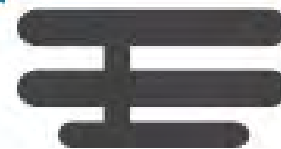


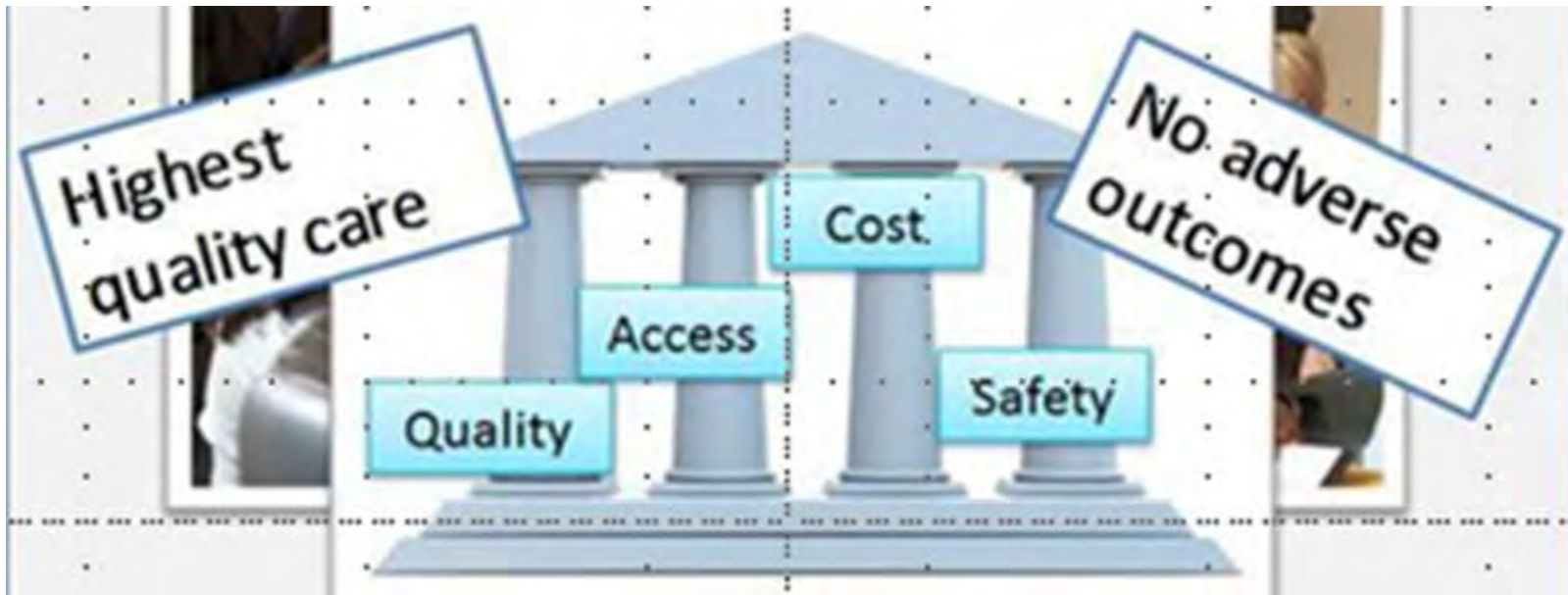


*Driving Innovation in  
Health Care with a  
Consumer Digital  
Strategy*



James Brady, PhD, FHIMSS  
Area CIO, Kaiser Permanente Orange County  
March 2, 2015

## Today's Challenges



**Healthcare Reform - EHR Adoption - Population Health - Interoperability - Security**

Business models and industries are evolving quickly as technology innovation, consumer empowerment, and competition from both traditional and non-traditional entities increase.



**Empowerment of the Individual**



**Intense Competition and  
New Entrants**



**Technology Innovation**

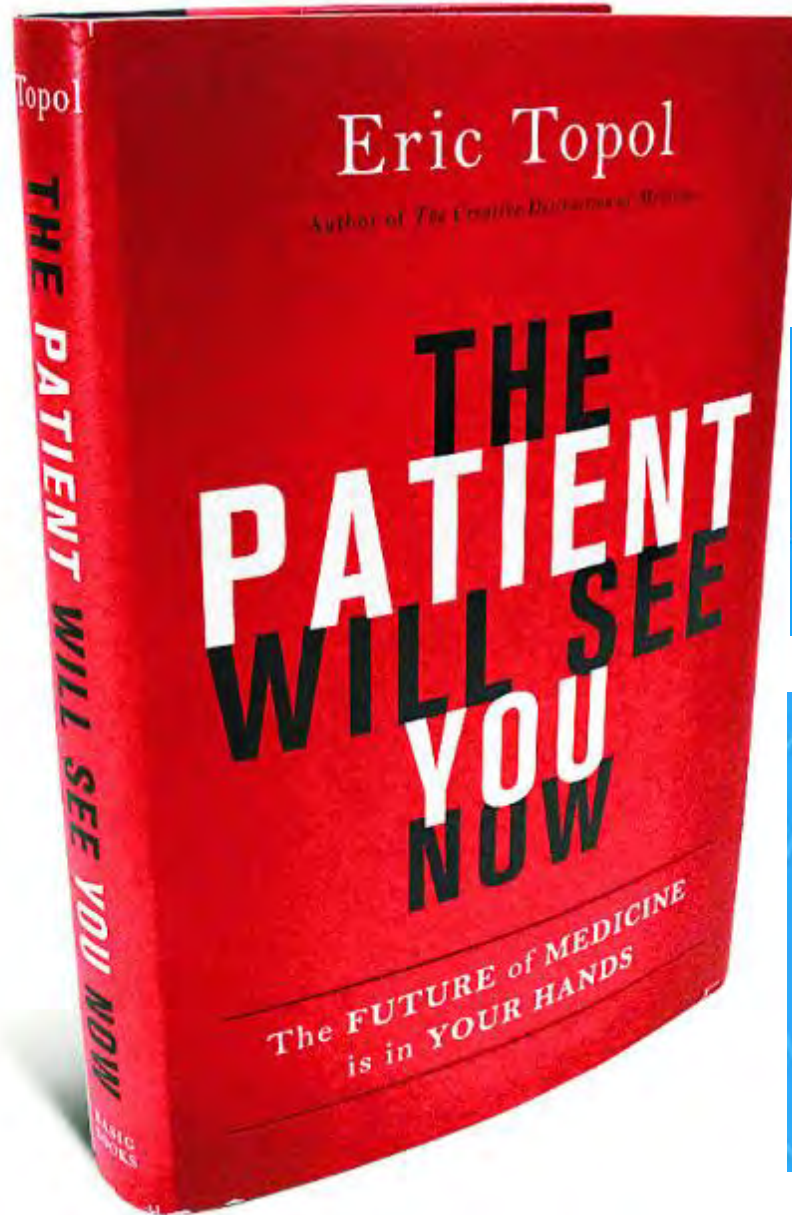


Business models  
across all industries  
are evolving at a  
faster pace

**Our Member's Needs Are Changing - Our Clinician's Needs Are Changing Too!**



Traditional  
model of care



New model  
of care



	<b>Old Approach</b>	<b>New Approach</b>
<b>Care</b>	Episodic visits	Continuous relationship
<b>Management</b>	Clinician	Clinical team
<b>Decision-making</b>	Training and experience	Evidence
<b>Control</b>	Care system	Patient
<b>Variability</b>	Clinician autonomy	Patient needs, preferences
<b>Information flow</b>	Restricted	Encouraged
<b>Process visibility</b>	Secrecy	Transparency
<b>Safety</b>	Responsibility of clinician	Responsibility of system
<b>Needs</b>	System reacts	System anticipates
<b>Financial goal</b>	Reduce cost	Reduce waste

Adapted from Kohn, Corrigan, & Donaldson, 2000, Table 3-1

## 'Shift Left' – Transformational Value

Andy Grove, Intel coined the term 'shift left' in 2006 which is really about providing the right level of care based on acuity. Fast forward to 2013, technology has improved, many of the things we wanted to do are now possible. Innovation can help shift care to lower cost models while maintaining quality.



