


PHRC Webinar Series I Tuesday December 8<sup>th</sup>, 2015 @ 1:00 PM

## Technology in the Connected Home

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## Course Description

- A “Smart Home” or “Connected Home” refers to a home that has particular objects, products, controls, and systems that are interconnected and identifiable through a series of digital networks. These networks provide home owners with comfort, security, energy efficiency, reduced operating costs, and convenience at all times, regardless of whether anyone is home. Particularly, these residences have appliances, lighting, heating, air conditioning, TVs, computers, entertainment audio & video systems, security, and camera systems that are capable of communicating with one another and can be controlled remotely by a time schedule, from any room in the home, as well as remotely from any location in the world by phone or internet. This webinar aims to provide participants with the information and personal guidance they may need to understand appropriate “smart home” products and technologies, taking into consideration budget, occupant needs, and desired client outcomes.



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## Learning Objectives

- **Following the completion of this webinar, participants will be able to:**
  - Recognize opportunities to incorporate new simple, affordable, fashionable, and reliable technologies in their homes that will allow ease of use, enhance occupant safety, promote cost-savings, and support energy efficiency.
  - Describe ways that a “connected home” can help reduce healthcare costs of the occupant(s), while satisfying the general desire to remain in their own home as they age.
  - Identify the six categories of monitoring and assistance technology features that each “Smart Home” technologies will fall into.
  - Understand ways to control individual lights, shades, thermostats, and to monitor occupant behavior, while away from home.



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## Agenda

- ❖ **Background**
  - ❖ Topic Overview
- ❖ **Benefits of a Connected Home**
  - ❖ What can it provide?
- ❖ **Designing a Connected Home**
  - ❖ When?
- ❖ **Connected Home Solutions**
  - ❖ What to expect
- ❖ **Summary & Questions**

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## Background

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## What is a Connected Home?

- **"Smart Home" or "Connected Home"**
  - The term used to define a residence that has appliances, lighting, heating, air conditioning, TVs, computers, entertainment audio & video systems, security, and camera systems that are capable of communicating with one another and can be controlled remotely by a time schedule, from any room in the home, as well as remotely from any location in the world by phone or internet.
  - Installation of "smart" and "connected" products gives the home and its occupants various benefits
    - Convenience
    - Savings of time
    - Savings of money
    - Energy efficiency

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## Why a Connected Home?

- **“Connected” or “Smart” Homes are applicable in numerous aspects of our home and environment to suite our different personal preferences**
- **Objectives of the connected home include:**
  - Comfort or ease of control
  - Entertainment
  - Security
  - Convenience at all times
  - Lifestyle personalization
  - User friendly
  - Reducing consumption costs

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## Technology vs Connected

- **“Smart technology” vs. “the connected home”**
  - What is the difference?
- **The advantage:**
  - Automatic pairing/connection of technologies
    - Centralizes control of residence’s HVAC, lighting, appliances, other systems
    - Connects the home to devices that allow communication with each other
    - Connects wirelessly
  - Simple interface
    - Smartphone, tablet, computer, control screen
    - Voice - Siri (Apple)
  - Secure connections
    - For all devices

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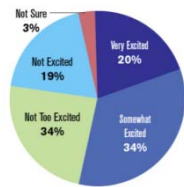
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## The Future Is Now

- **North America is the largest consumer of home automation products**
  - Due to construction & renovation market increases
  - Consumers’ interest in convenience, connectivity, safety, security, efficiency, and green solutions
- **The North American market recorded a 70 percent year-on-year growth in 2014 in the installed base of smart homes**
  - 28 percent of all households by 2019 will be “connected homes”
- **Major companies already involved in the connected home market**
  - Apple
  - Google
  - Amazon

United States:  
Excitement about the possibility of incorporating smart home feature in the home



Source: Control Stack On The Smart Home (2014)

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# Overview

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- ## Connected Homes
- **Connected home features:**
    - Home Energy Management Systems
    - Personal alarms to a response center
      - Pendants and pull cords
    - Video door entry systems
      - Allow the resident to see who is visiting
      - Open the door remotely
    - Bed and chair occupancy sensors
      - Provide warnings if the resident does not return in determined time
    - Lighting that can be automatically activated
      - A resident gets out of bed – lights illuminate automatically
    - Automatic window and curtain controls
    - Medical monitoring that can be assessed on site and information forwarded appropriately
      - Pulse, blood pressure and heart rate
    - Increased use of robotics to assist around the house
      - Assists those with mobility restrictions
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## Expectations of technology - Vehicle vs Home

