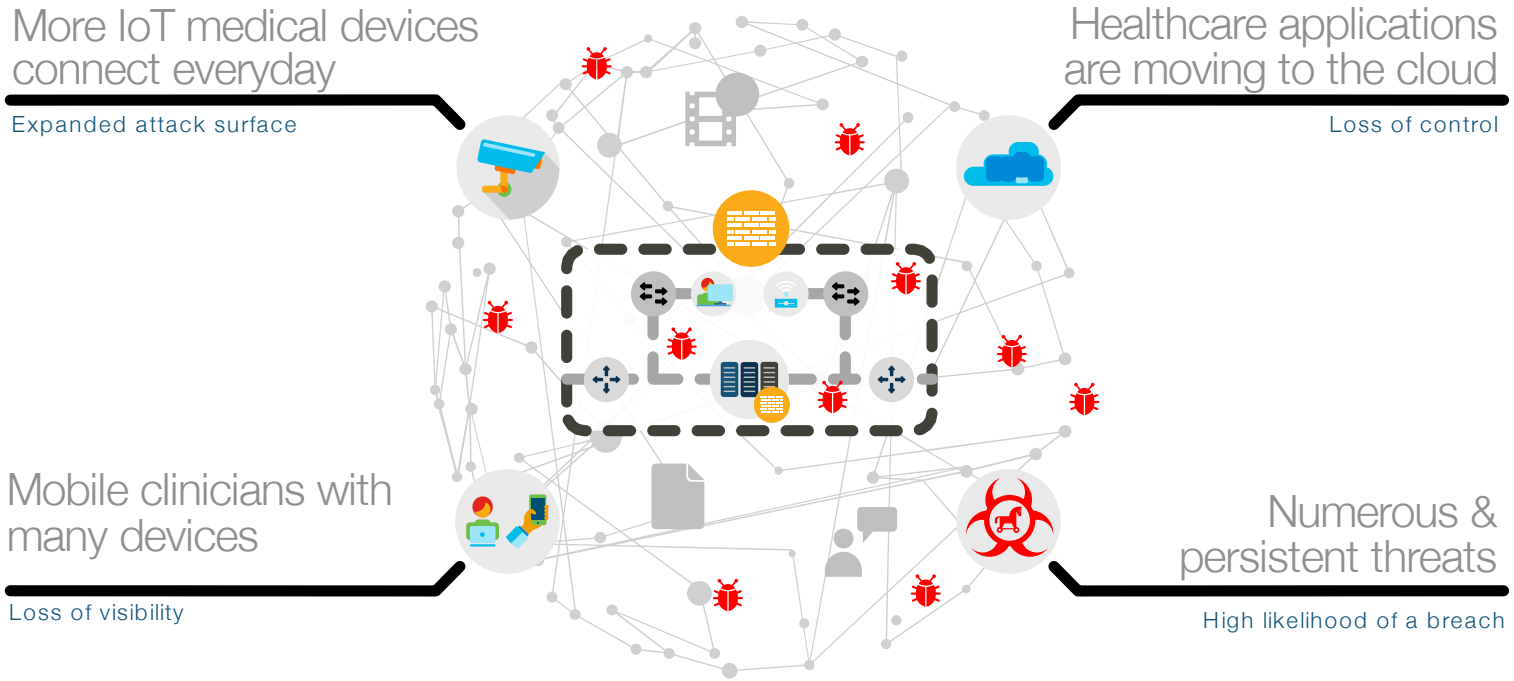
- Lack of security protocols for connected medical devices
- Ransomware

The solution

- Network segmentation, device libraries
- Access control, network-as-a-sensor threat detection, malware defense

Only **17%** of medical-device manufactures are making significant efforts to prevent device attacks.

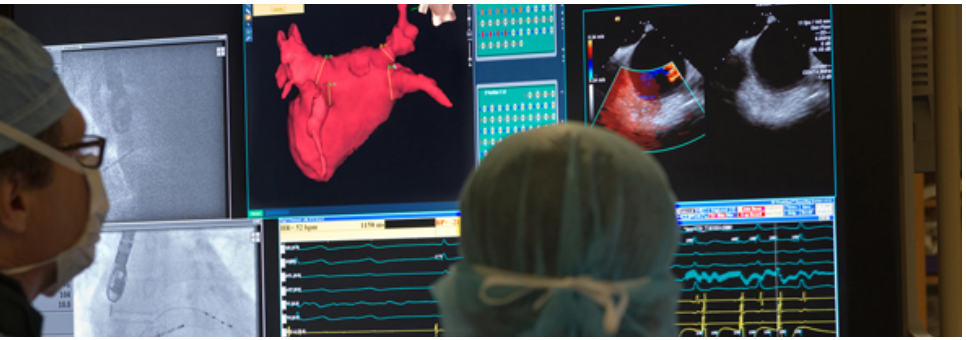
A new era of digitization…
Brings a new era of security challenges in healthcare



Sentara Healthcare

Virginia & North Carolina, U.S.
28,000 employees

With 300-plus care sites, including 12 hospitals, Sentara Healthcare needs to provide a highly secure, digital care environment. They use Cisco technologies to stay ahead of the innovation curve.



We're no longer tied to managing individual appliances; it's now security with automated simplicity."
–Chad Spiers, Director of Information Security, Sentara Healthcare

Challenges

- Remain at the forefront of security
- Help IT meet growth demands securely and quickly
- Insight into network traffic
- Secure access of medical devices

Solution

- Reliable services with Cisco DNA, wireless, and switching
- Access latest solutions with Cisco ONE
- Enforce consistent policies across the network with Cisco TrustSec
- Control network access with Cisco ISE
- Gain visibility and analysis of network traffic with Cisco Stealthwatch

Outcomes

- Greater levels of protection for patients and healthcare workers
- Less chance of malware contagion between systems and applications
- Faster threat response and remediation capabilities
- More time for IT to spend innovating and combating new risks

Optimizing business and IT ops

The problem

- Equipment breakdown
- Wasted facility resources
- Volume of data from connected devices, network traffic

The solution

- Preventative equipment maintenance
- Building and energy management
- Data center management, network optimization

In the US, **30%** of energy used in commercial buildings is wasted.

Milton Keynes University Hospital

Milton Keynes, U.K.
3,500 employees

Milton Keynes University Hospital wanted its staff to be able to operate at peak performance. But, the IT infrastructure was out-of-date and failure prone. A unified Cisco network is making digital healthcare possible.

Now we don't get any outages, and at 10 Gbps, people can instantly get to the data and apps they need to work efficiently."
– Craig York, Associate Director of IT, Milton Keynes University Hospital NHS Foundation Trust

Challenges

- Improve patient outcomes
- Enable digital healthcare
- Reduce IT costs

Solution

- Cisco LAN for nonstop network availability
- Cisco wireless network for fast, secure mobility
- Cisco Unified Communications (UC) for flexible, efficient communications

Outcomes

- Reduced network downtime from several hours/month to zero
- Better phone system with five-figure savings
- Improved Wi-Fi access everywhere

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Questions?

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