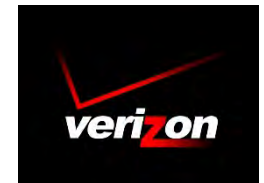


## Implications

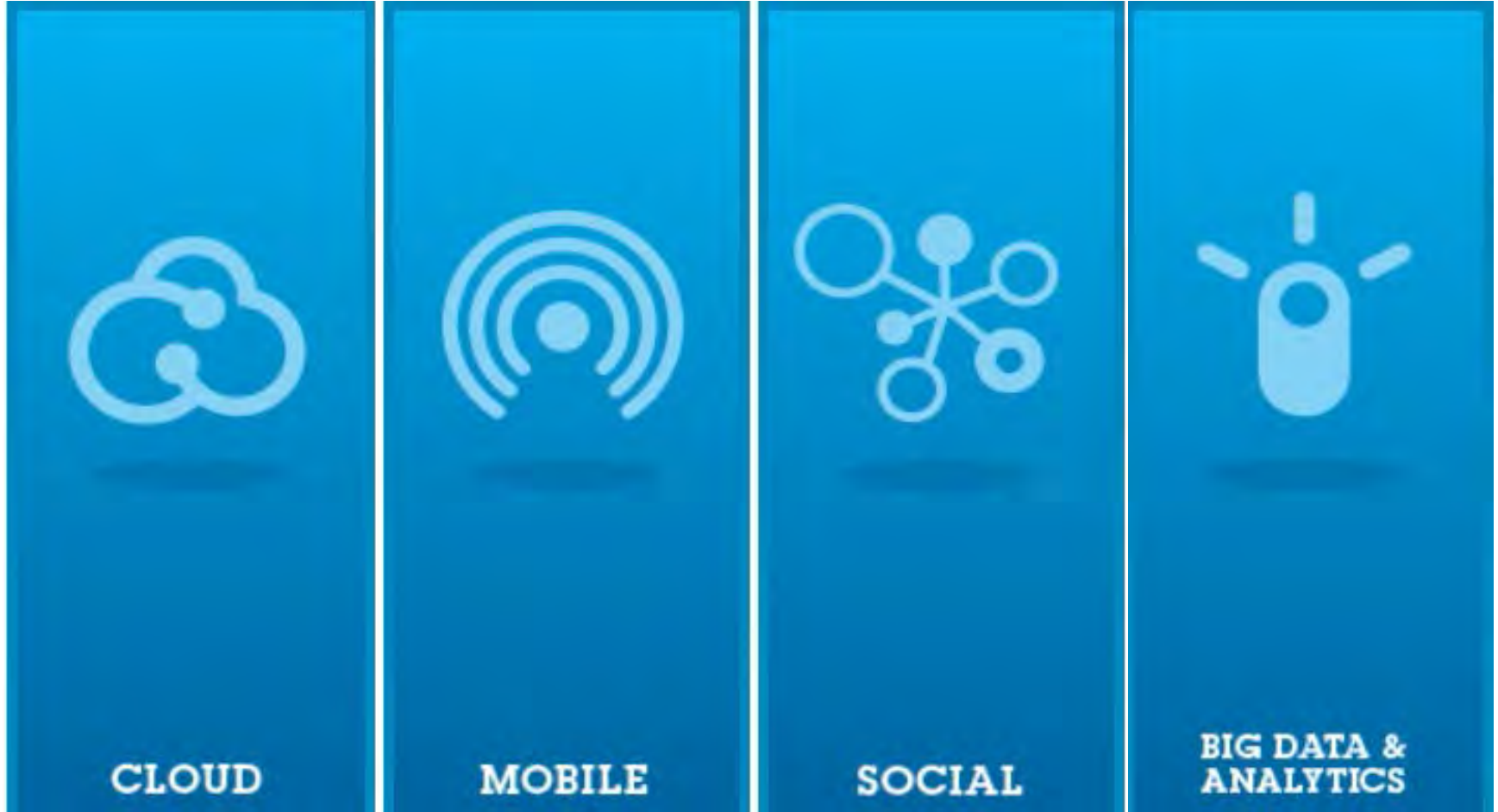
- Incentivizes efficiency and development of higher quality products and experiences

## Implications in Health Care

- Must be aware of non-traditional competitors in healthcare (e.g., One Medical)
- Traditional payors and providers increasingly need to find ways to continue to provide superior care at lower cost



# Technology Innovation is the Differentiator





## SYSTEMS OF ENGAGEMENT

### User Interface

(social media, digitization, connected devices, sensors, mobile apps)

MOBILE APP

### Engagement Layer

(technology partnerships with partner organizations, APIs)



Patient Portal, etc.