- Navigation Systems
- Power windows
- Power locks
- Alarm system
- Bluetooth phone
- Bluetooth media
- Backup camera
- Cruise control
- Automatic doors
- Warning sensors
- Control screens

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## Market Forecast

**Figure 35. Smart home revenue forecast, global, 2012–2017**

Smart home revenue (\$ billions)

Year	Smart home hardware (\$ billions)	Smart home services and installation fees (\$ billions)	Total (\$ billions)	YOY Growth (%)
2012	13.7	8.1	21.8	+21.8%
2017	41.3	30.5	71.8	+71.8%

CAGR: 27%

Source: *Smart home revenues forecast to reach USD 72 bln by 2017*, Telecompaper, January 8, 2013; Deloitte analysis.

Graphic: Deloitte University Press | DUPress.com

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## Homes with Smart Home Technology

- The North American market recorded a 70 percent year-on-year growth in 2014 of smart homes
  - 7.9 million at the end of the 2014
    - 6% of all households
  - 38.2 million by 2019
    - 28 percent of all households by 2019 will be “connected homes”
- This trend will allow a larger number of consumers to experience the benefits of connected home technology at an earlier stage
  - Will solidify the development of the connected home market

Total number of smart homes (Europe and North America 2013–2019)

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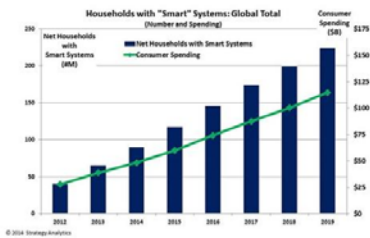
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## A Look Forward

Global Smart Home Market will reach \$100 Billion by 2018



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## Connected Homes

- **The connected home market is on the upswing**
  - An estimated spent \$17.9 billion on smart home systems in 2014
  - The global smart home market is expected to realize revenues of \$100 billion by 2018
- **Consumers have become more educated about the possibilities of a smart home**
  - The more people know about this technology, the more interested and excited they become about incorporating it into their everyday connected lifestyles

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## Benefits of a Connected Home

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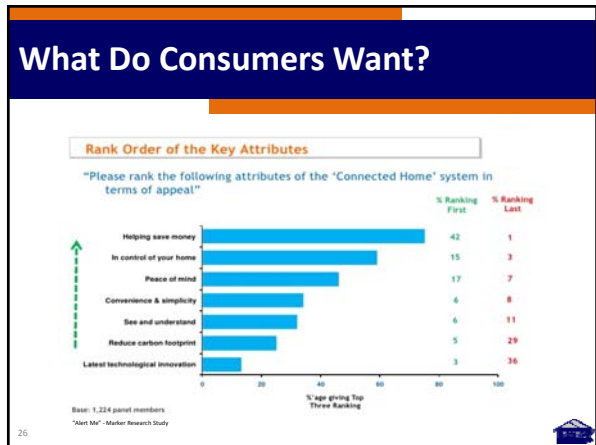
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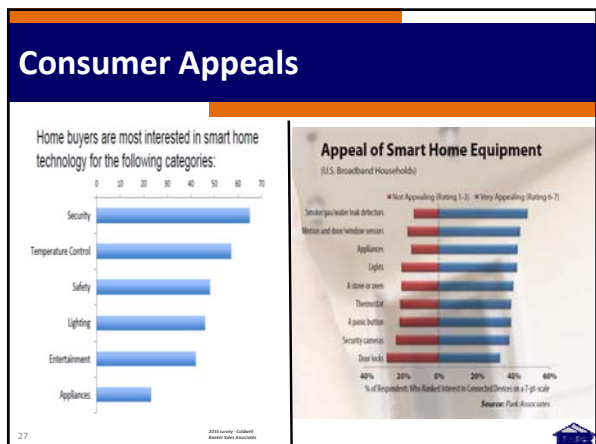
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## Cost Savings

