BLE, ZigBee + Wi-Fi technologies enable connected, personal healthcare

Part three of In-Stat and TI's 2010 wireless webinar series
December 2, 2010

Moderated by Jim McGregor, In-Stat

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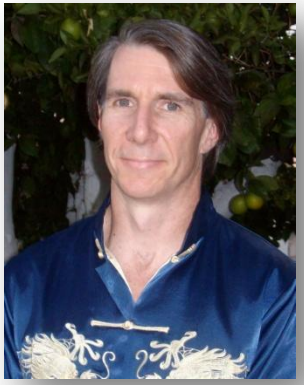
Welcome to our 2010 webinar series!

Today's agenda:

- 5-minute market overview
- 35-minute discussion by panelists
- 20-minute live Q&A

Today's host:

Jim McGregor
Chief Technology Strategist
In-Stat



Webinar archives available: www.ti.com/wirelesspresentations and www.instat.com

Today's panelists:

Leo Estevez
Technology strategist,
Wireless business unit, TI

Chuck Parker
Executive Director
Continua Health Alliance

Eric Rock
Founder/CEO
Intuitive Health

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Top-line overview

- **Introduction (Jim)**
- **The use of standards and industry guidelines (Chuck)**
- **The user experience and software platform (Eric)**
- **Technical capabilities and usability aspects (Leo)**

Introduction

Jim McGregor, In-Stat

Promise of technology

Increase the quality of medical care

Battle rising costs of care and medication through reduced waste and increased efficiency

Provide for the needs of changing populations

Unlimited applications

- Patient monitoring
- Resource tracking
- Information and records
- Medication dispensing
- Remote care

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Every environment

Professional

Home

Remote/Active

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Convergence & leveraging technologies

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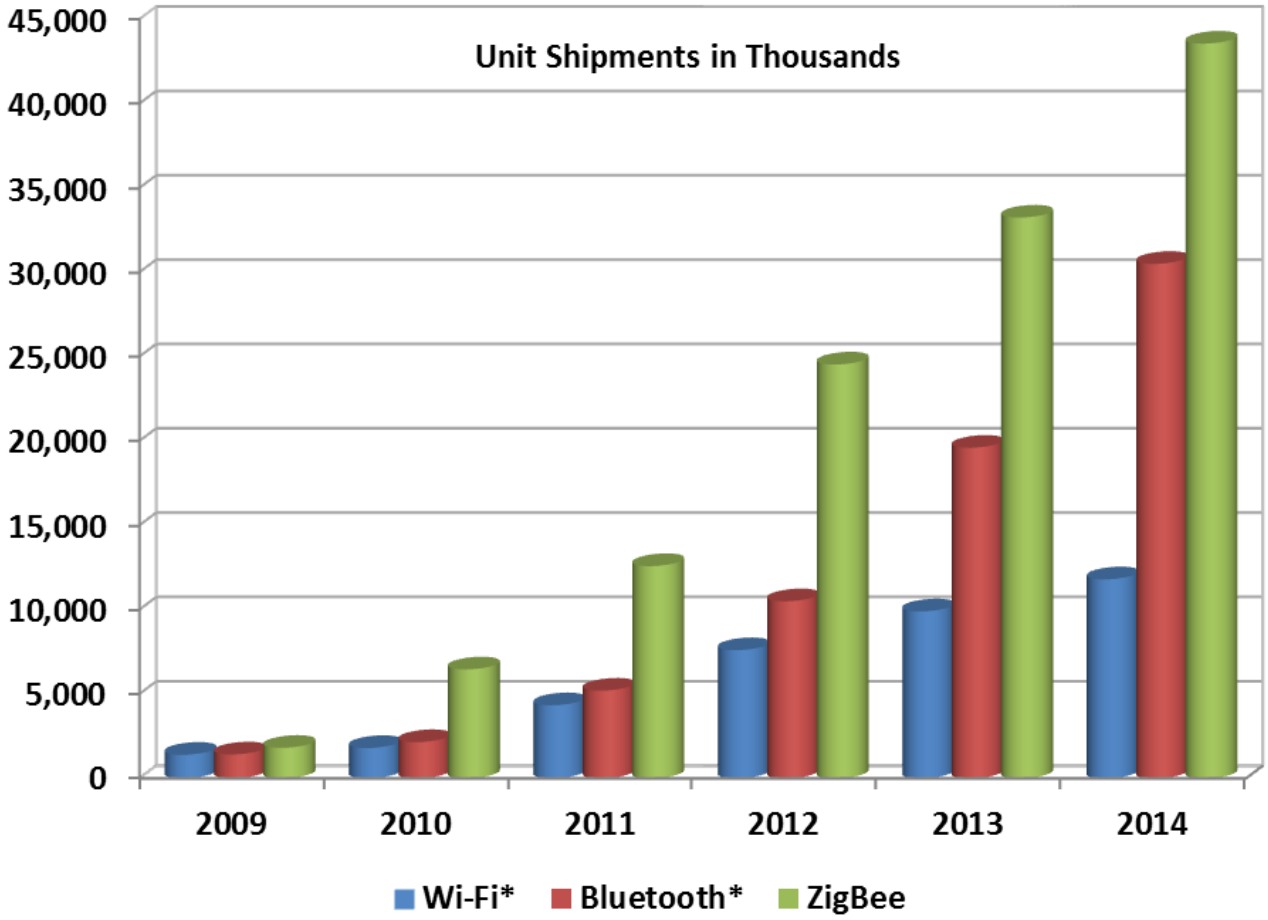
Enabling wireless technologies