## SYSTEMS OF RECORD

### Examples



EHR



Lab



ERP/SCM



Claims



Membership

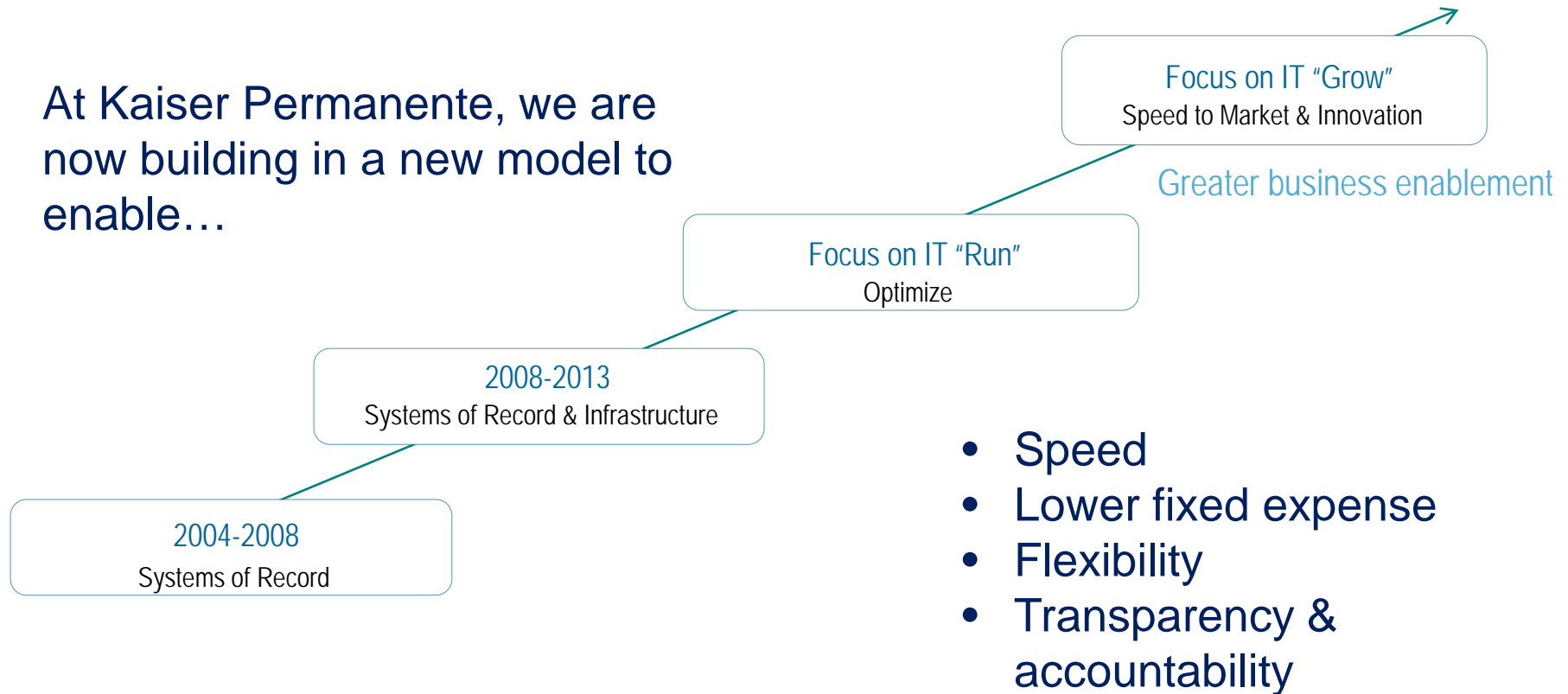
## FOUNDATIONAL ENABLERS

### Examples

Infrastructure As A Business, Big Data Management, Data Sharing Standards, Patient Privacy & Information Security, Cloud Computing

New technologies provide opportunity to build greater efficiency, while creating flexibility and long-term capacity for investment

At Kaiser Permanente, we are now building in a new model to enable...

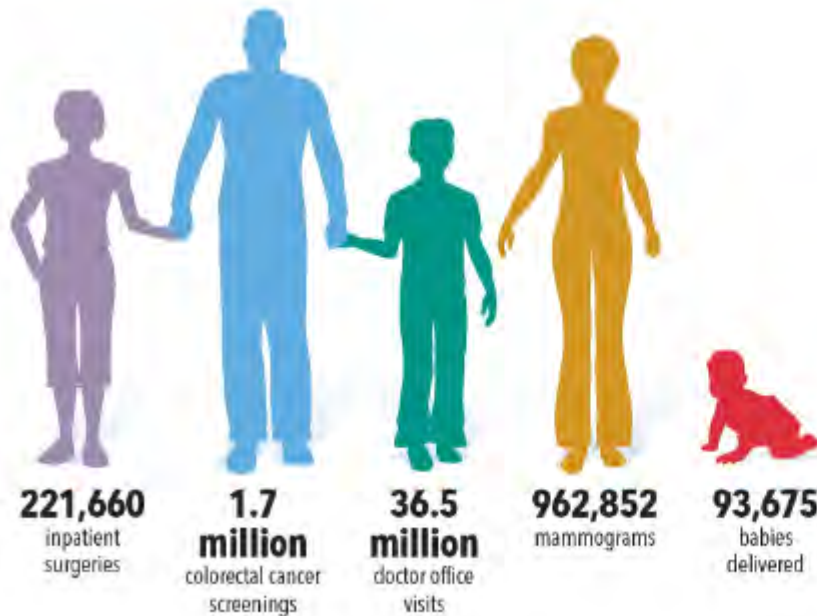
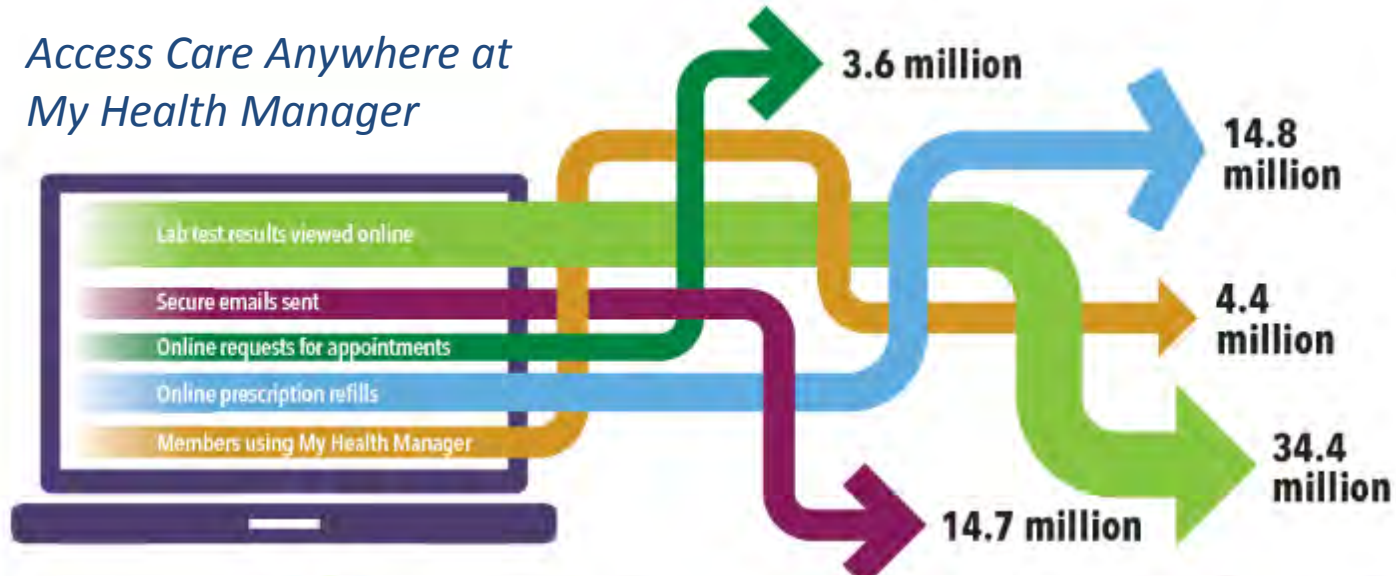




- The **LARGEST** nonprofit health plan in the **U.S.**
- Nearly **\$60 billion** revenue
- More than **9.6 million** members
- Nearly **175,000** employees and clinicians
- Over **17,000** physicians and **48,000** nurses
- Serving **8 states** and the District of Columbia
- **39** hospitals, **650+** medical offices  
**60 million+** square feet
- Over **275,000** desktops and **25,000** servers
- The **LARGEST** private EHR install in the **world**  
with **40M** unique records in **6TB** data
- **70** years old organization

# Kaiser Permanente by the Numbers

*Access Care Anywhere at My Health Manager*



## AWARDS



**LEAPFROG**  
"A" Grades for Hospital Safety



**NCQA**  
Health Insurance Plan Rankings



**JOINT COMMISSION**  
Top Performers for Quality and Safety

# The Health Care Mega Trend is Here!



fitness empowerment  
community **wellness**  
control balance goal-setting  
stress-free friends and family  
**happiness**

**Total HEALTH**



red tape  
invoices  
confusion  
sick care  
greed  
money  
insurance  
fine print  
safety net  
profit  
bureaucracy  
Lack of control

**HEALTH CARE**



# Imagining Care Anywhere

<https://www.youtube.com/watch?v=NZm5gJikhgE>

<https://www.youtube.com/watch?v=gxz9ZVvduGc>

## Transforming the Out Patient Visit Experience

### Hybrid Exam Room Concept



Monitor for patient education, video consult, displaying BMR or images for patient

A small, mobile furniture solution accommodates documentation using a laptop, thereby reducing the footprint used by larger technology carts.