- **Smart/connected homes can increase savings**
  - Utilizing home controllers integrated with all home sub-systems to increase savings by controlling systems
    - Lighting
    - Window coverings
    - HVAC
    - Irrigation
    - Monitoring usage and consumption
  - Connected home controllers can have built-in monitoring systems whereby they calculate and log usage by all connected devices
  - Home owner gain awareness and knowledge to make necessary changes
    - Can even be accessed over the Internet from anywhere in the world
    - Homeowner can adjust consumption at any time from anywhere

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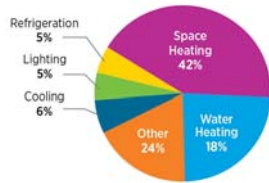
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## Energy Efficiency

- **A connected home is also a sustainable home**
- **An important feature of a smart home is conservation of the earth's resources**
  - Programmable devices
  - Learning devices
  - Integration of systems
  - Sensors
- **Reducing energy consumption will also reduce energy costs**



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## Energy Efficiency

- **Reduce heating & cooling your home when you are not there**
  - Climate control can also extend to turning on/off your gas fireplace.
- **Energy consumption monitoring**
  - Tell you where and when you are wasting energy
    - Allows for in home adjustments
- **Automated window coverings**
  - Security
  - Energy savings
    - Closed blinds keep the hot sun out
    - UV rays from damaging your floors, furniture and art
- **Lighting Control**
  - Preprogrammed lighting scenes
  - Motion sensors
    - Keep lights from being left on in empty rooms
    - Ambiance
  - Dimmers
    - Control bulb output & extend the life of your lightbulbs by up to 25%

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## Security

- **Interactive security systems**
  - Personal & family security remains “one of the top” (90%) reasons to purchase a smart home
  - 62% say security is the “primary driver” in purchasing connected home technology
- **What it includes:**
  - Video monitoring systems
    - Controlled motion sensitive cameras which allows for observation of activities
    - Capture and record video surveillance
  - Fire, Smoke and Carbon Monoxide detection when you are not home
    - Initiate emergency alarm and notify emergency services
    - Shut off your furnace to reduce burn rate and stop smoke from circulation through the HVAC
    - Automatic de-activation of electric systems and activate emergency lighting

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## Security

- **What it includes:**
  - Water leak detection
    - Shut off water main in event that your pipes burst
  - Controlled access, door lock, contact notifications
    - Informs user of visitor at the door
      - Owner can grant or deny access using mobile device
    - Keyless and mobile entry systems
      - Access using finger print, eye or face recognition
    - Allows homeowners to know when children come home
    - An occupant has left without properly locking doors
  - Other alerts
    - Low temperature alerts let you know when your heating system may not be properly functioning

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## Entertainment

- **Entertainment has also emerged as a new and powerful driver to smart home adoption**
  - Nearly half of consumers (46%) list the ability to remotely control and/or monitor their TV and sound systems as “one of the top” reasons to purchase a smart home system ...
- **Consumer motives**
  - Audio and video easy to control
    - Control & distribute music throughout your entire home
      - Streaming from your own devices
      - Access to internet content
    - Stream video from one central media player to any TV
    - Parental control feature on television channels
  - Digital Access
    - Access favorite CD's, DVD's from any music system and television around the home;
  - Digital Storage
    - System automatically stores most played music based on number of play.

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## Wellness

Connected homes can also offer benefits for the disabled and elderly persons in the various ways:

- **Monitory systems**
  - Physiological monitoring
    - Measurements of pulse, respiration, blood pressure
  - Functional monitoring
    - Measurement of general activities, motion, meal intake
  - Social interaction monitoring
    - Phone calls, video communication, virtual participation in groups
- **Automated alarm systems directly connected to hospitals**
  - Incidents like a fall or collapse
- **Cognitive/sensory assistance**
  - Medication reminder, lost key locator

Can help reduce healthcare costs

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## Age in Place

- Smart home technology can allow occupants live more independent lives
- Allows family members to keep an eye on an aging parent
  - 72% of consumers aged 25-34 say they would sleep better at night if their parents & grandparents had smart home technology — survey 2012
- Use of robotic technologies in the home

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## Age in Place

Smart Home Aging in Place monitoring possibilities

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## Peace of Mind

- **Knowing your family is safe**
  - Security monitoring
  - Activity monitoring
- **Knowing your home systems are functioning**
  - HVAC
  - Leak protection
- **Knowing your home and property is secure**
  - Doors/windows are locked
- **Knowing that if anything happens you will be alerted in some way**
  - Text message reporting
  - Email
- **Knowing that you are saving energy**
  - Environmental impact
  - Economic savings