Wireless Technology	Version	Frequencies	Max Data Rate	Range*	Network Application	Max Power Permitted	Focus	Typical Applications
Wi-Fi	802.11a	5.0 GHz	54 Mbps	30m	WLAN	-	Data rates	Home Networking
	802.11b	2.4 GHz	11 Mbps	30m				
	802.11g	2.4 GHz	54 Mbps	30m				
	802.11n	2.4/5.0 GHz	200 Mbps	50m				
	Wi-Fi Direct	2.4/5.0 GHz	250 Mbps	-	WPAN	-	Peer-to-peer/ wire replacement	Consumer electronics (peer-to-peer)
ZigBee	802.15.4	868 MHz 915 MHz 2.4 GHz	20 Kbps 40 Kbps 250 Kbps	30m	WPAN	1W	Low cost Low power Low latency	Energy management Industrial control Consumer electronics
Bluetooth	Version 1.x	2.4GHz	1 Mbps	Class 1 - 100m Class 2 - 10m Class 3 - 1m	WPAN	Class 1 - 100 mW Class 2 - 2.5 mW Class 3 - 1 mW	Peer-to-peer/ wire replacement	Handsets PC Peripherals
	Version 2.x	2.4GHz	3 Mbps					
	Version 3.0	2.4GHz	24 Mbps					
	Bluetooth LE	2.4 GHz	1 Mbps	-		0.01-0.5 mW	Low power	Remote sensors

Source: In-Stat, 11/10

Source: In-Stat, 11/10

Enabling wireless technologies



*includes industrial applications
Source: In-Stat, 11/10

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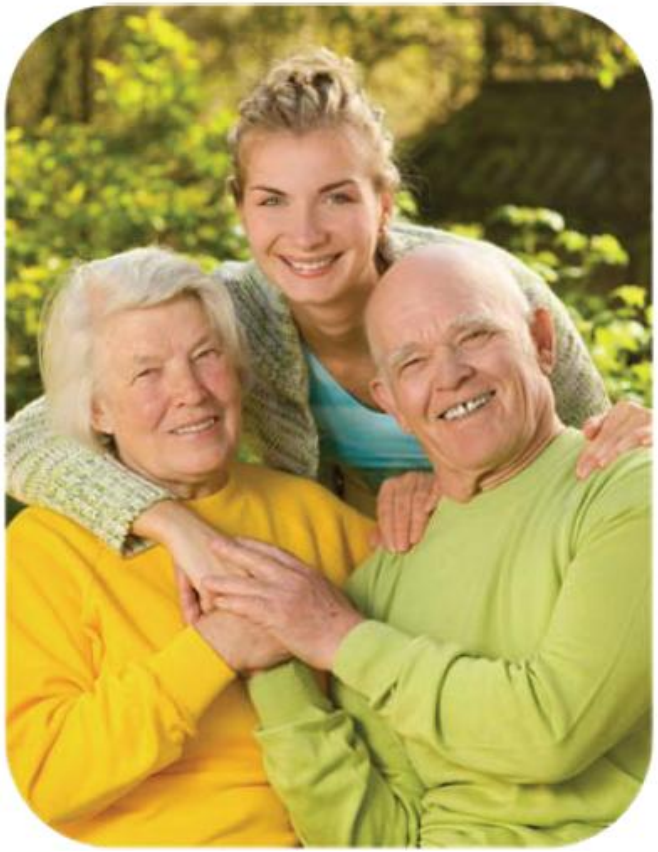
The use of standards, and industry guidelines

Chuck Parker, Continua Health Alliance

Continua Health Alliance: Our mission



"Our Mission is to establish an eco-system of interoperable personal health systems that empower people & organizations to better manage their health and wellness"

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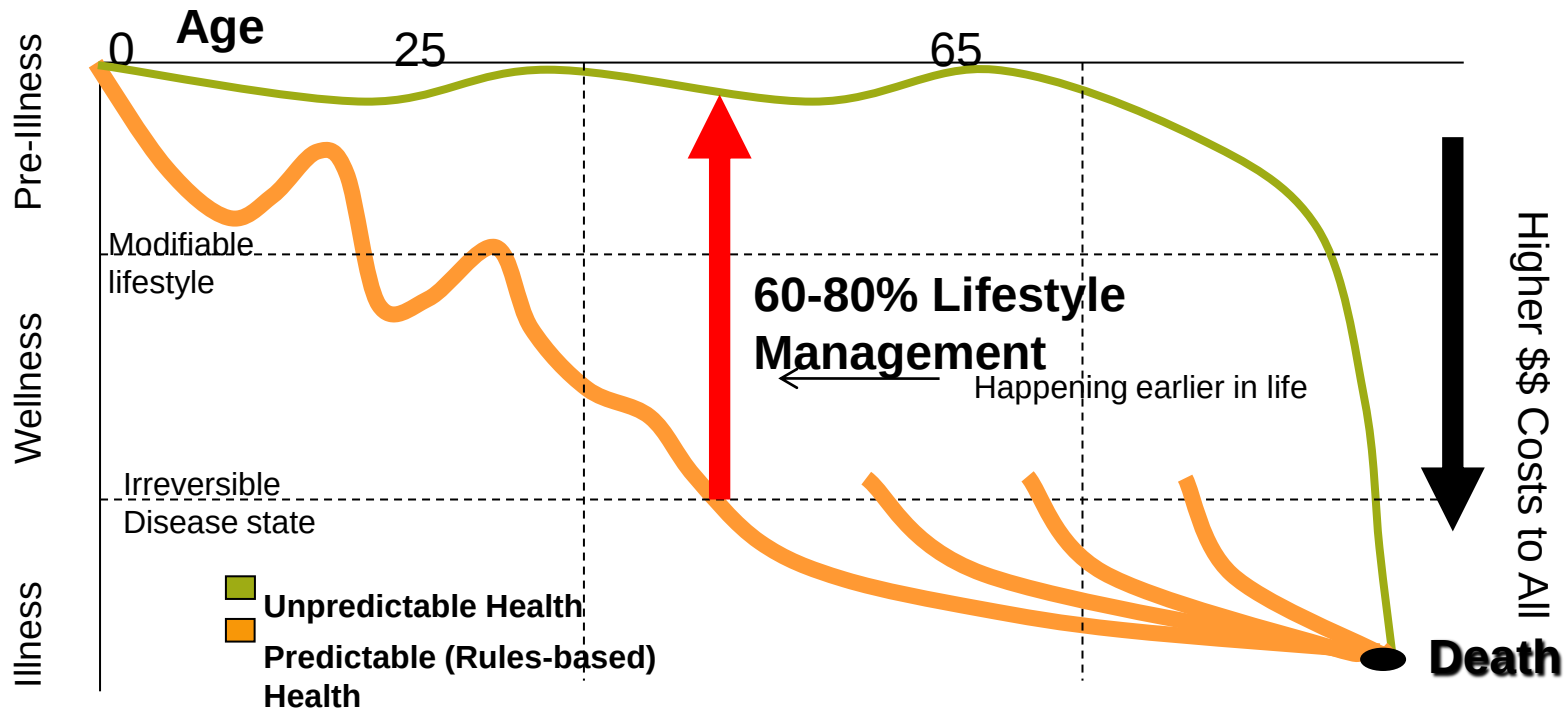
Keeping healthy