Sliding 'barn door' design increases the amount of usable space in the exam room

Convertible sofas are adjustable and easily convert to exam benches.

Traditional exam attributes could be concealed to change the character of the exam room, but be available when needed.

#### Pre Appointment Innovation

- Online forms
- Digital Facility Wayfinding

#### Registration Innovation

- Express Check In
- Registration Tablet App
- Waiting Room Notification
- Digital Membership Card
- Wait Time Calculations

#### Exam Room Innovation

- Teleconsults
- Personalized Patient Education
- Automatic Sign On
- Rx Fill Notifications
- Ancillary Check In and Queuing

#### Back Office Innovation

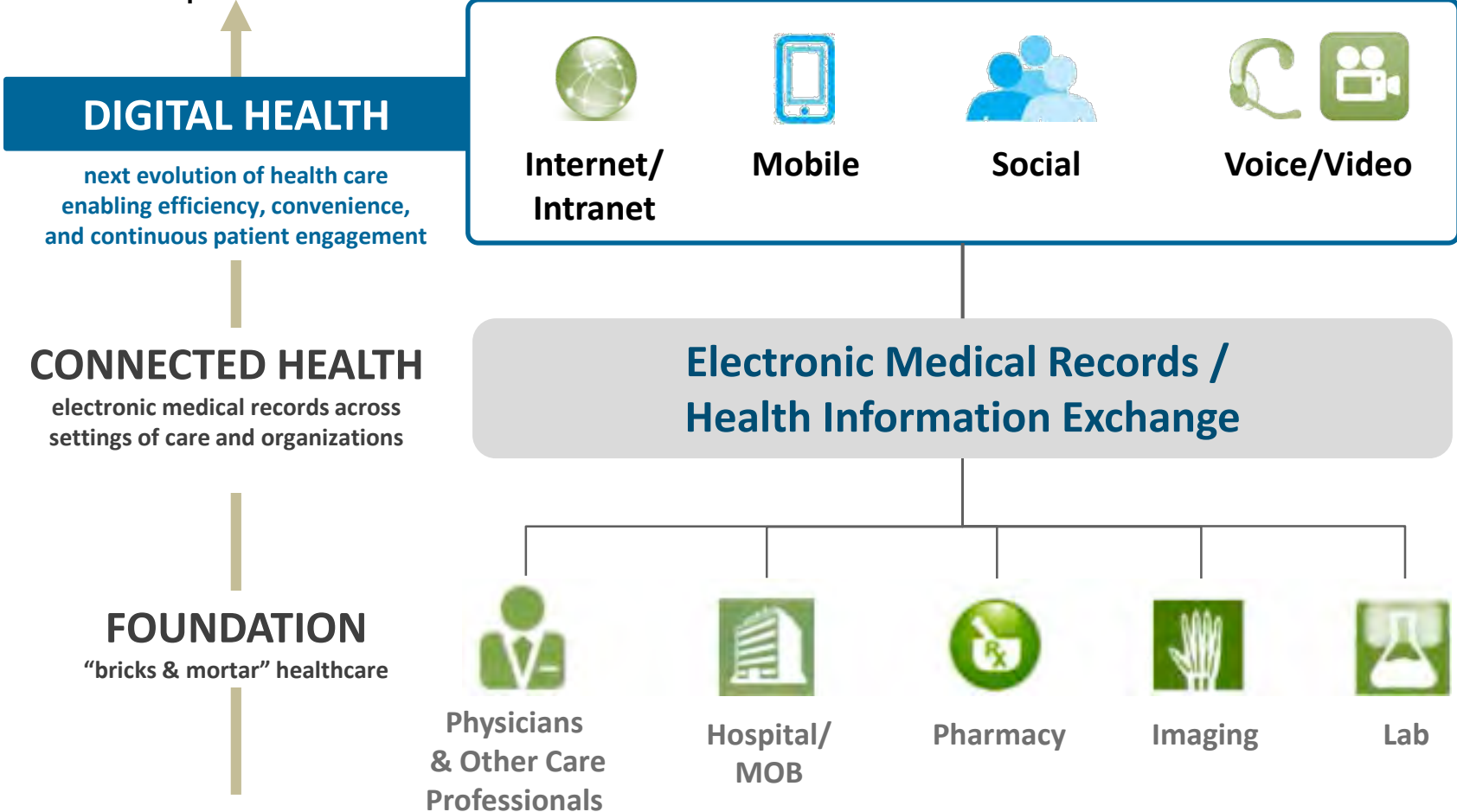
- Staff Mobility
- Outpatient Dashboards

# Bringing Care to the Retail Environment





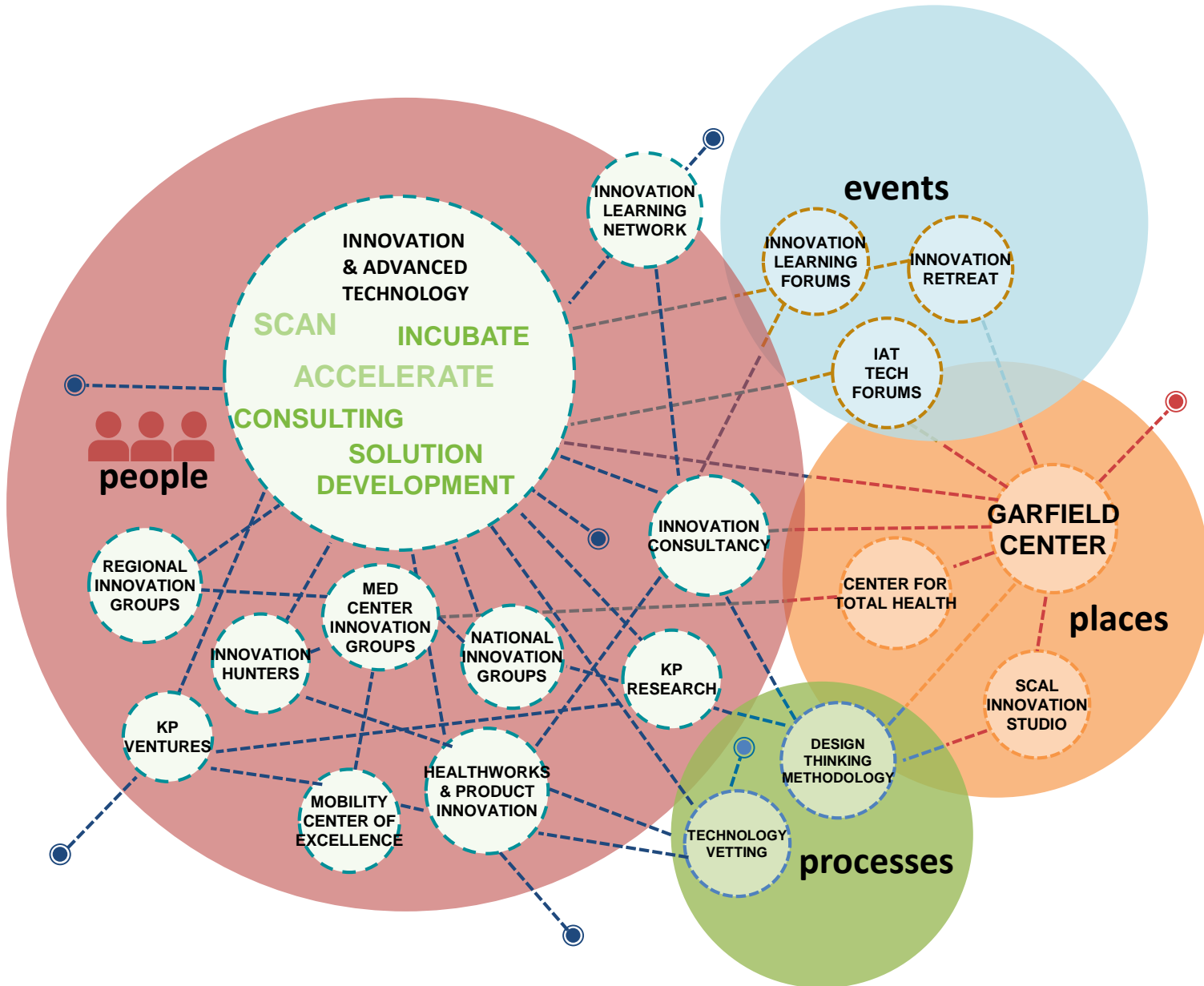
Digital health represents a convergence of capabilities that empower consumers to manage their health on their own terms, further redefining the patient/care giver relationship



