Emerging Technologies in Healthcare:

Driving Transformational Change at Kaiser Permanente

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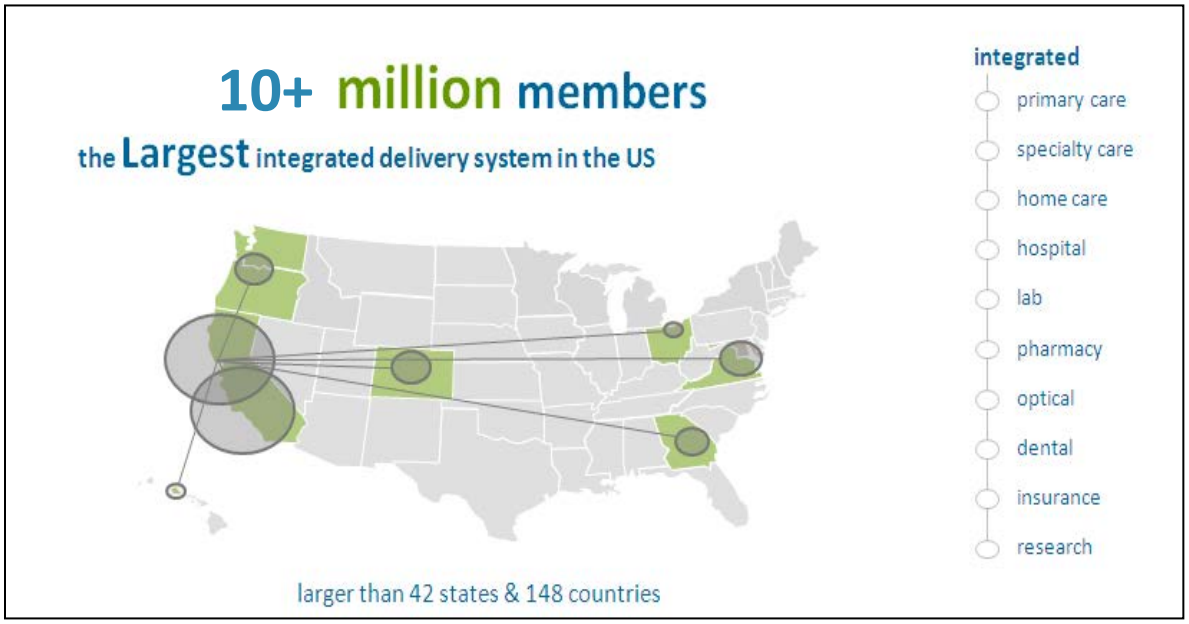
Kaiser Permanente Today



53.1 billion operating revenue (2013)

175,000+ employees

17,000+ physicians

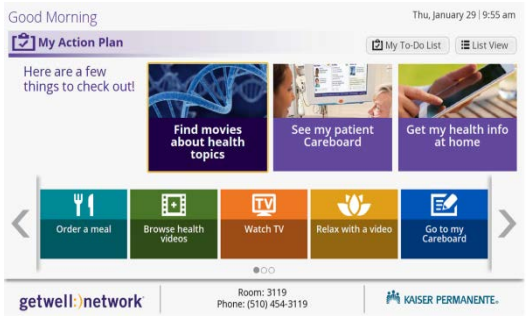
49,000+ nurses

38 hospitals

620+ medical office buildings

Technology trends in healthcare facilities are being driven to improve the care experience and to enhance efficiency and effectiveness, blending efficiency and new operating models to achieve a value added member experience.