- Goal
  - Experience peak health potential throughout life for a high quality of life at minimal costs
- Reality
  - Average individual is experiencing much less of full health potential than expected at a high financial & quality of life cost
- Cause
  - Adverse health events such as stress, poor nutrition, and inactivity are causing the population to fall away from their peak health potential



Adapted from Oregon Medical Labs

Continua domains

- To organize its work, Continua segmented the market in three large domains:

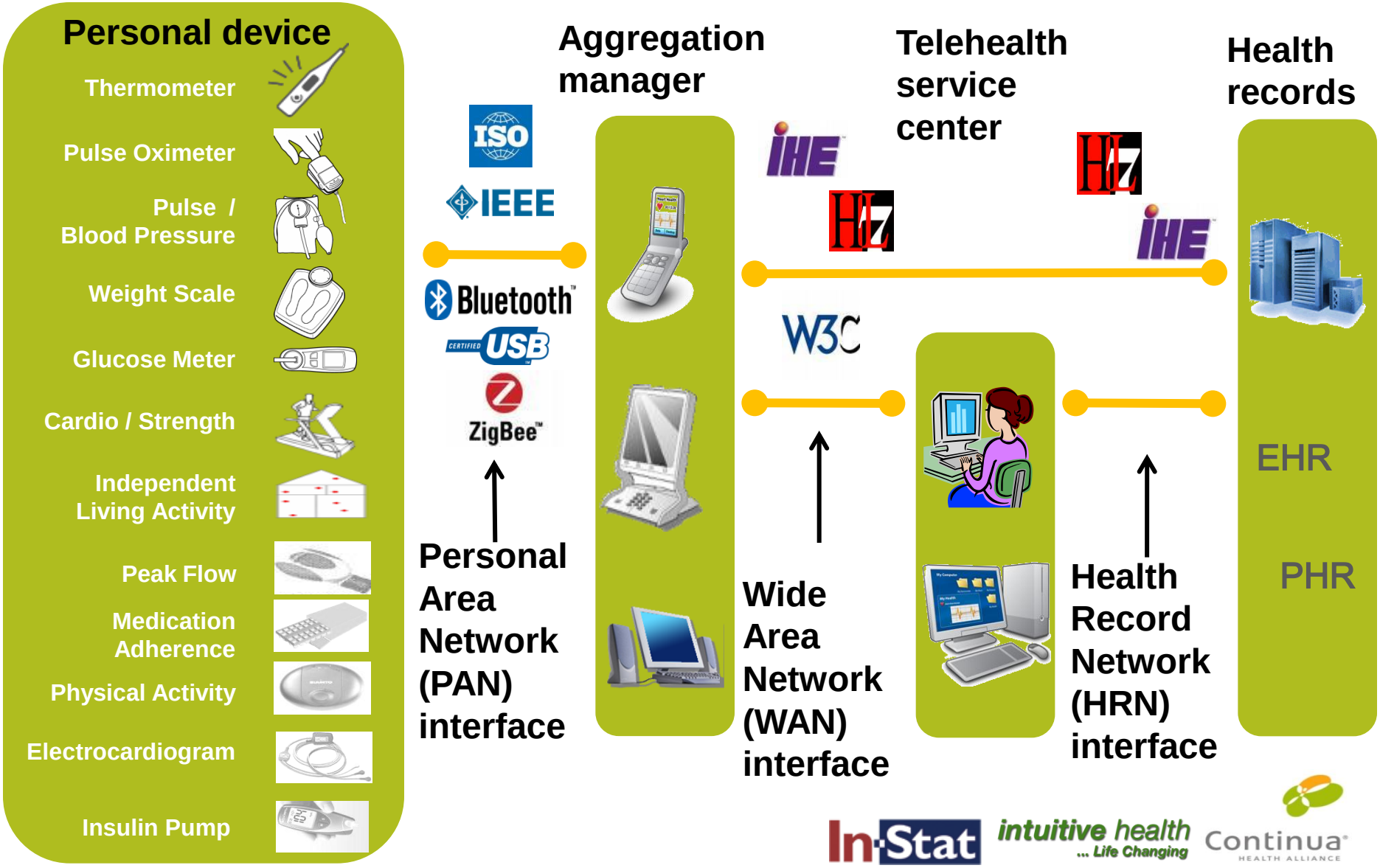
Aging independently
- An adult child helping their elderly parents age gracefully in their own home.
- Basic life monitoring as appropriate (ADL)