# Emerging Technologies for Care Anywhere



# What is the KP Innovation Universe?



# Garfield Center Medical-Surgical Ward

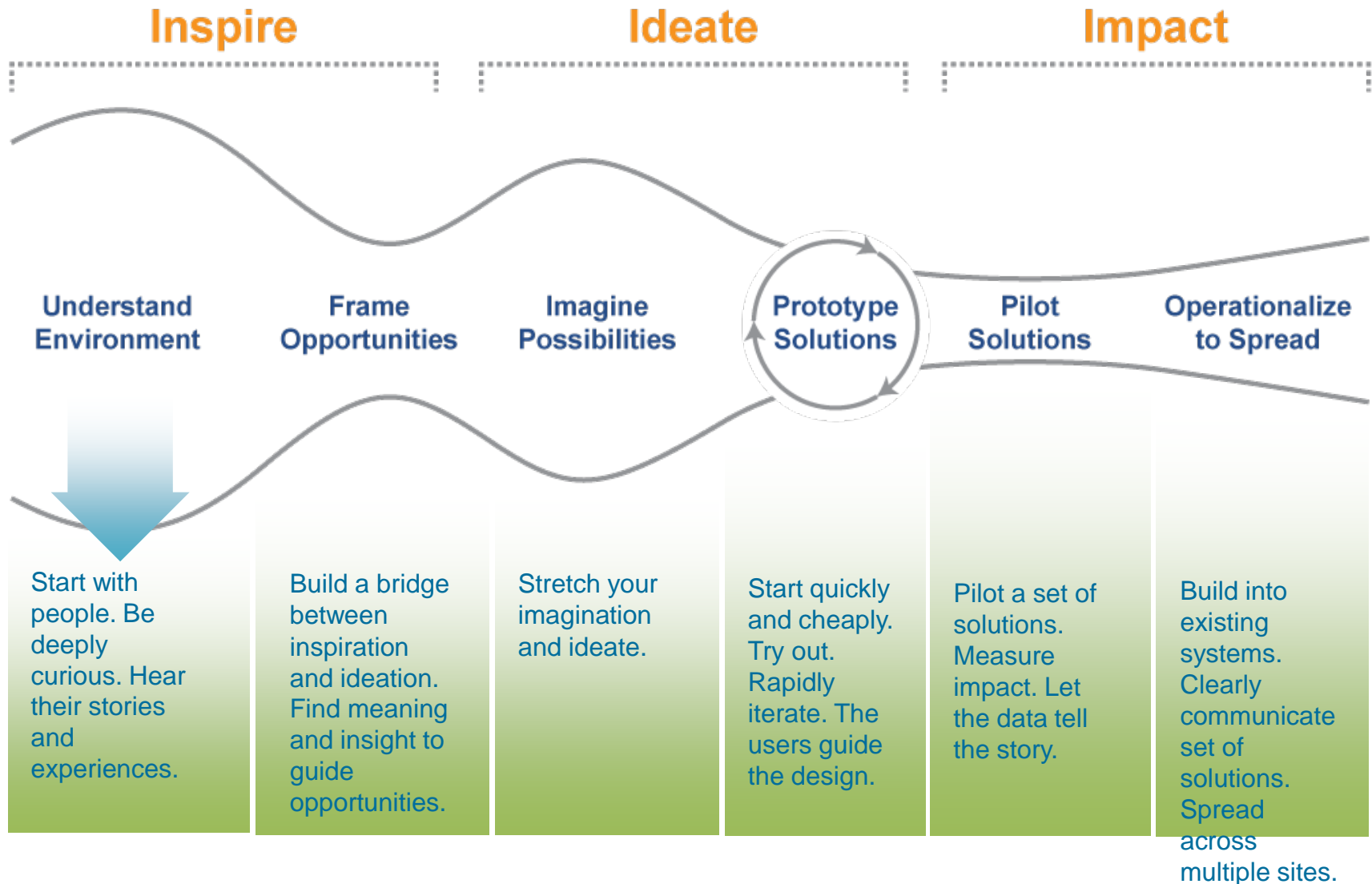


# Garfield Center Home Environment



# Our innovation process

A user-centered, hands-on approach to solving problems



# Sparking Conversations & Ideas



The Current Ecosystem of Innovative Tools

# **TOOLS THAT ENABLE CARE ANYWHERE**





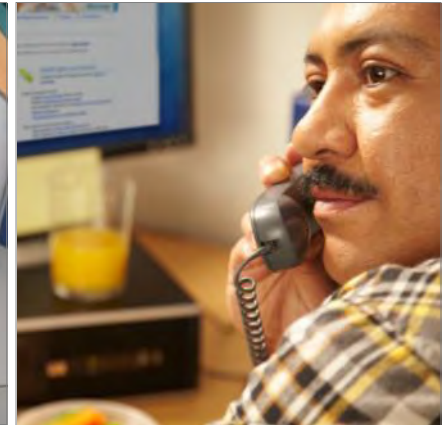
© Regenstrief



© Sony



© Getty Images



© Kaiser Permanente

## Live Video Consultation

Synchronous  
Saves travel time  
Improves access  
Convenient

**Everyone has to show up at the same time**



## Store & Forward

Asynchronous,  
send photo or video  
Saves travel time  
*and* more efficient  
Improves access  
Convenient

**Impersonal**



## Remote Monitoring

Monitor data  
Early intervention  
Saves travel time  
*and* more efficient  
Convenient

**Intrusive**  
**Requires engagement**



## Guided Self Service

Personalized education and guidance  
Social networks  
Automated rules-based supervision

**Requires engagement**



# Kiosks



© HealthSpot



© DynaTouch



© SoloHealth



© Phoenix Kiosk



Mobile clinic © Kaiser Permanente



# Smartphone, Tablet: 100,000+ Apps

1 **WellDoc**: Glucose monitoring app showing a reading of 65 mg/dl before lunch at 7:30/10:12:00 PM. Includes an attention alert: "This is a low BG. Glad you checked! Follow the 15-15 rule. Eat 15 grams of FAST-acting carbs. Re-check in 15 minutes."