- Highly Efficient
- Improved Member Experience
- Greater Clinician Connectivity
- Enhanced Environment



Technology Base Line – What goes into new clinical facilities

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Computers:
- Desktops & Laptops
- Mobile Carts
- Point of Sale (POS)
- Barcode Readers

Phones:
- VoIP
- Wireless VoIP Phones
- iPhones – Selected Staff & Depts

Printers:
- Networked Printers
- Barcode Printers
- Networked Copiers
- Fax Machines

Multimedia:
- Digital Signage
- Rx Boards
- Waiting Room Screens (Selected Sites)

Network:
- Wired
- Staff & Guest WiFi
- Distributed Antennae System (DAS)

Mobility and Video:
- RFID
- Interactive Patient Care (IPC)
- Telehealth
- Video Conferencing

Facility:
- Physical Security Systems
- Surveillance
- Building Systems
- Nurse Call

Clinical Applications and Biomed
- KP HealthConnect
- Ancillary Systems
- Local Servers (Pharmacy, File & Print, etc.)
- Queuing Systems
- Networked Biomed systems

Technology Trends Impacting Facilities

TELEHEALTH/VIDEO

INDUSTRY TREND:
350K telehealth users is expected to grow to 17M by 2018

LIKELY OUTCOME
Increasing numbers of tech savvy users will accelerate telehealth adoption

Network design must support increased video traffic

Exam room infrastructure needs to support real-time teleconsults

Clinician workspace needs to be designed to facilitate eVisits

MOBILE

INDUSTRY TREND:
90% of Americans have a cell phone, 58% have a smart phone.

LIKELY OUTCOME:
Staff and members will use mobile everywhere.

Members will have the ability to connect with a variety of KP mobile apps.

WiFi is critical, cellular signal needs to be available (Small Cell)

Indoor wayfinding will require some additional sensors (NFC, BLE)

Increased demand for power to charge devices

TEXT

INDUSTRY TREND:
73% of Adults and 95% of 18-29 years olds use text to communicate.

LIKELY OUTCOME:
One-way text is used in many industries such as airlines to notify customers, two-way text is rapidly approaching reality.

Local facilities will need access to text messaging to notify members regarding wait time, running late, Rx is ready, appointment reminders

Secure text messaging between staff and between staff, members, and family is starting to be implemented

INDUSTRY WATCH:

Things of note happening in the HC industry today … Predictors of things to come…

IMPACT

Technology Trends Impacting Facilities

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LOCATION SERVICES

INDUSTRY TREND:
Location helps optimize workflow for assets, staff, and customers

LIKELY OUTCOME:
Kaiser currently has 200K+ RFID tags to manage assets. RFID under review to enable staff, workflow, and supply chain.

Sensor grids will require power to pickup signals to support location accuracy.

Spectrum management will be required to ensure wireless signals are not interfering with each other.

PAPERLESS

INDUSTRY TREND:
90% of customers prefer electronic receipts over paper. Customers like green and don't want to carry paper.

LIKELY OUTCOME:
Shift from customer entered paper forms to electronic

Reduced need for printers over time. Future electronic delivery of receipts, AVS, and education.

Options for customer entered data at home, using their own devices (guest WiFi), and Kaiser supplied devices.

CLOUD

INDUSTRY TREND:
Healthcare News states 2015 is 'The Year of Healthcare Cloud Adoption'

LIKELY OUTCOME:
Cloud provides elastic compute capability with high security

Networks must be reliable to access data center servers and cloud resources.

Less need to host servers locally reduces need for server room expansion capability.

INDUSTRY WATCH:

Things of note happening in the HC industry today … Predictors of things to come…

IMPACT

Technology Trends Impacting Facilities

IoT – INTERNET OF THINGS

INDUSTRY TREND:
Everything is being connected.

LIKELY OUTCOME:
Smart devices, connected cars, wearables. Smart buildings, smart cities. Business intelligence and crowd sourcing

Technology standards and security now apply to biomedical equipment and building systems

Surveillance systems do more than security

Everything becomes a sensor enabling business intelligence

Building Operations Centers are becoming a reality

SECURITY

INDUSTRY TREND:
Security breaches heighten security awareness. (Target & Home Depot)

LIKELY OUTCOME:
Cyber and physical security vulnerabilities apply to connected non-IT systems.

Connected Environment systems and devices must be reviewed.