Health & wellness
- Weight loss
- Fitness
- Email / chat / video
- Appt scheduling
- Personal health records

Disease management
- Vital sign monitoring (RPM)
- Medication reminders and compliance
- Trend analysis and alerts
- Connect with family care givers

People are at the center of everything we do

Continua architecture



Ecosystem development

Developer Resources

- Web-based environment (repository, collaboration tools)
- Reference source code
- Bug tracking and open source modeling

Certification

- Free downloadable testing tools
- Right to use certified logo upon completion of successful certification
- Certification program for interoperability

Market Intelligence

- Access to market research data
- Access to pre-publication drafts of the design guidelines
- Internal and external education and training

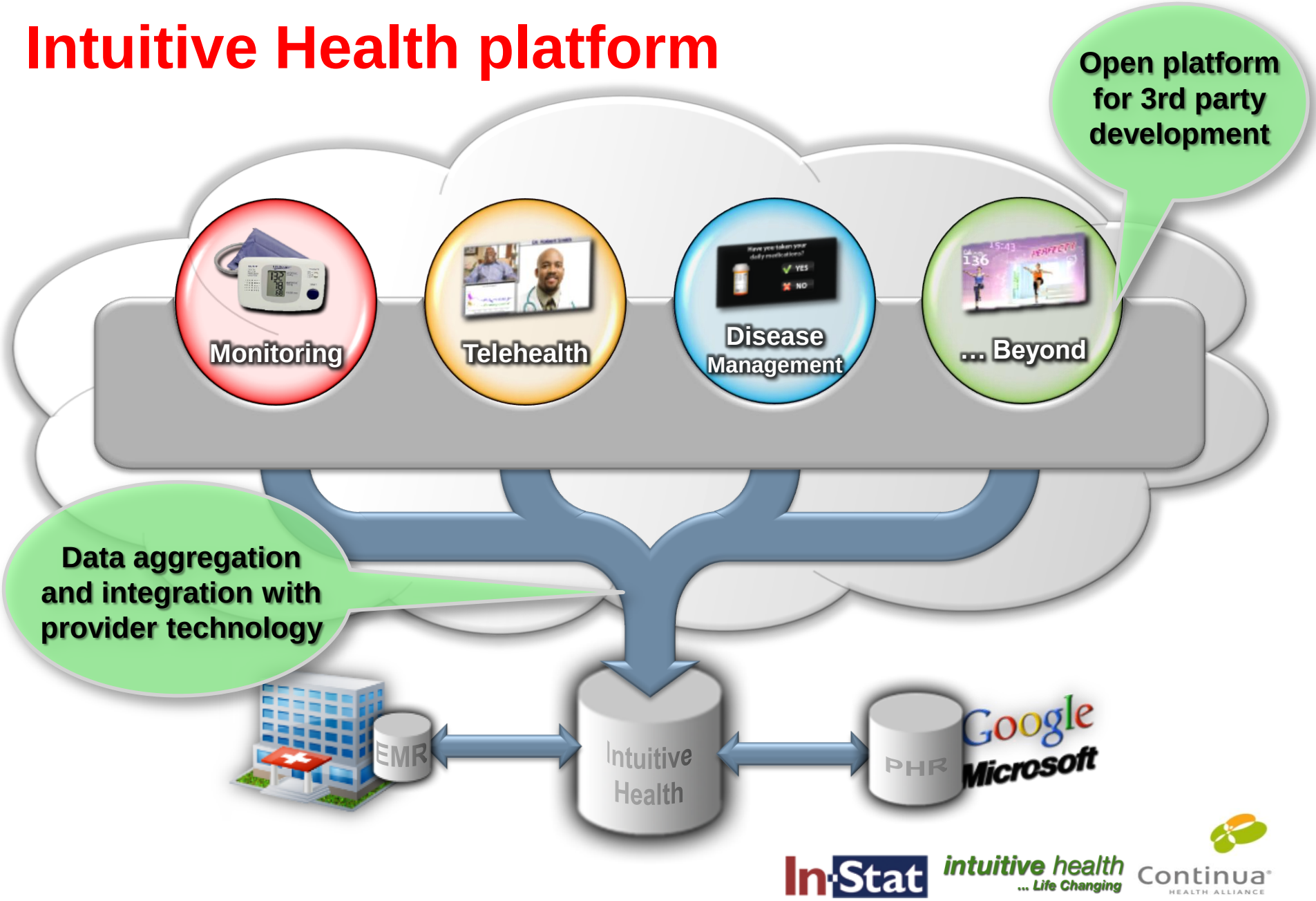
Collaboration

- Plugfests participation
- Participation in RFP MatchMaker program
- Unlimited participation in Continua quarterly summits, town hall meetings, and education seminars