2 **Baby Nursing**: Baby care app for William, 3 months 15 days. Shows nursing, diapering, and bath time logs with daily averages.

3 **Pillboxie**: Medication reminder app showing a Multivitamin reminder for 7:30 am.

4 **RunKeeper**: Running app showing a 25:14 run with 371 calories burned.

5 **MyCVS**: CVS pharmacy app with options for online refills, pharmacy, extra care, and more.

6 **Nike Training Club**: Workout app showing a 13:58 timer for a resistance band exercise.

7 **Dosecast**: Medication management app showing doses for Hydrocortisone, Lipitor, and Advair.

8 **KP member app**: Kaiser Permanente member app with sections for Messages, Appointments, Pharmacy, and Medical Records.

9 **HealthPrize**: Rewards app showing a scorecard, leaderboard, and various challenges like Fortune and PowerPill.

10 **Jawbone**: Fitness tracking app showing a 93% goal completion and 10,832 steps today.

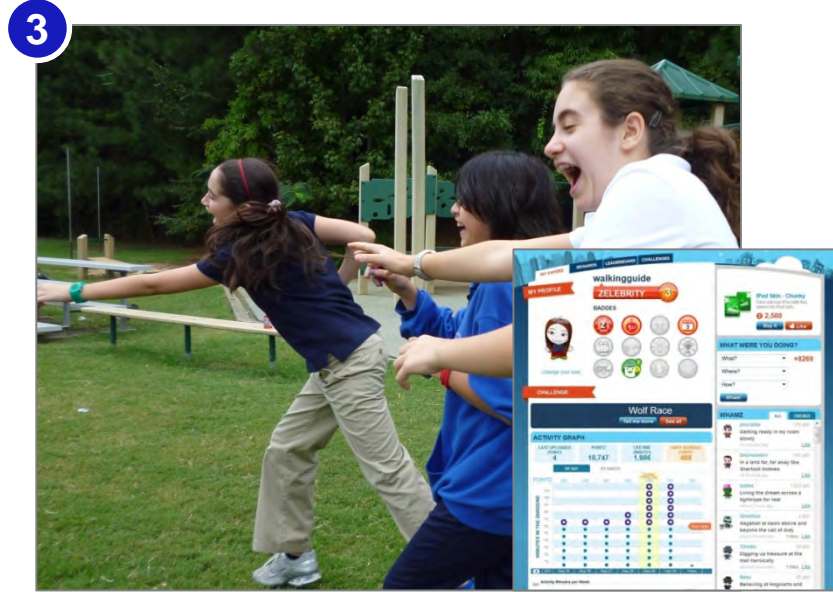
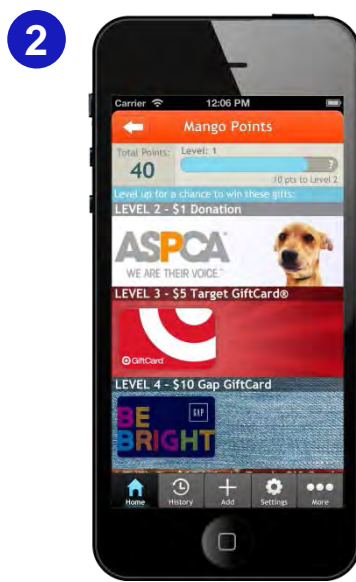
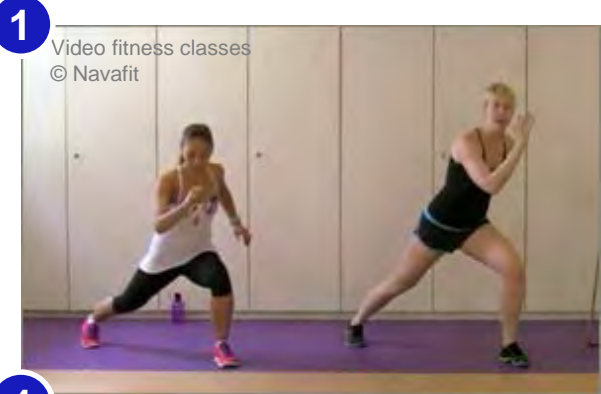
Nike Training Club

Dosecast KP member app

HealthPrize

Jawbone

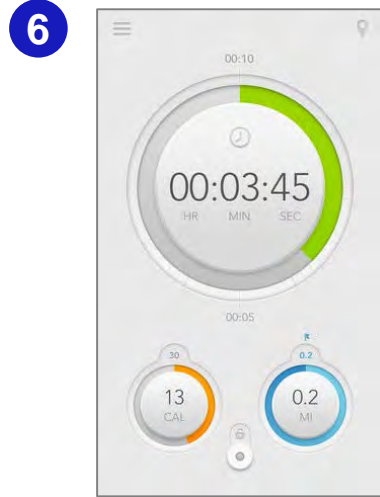
# Tracking Health



Fitness gaming © Mango Health

Team contests © Keas

Fitness gaming for kids © Zamzee / Hope Labs



Every Body Walk app © KP

VR fitness club © Club One Island

Sleep, diet, activity sensors and apps © Lark

# Total Health – KP Mobile Wellness Apps

**STAY ON TOP OF YOUR HEALTH.** Get personalized alerts about the care you and your family need to stay healthy.



### KP Mobile

Gives Kaiser Permanente health plan members the tools to locate facilities, access medical records, refill prescriptions, make appointments and send non-urgent messages to care providers from anywhere in the world.



### KP Preventive Care

Offers Northern California members personalized health reminders with convenience in mind. Get appointment reminders with one-click cancellation, screening tests and immunization reminders, and timely health tips.



### Every Body Walk!

This app enables you to personalize your walking plan, connect with walking communities, and learn about the latest fitness tips and trends.



### Hopp2IT

Empowers individuals to be healthier with the use of incentives and gamification. Includes a social media component to partner up with individuals and teams for “Healthy Opportunities” in a fun and easy way.



### Mix It Up

A simple online nutrition program that encourages users to eat more fruits and vegetables. There’s no calorie counting, no fat gram tabulating and no weighing or measuring.



### Thrive Across America

An online physical activity program where you travel from Maine to Hawaii, along a virtual route.

## PLASTIC TODAY



NUMBER OF DIFFERENT MEMBERSHIP CARDS PER REGION

**134**

# of different Kaiser Permanente membership cards issued

**3,472,619**

# of membership cards issued in 2012

**\$3,853,458**

Dollars spent in 2012 to issue cards

**38%**

Cards reissued per year

**\$1.11\***

Average cost per card

\*Cost of card includes production of card and mailing with one insert

## DIGITAL TOMORROW



### Membership Information and Identification

Access member, benefit, contact information and use as a form of identification at Kaiser Permanente