Physical security to ensure member and staff security is growing in importance.

RFID systems will be extended to reduce theft help reduce cost.

ADVANCED ANALYTICS

INDUSTRY TREND:
Clinical decision support leverages big data and analytics.

Networks must be reliable to access data center servers and cloud resources

INDUSTRY WATCH:

Sloan-Kettering is partnering with IBM Watson to help diagnose cancer

IMPACT

Technology Trends Impacting Facilities

CUSTOMER EXPERIENCE

TINDUSTRY REND:
92% of companies view customer experience as a top priority.

LIKELY OUTCOME:
Mobile, self-service, services on 'my terms' contribute to the experience resulting in greater customer engagement and activation

Tools and activities to engage customers including digital signage, BMI & Vital Signs Kiosks, Facility Based Classes (i.e. Yogo, cooking), Community Calendar.

Expanded hours implications on workflow, physical security.

ROBOTICS

INDUSTRY TREND:
Use of healthcare robots is expanding.

LIKELY OUTCOME:
Robots help extend the hands of experts.

Network and WiFi connectivity. Many of the robots are wireless. Some robots like Tug Carts need to be connect to the facility infrastructure. (elevators)

ENHANCED ENVIRONMENT

INDUSTRY TREND:
Multiple functions that were traditionally segregated are being brought together.

LIKELY OUTCOME:
Technology will untether people from queues and physical spaces, allowing them to fully maximize their time and utilize the resources that are available.

Wireless and Cellular connectivity is critical and signals needs to be available throughout our facilities and campuses.

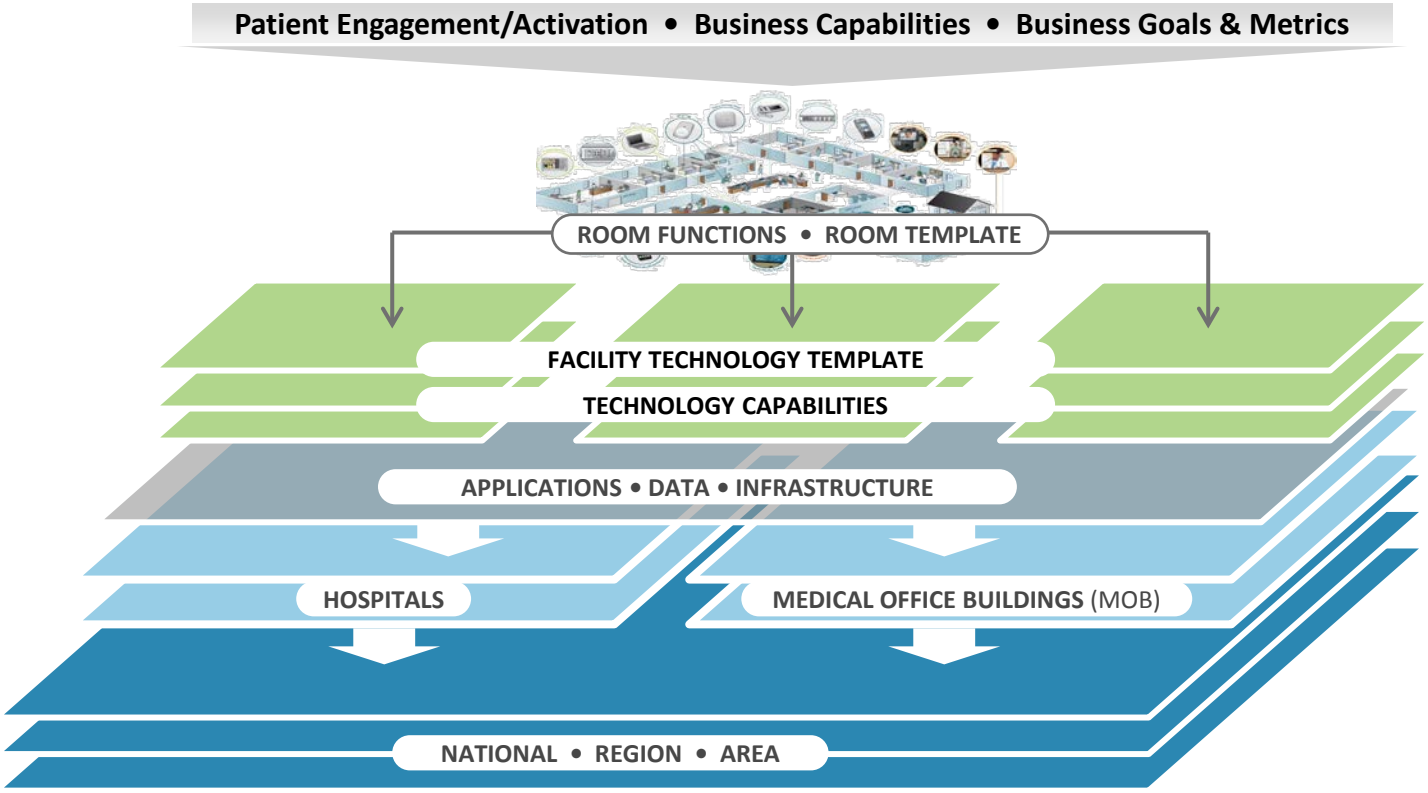
INDUSTRY WATCH:

Robots include Tug Courier Carts, Intouch Rounding Robot, Double Robotics, Kubi Remote iPad Positioning Robot,, Da Vinci Surgery Robots. Xenex Room Sterilization Robots

IMPACTS

TECHNOLOGY WORKSTREAM APPROACH

Creating common business capability-driven technology and standard facility technology templates approach ensures enablement of seamless patient experience and change management across new and legacy facilities



Objectives

- Standard Room Functions, Room and Facility templates.
- Business Capability Driven Technology Architecture.

Process

- Leverage existing work that has been incorporated into Kaiser's newest hospitals
- Incorporate new innovations to enhance patient experience, staff satisfaction, and improve care
- Start with four to five key priority areas and finalize and operationalize technology
- Incrementally move to the next set of priority areas
- Create a model to sustain the hospital of the future

Technology Challenges

"National Estimate:

$1.17 billion is wasted every year due to the lack of commonly adopted standards in the US. 63% of this waste ($740m) is estimated to be the responsibility of healthcare providers."

- From 2013 West Health Institute – The Value of Medical Device Interoperability

What is Connected Environment?

A strategic initiative to influence medical device design and manufacture towards systems that are

- More reliable
- Quicker to implement
- Safer to operate in our connected environment

What is Connected Environment?

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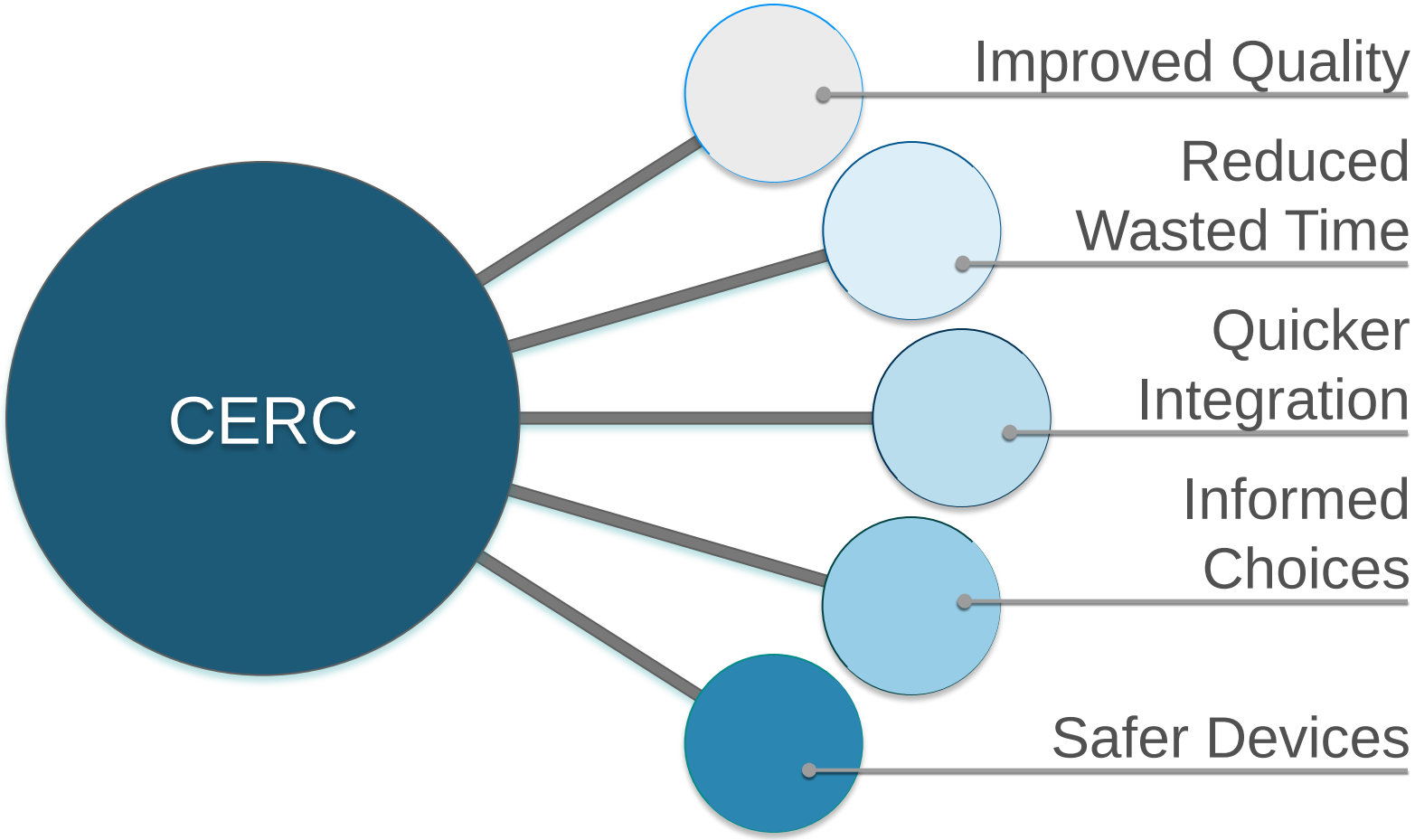
Development of a framework called Connected Environment Requirements Catalog (CERC)