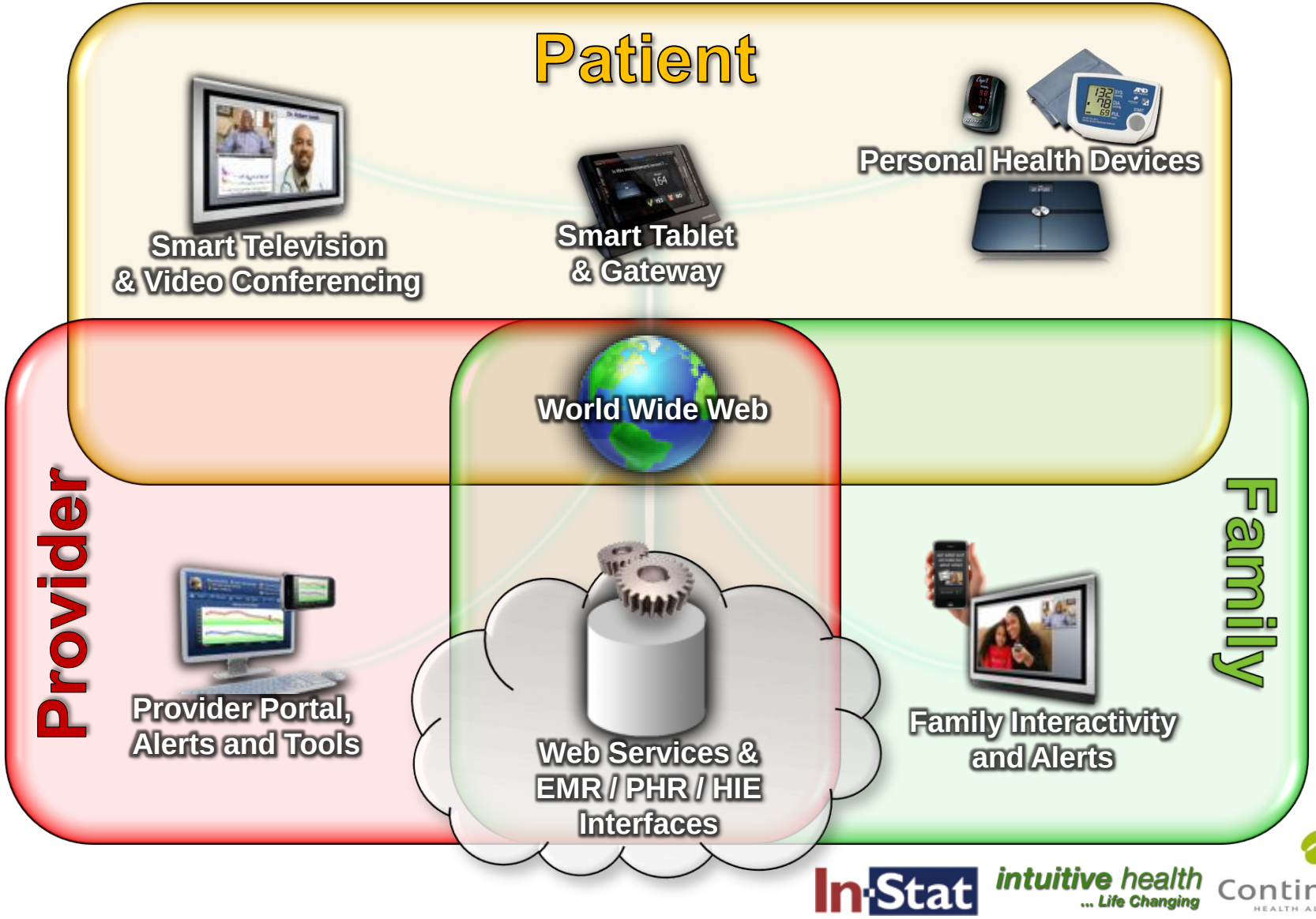
User experience and software platform

Eric Rock, Intuitive Health

Intuitive Health platform



Enabling accountable care



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Intuitive by design

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Wireless use cases

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Technical capabilities and usability aspects

Leo Estevez, TI

Wi-Fi personal health manager applications

- Connecting mobile & stationary personal health managers to an installed base of home access points:

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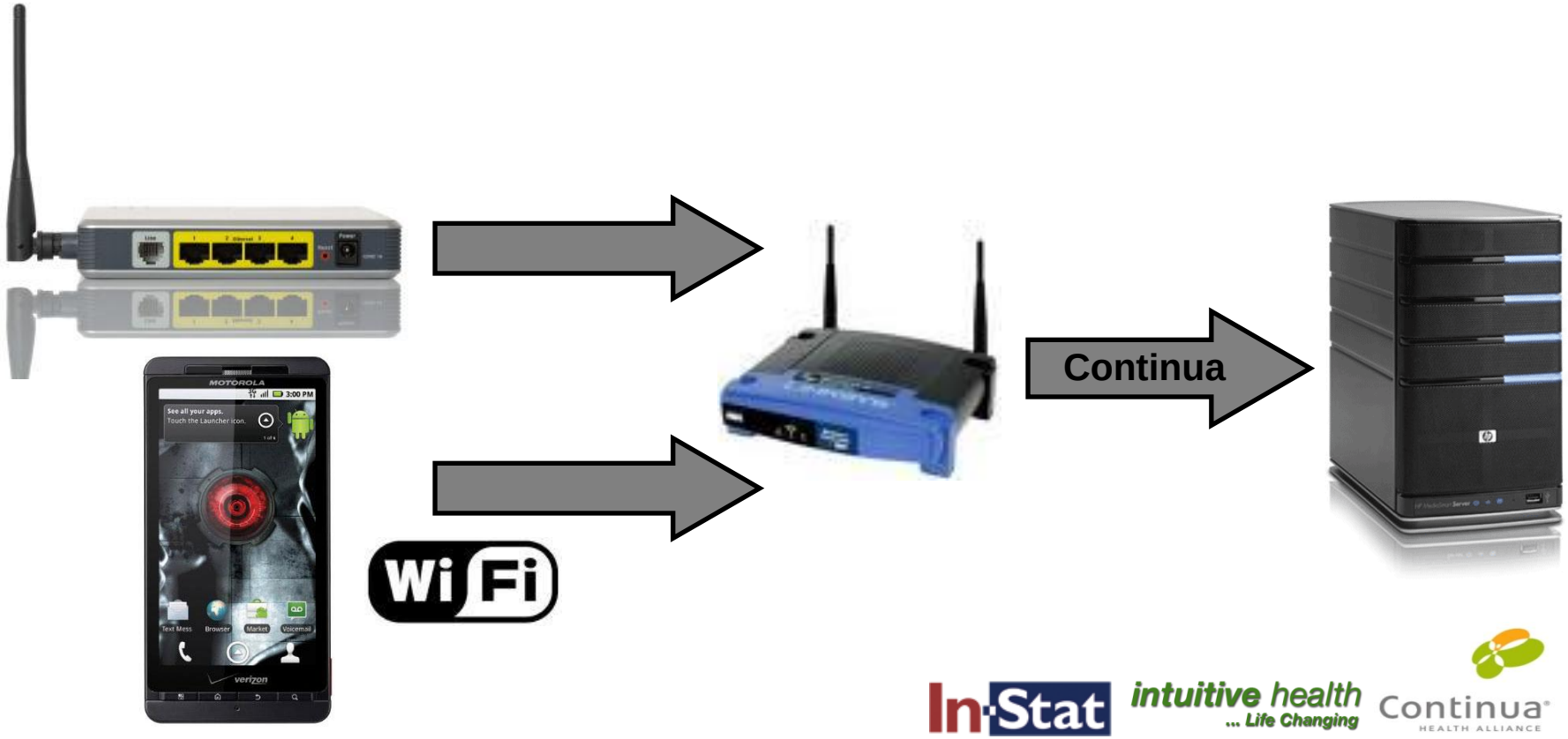
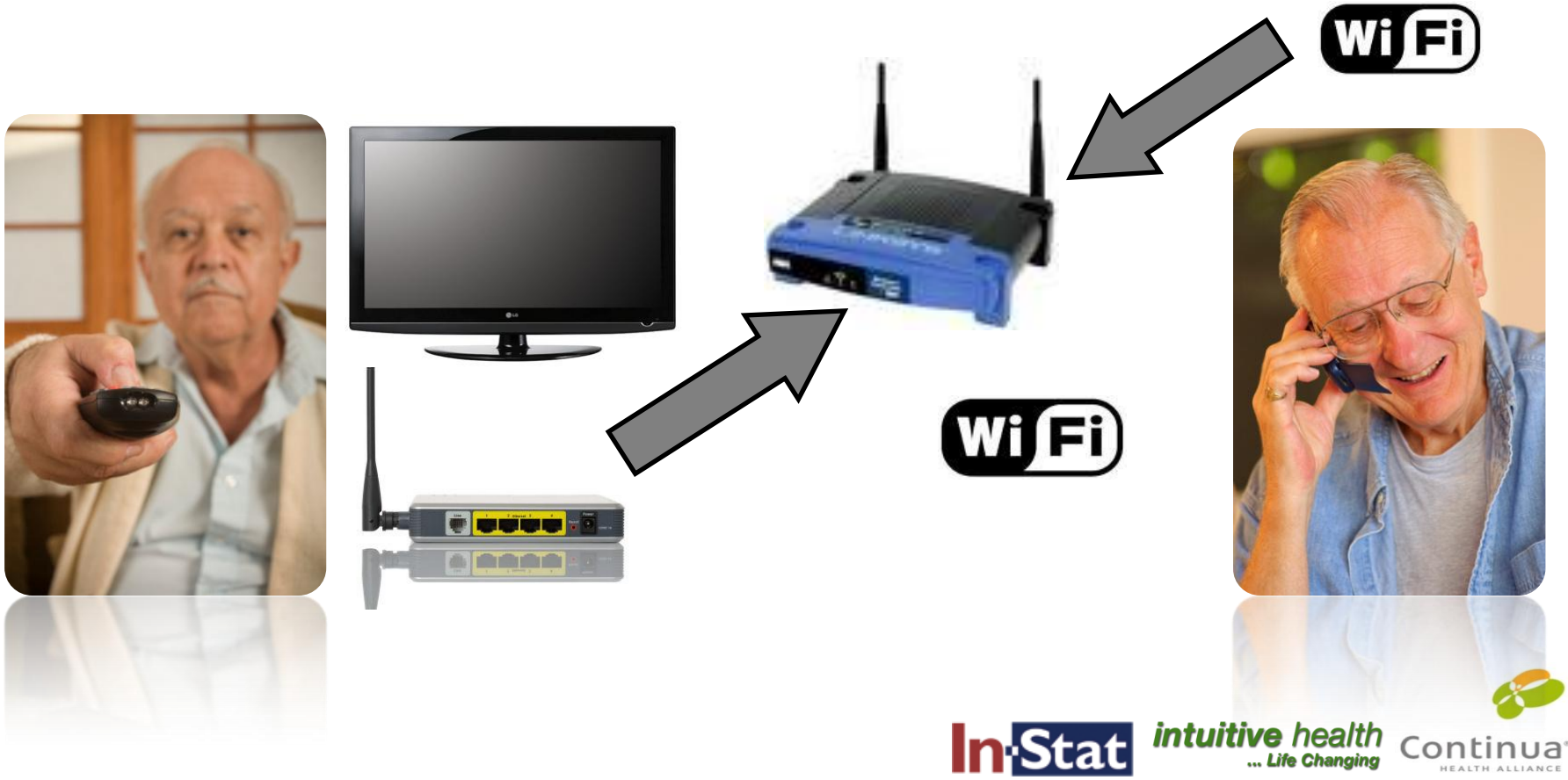
Personal health manager interoperability