### Check-in and Check-out

Check-in/out for both in-person or virtual visits



### Payment

Pay for services with the Digital Membership Card



## Digital Membership Card

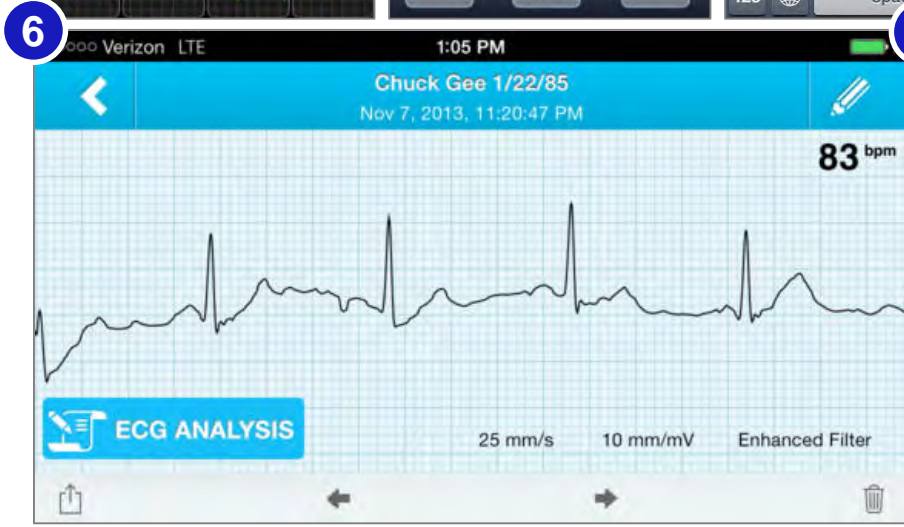
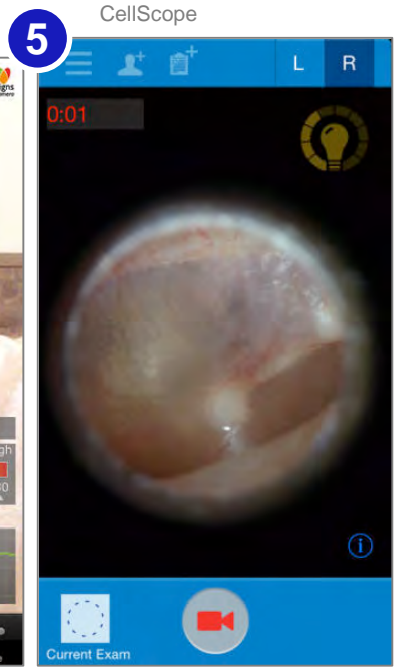
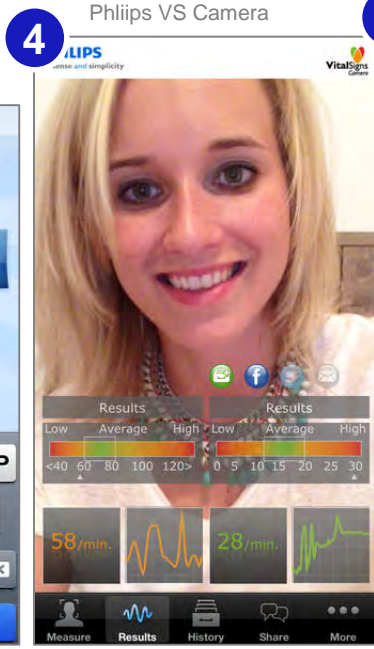
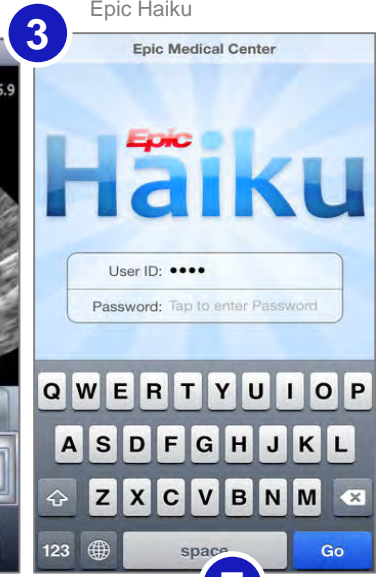
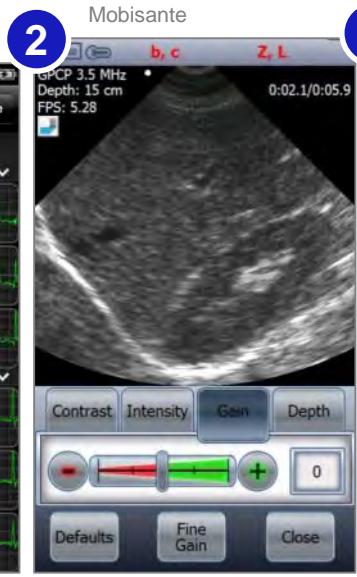
User taps symbol to view back of card

Digital Membership Icon

## Express Check-in and Payment



# Professional Apps



AliveCor

Mobile Stethoscope

# Fitness Trackers & Wearables

1



vivoFit – time, steps, distance, cals  
© Garmin

2



HR, motion, speed, time, cals, temp © Spree

3



Earbud sensor for VS, calories, speed, steps  
© Valencell

4



HR, speed, distance, GPS, altitude  
© Polar

5



HR, motion, skin temp, sweat  
© Basis

6



Spark – steps, cals, distance, time © Spark

7



Nike Plus Sensor – time, distance, pace, cals  
© Nike

10



Lift – posture alert © Lumo

8



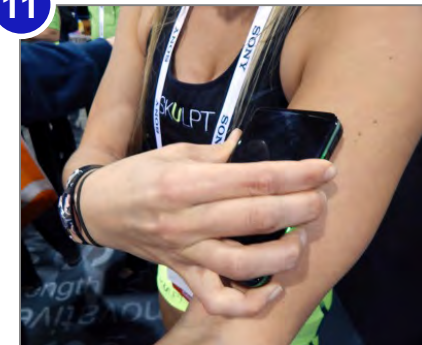
Orb – 3-axis accel, steps, sleep, cals  
© Fitbug

9



Reign – activity, cals, sleep  
© Jaybird

11



Aim – impedance myography © Skulpt



1



GPS tracker © Trax

2



Sensible Baby – temp, position, motion © Sensible Baby

3



Teddy the Guardian – HR, T, SpO<sub>2</sub> © ID Guardian

4



Fall predictor insole @ Veristride

5



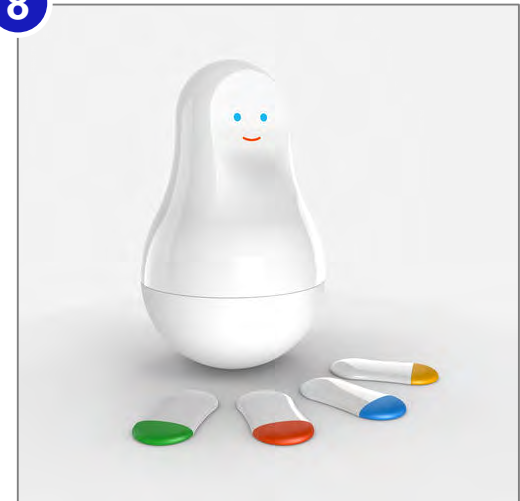
Pendant personal emergency response system © Philips Healthcare

7



Wireless activity sensor stickers © Green Goose

8



Wireless motion sensors © Sen.se Mother

6



Mimo jumpsuit – VS, position © Dragon Innovation

# Medication Reminders



Med reminder watch  
© Cadex



Pill dispenser  
© MedReady



Pill dispenser © Ivation



Multi-alarm © e-Pill



GlowCap pill bottle cap  
© Vitality



Medivox © BYTEC



Pillstation © Senticare



Automated pill dispenser © Philips

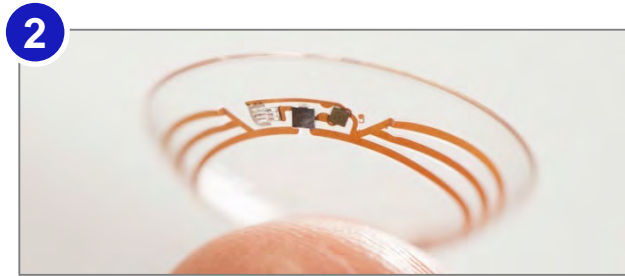


Automated pill dispenser  
© TabSafe

# Specialized Sensors



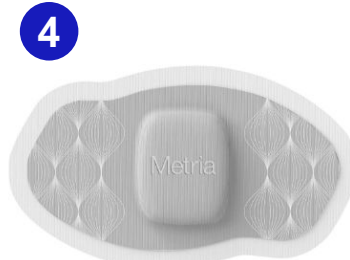
1 CheckLight – athletic head trauma cap © Reebok