Compilation of interoperability requirements for medical devices in a catalog format covering

Improved Strategic and Business Planning



Example Requirements

Here is a small sample of requirements within the CERC

Network

Ref ID	Key Requirement	Rationale	Priority (Mandatory; Preferred)	KP Adoption Time-frame (Current; Yr if Future)
NT.0001	Portable devices, when in use, must be able to be moved to different LAN segments without readdressing and still work (DHCP capable). Device connection protocol must be routable and capable of dynamic addressing scheme	Supports mobile care and patient transitions within the care setting	Preferred	Current

Reliability and Risk Management

RR.0007	The solution must support secure communication of data between components and to ancillary applications	Supports data reliability	Preferred	Current

Reliability and Risk Management

EA.0002	Integration API's for medical equipment should enable KP to receive real time updates for equipment state (e.g. in use, not in use, etc.)	RFID is expected to be used to increase efficiency, therefore systems should have APIs ready to receive and send status data, e.g. utilization, feeds to further automate workflows. Current preference is for SOAP based APIs	Preferred	Current

Closing

"**Standardize to achieve success** - Shared goals and standards for interoperability - and widespread use of standards and tools - will improve the safety, effectiveness, and efficiency of medical technology"

- 2012 AAMI/FDA Interoperability Summit Summary

Thank You

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