- Interoperability between Wi-Fi-enabled managers and access points is addressed by the Wi-Fi Alliance
- Interoperability between IP-enabled managers and servers is addressed by the Continua Health Alliance



Personal health manager usability

- Usability of Wi-Fi-enabled personal health managers requires that vendors take into consideration problems consumers may encounter in both the setup and use of these devices



ZigBee/*Bluetooth*® Low Energy (BLE) personal health device applications

Medical alerts

ZigBee™

Aging Independently

Disease management

Health & fitness

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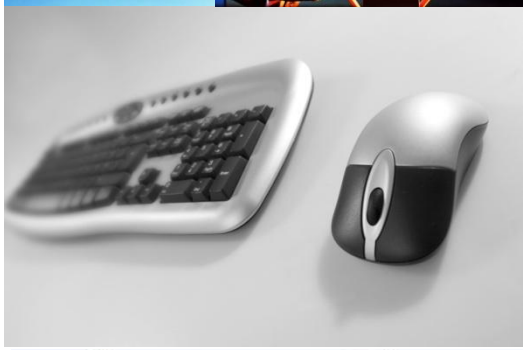
TI BLE solutions

- 2.4GHz, 1Mbps, GFSK
- Point-to-Point and Star Networks
- Single mode and dual mode devices
  - Dual Mode *(smart phones)*
    - Supports *Bluetooth* and BLE
  - Single Mode *(smart sensors)*
    - Supports BLE only
- Low cost, complete solutions like TI's CC2540 solution
- Wi-Fi integrated mobile and stationary manager support in TI's WiLink™ 6.0 (WL1271) solution
- Ultra low power by:
  - Quick connection times
  - Low power synchronization
  - Low peak power
- <1/10th of *Bluetooth* power(low duty cycle)



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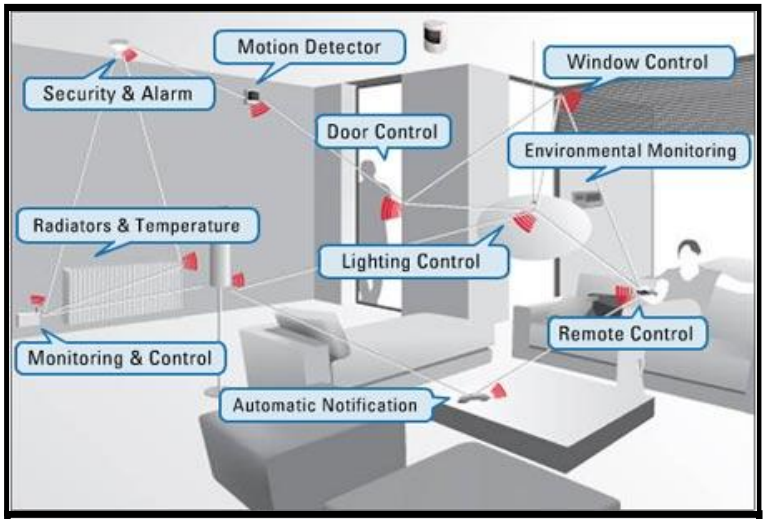
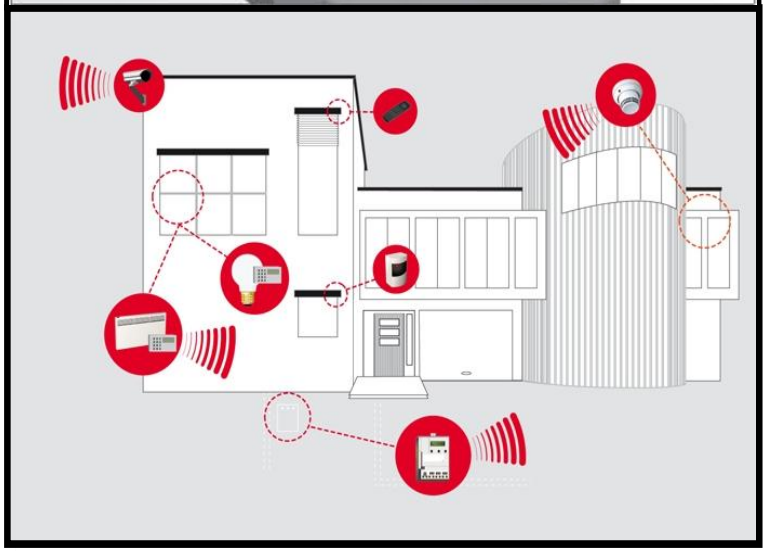
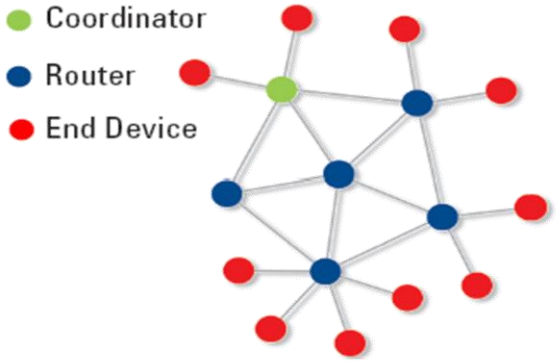
TI ZigBee solutions