2 Contact lens glucometer © Google



3 Mobile ECG © iHealth



4 Metria IH1 – accel, temp, GSR, disposable © Vancive



5 June – sun exposure sensor © Netatmo



6 Skin glucometer © Dexcom



7 Diabetic foot ulcer insole @ Orpyx



8 iSonic – sensor cane @ Primpo



9 Le Chal – shoes for the visually impaired © Ducere Technologies

- Proximity Sensor
- Directional Actuator/Vibration

Le Chal – shoes for the visually impaired © Ducere Technologies

## 1 e-Celsius thermometer pill



E-Celsius – wireless ambulatory temperature  
© BodyCap

## 2 MagneTrace necklace



Magnet pill © MagneTrace

## 3 Proteus Raisin microchip pill



Electronic pill © Proteus

## 4 Xhale SMART tracer system



Tracer-coated pill © Xhale

# Implantable Sensors



Wireless drug dispensing implant © MicroCHIPS



MIT bio-electronic ocular implant © engadget



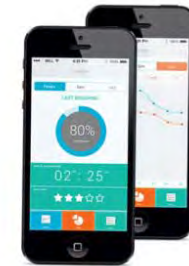
Artificial pancreas © J&J



Cochlear implant © Univ. of Michigan



Human tracking chip © Wireless



# Communicators

1



Time, SMS, email, GPS @ Pebble

3



Hi-Call – BT glove @ Hi-Fun

2



Time, SMS, email @ Meta

4



TrueSmart – Android smartphone @ Omate

5



Time, SMS, email, GPS @ Siemens

6



Linx – world's smallest hearing aid, Apple Mfi-compliant @ ReSound

7



Pine – detachable wrist smartphone @ Neptune

# Sensing Interfaces

1

Kinect in surgery © GestSure



2

Nintendo Wii © Nintendo



Wii casualty

3



Digits hand controller © Microsoft

4



Tobii – eye gaze tracking © engadget

5



Multi-touch surface table © NUITEQ

6



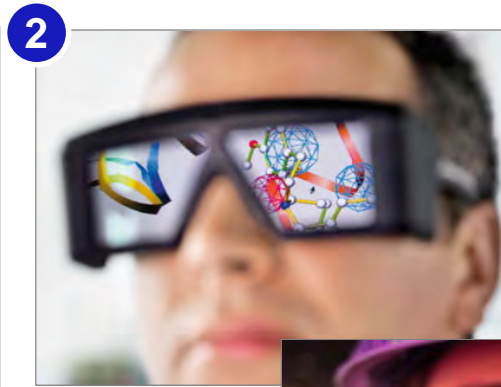
Electrical signal speech recognition © NASA



# Monitoring in Cyberspace: AR, VR



Vuzix iWear © gizmag



Molecular drug modeling © Roche



HC1 – AR headset © Motorola



Opto-acoustic noise reduction © VocalZoom



Google Glass © Google

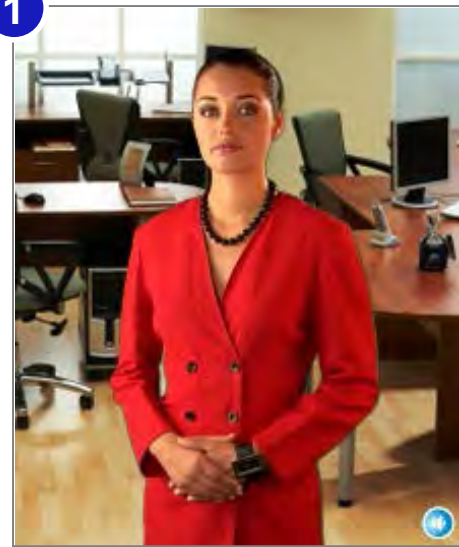


VR phobia therapy © PanSci.tw



VR multi-user simulation training © Forterra

# Robots



Autom – weight loss coach  
© Intuitive Automata



Paro – interactive baby harp seal



Legally blind driver in self-driving car © Google

Virtual assistant  
© InteliWISE

Telepresence robots



Phantom 2 Vision quadcopter © DJI



© iRobot



© Kubi



© VGo

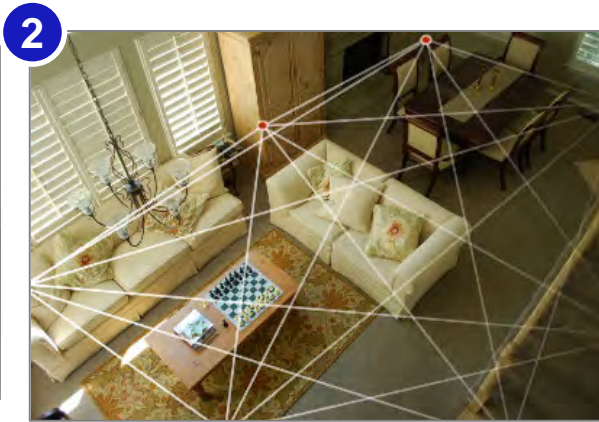


HD projector, audio, app-driven, room temp, CO<sub>2</sub>, etc. © Keecker

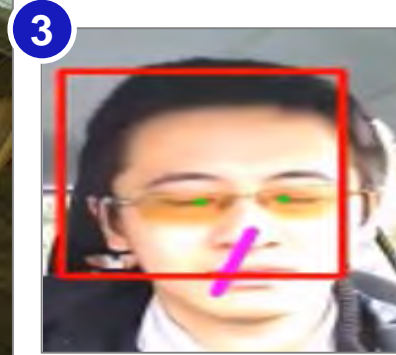
# Environmental Monitoring



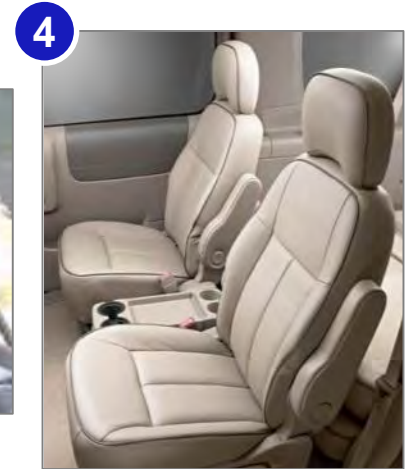
1 VS sensing at a distance © Kai Medical



2 Radio nodes for movement tracking © Xandem



3 CarSafe - drowsiness app © Dartmouth



4 Buttocks ID - Adv. Inst. of Industrial Tech (Japan)



5 Under-mattress activity and VS sensing © EarlySense



6 LG - interactive mirror display © TechnoBuffalo



7 Real-time location system - RFID, Wi-Fi, ultrasound © Red Cell Innovation



# Questions?