- Fully integrated solutions like TI's CC2530 solution
- 2.4GHz, 250kbps
- IEEE 802.15.4 PHY/MAC
- Mesh networking
  - Self healing
- TI's total solutions include:
  - Transceivers, WNPs and SoCs
  - SW and development tools
  - Simple, reliable, low cost, and low-power
- Driving applications
  - Ageing independently
  - Monitoring & tracking







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Personal health device interoperability & usability

- Continua addresses ZigBee and BLE interoperability in cooperation with ZigBee Alliance, the BT SIG, And IEEE 11073
- TI provides fully interoperable Continua solutions which also protect against wireless interference between these three wireless technologies

ZigBee™ Wi Fi

Co-existant

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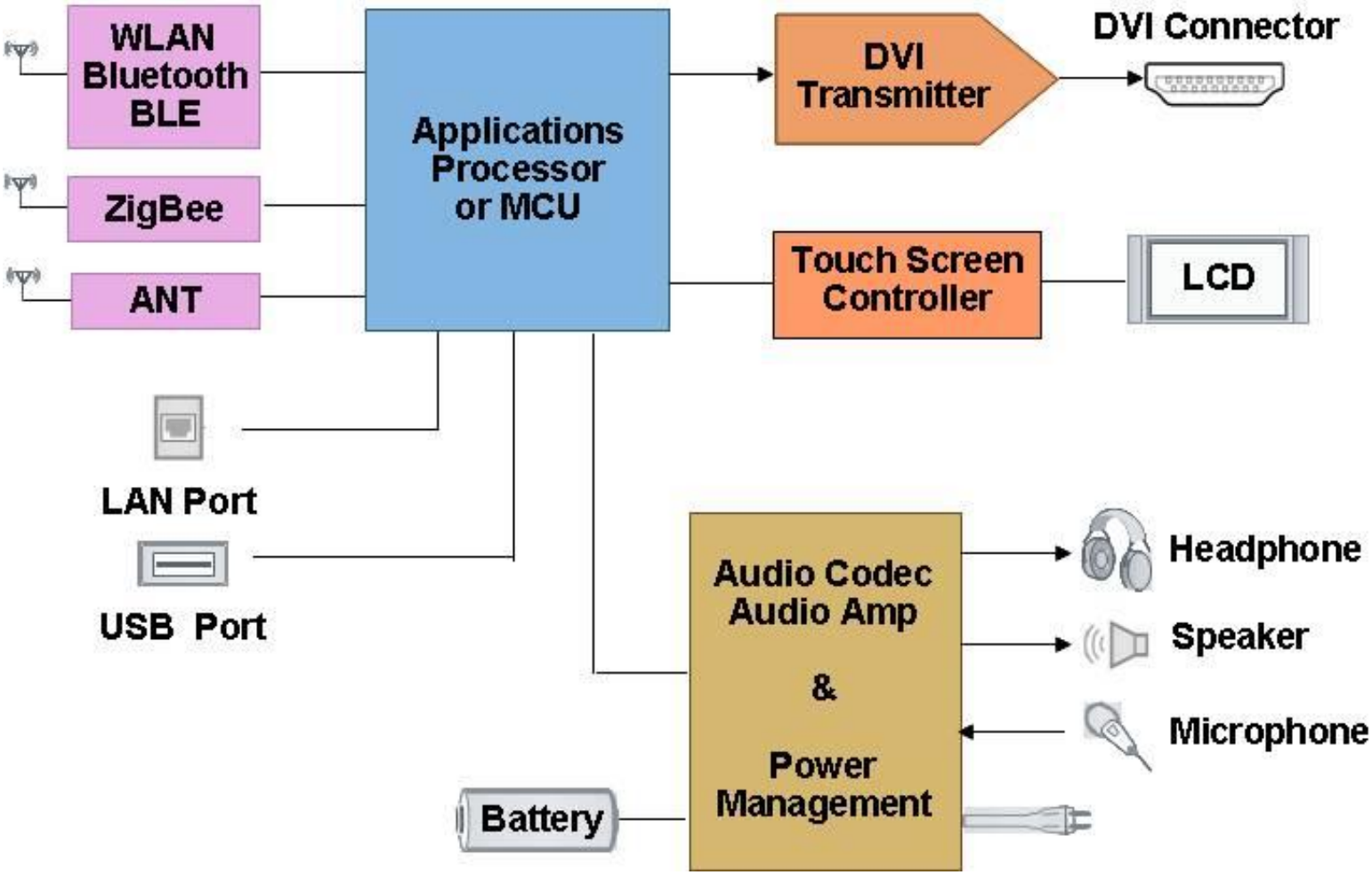
TI personal health manager solutions



Summary

- Potential benefits
  - Increased quality of healthcare
  - Reduced costs
  - Higher quality of life
- Improving healthcare through technology requires
  - Utilizing all available technology (TI)
  - Standards (Continua)
  - Platform Solutions (Intuitive Health)

Q & A

- To participate, click on the Ask a Question link on the left side of the interface; enter your question in the box on the screen; hit “Submit.” We’ll answer them during the Q&A session or after the webcast.

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