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## Market Strategies

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## Emerging Opportunities

- **The connected home presents numerous growth opportunities for businesses**
  - Create new partnerships
  - Develop innovative business models
  - New services to be provided and maintained
  - Embrace new technologies
  - Address new markets

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## Marketing

- **Consumers are most willing to adopt smart home technology when:**
  - Making renovations or upgrades to their homes
  - When they buy a new house or move
  - Life changes
    - Having a first child
    - Progressive or traumatic health changes
    - Health changes with parents or grandparents
    - Pets
- **Age plays a role**
  - Consumers 55+ are driven by cost savings
  - Consumers 25 – 34 driven by technology
    - Music, movies, interactive features, sensors, automation
- **Packages**
  - “The Entertainer”
  - “The Peace of Mind”

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## Challenges

- **Challenges of Smart Home Technologies**
  - Ethical questions about privacy and data protection
    - Data security
    - Considered the #1 concern regarding a connected home
  - Cost of implementation
    - Balance of wants/needs, initial costs, time savings, energy savings, convenience, peace of mind
  - More vulnerabilities when using an overall system approach
    - More possibilities for potential error
  - Complexities in the multiple functionality of the technology
    - Programming
    - Ease of use/learning curve

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## Questions to Consider

- **Ask yourself or your client:**
  - Is the system intuitive and user-friendly?
  - Do You/I want to incorporate basic components or something more extensive?
  - Will the technology fulfill a need?
  - How will I learn to operate the system?
    - Is there assistance if needed?
  - How easy is it to make changes on the system?
    - Adding to components the system in the future
  - Will this system save me money and improve my life satisfaction?
    - Cost savings vs. Initial cost vs. Peace of mind

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# Connected Home Solutions

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## Availability

- There are plenty of Smart Home Technologies available
  - Custom Installation
    - Equipment, components, wiring, programing
    - Training
    - System maintenance
  - Can be purchased technology store or online
    - Smart thermostats
    - State-of-the-art and simple security systems
- New home technologies are entering the market nearly every day
- There are entire companies dedicated to creating smart home technology
  - Home Kit
  - Nest
  - Echo

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## Products

- Thermostats
- Video monitors
- Speakers
- Televisions
- Smoke & CO detectors
- Remote door locks
- Water monitors
- Lighting controls
- Blinds
- Appliances
- HVAC
- Garage controls

**\*\*Compatibility is key\*\***  
*Technology vs. Connected*

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## The Smart Home Hub

- A **“Smart Home Hub”** is tool for turning an automated home into a smart home
  - Acts as the brain of the smart home
  - Communicates with individual devices
    - Tells them what you want to do
    - Based on your daily routines
  - Provides unifying software through which you can control all those devices
    - Usually an app for a smartphone
    - App lets you set different scenarios based on different prompts
      - “Goodbye,” “Evening Scene,” or “Good-morning”
  - The Hub can also communicate with the user when unexpected things happen

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## Examples

- **Apple - HomeKit system**
  - Allows third-party hardware to work together as one
    - Apple’s devices at the used as controls
  - Users can give Siri voice commands
    - Can control individual devices
    - Can control entire “scenes” in the home
      - A person can tell Siri, “I’m going to bed”
        - » Doors will lock, lights will turn out, thermostat adjusted

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## Examples

- **AppleTV can work as a hub for its smart home system**
  - Allows users to control devices even while they’re away from their home
- **Apple created “Works with HomeKit”**
  - Users & device makers will know the system will work together with other smart home products



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## Examples

- **Google:**
  - In 2014 purchased the smart home thermostat & smoke alarm maker Nest Labs for \$3.2 billion
  - Nest has released its own developer standards so that non-Nest products can communicate with its own devices
  - Purchased security camera maker Dropcam

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## Examples

- **Google has created a smart home system:**
  - Brillo
    - Designed to do more than just manage smart home products
      - Operating System
    - Google will use it for its smart home products
  - Also debuted “OnHub”
    - Wi-Fi router that will likely become the heart of a Google-powered smart home



Google “OnHub”

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## Examples

- **Samsung:**
  - SmartThings
    - Works across iOS, Android and Windows Phone platforms
  - You can write rules for the connected devices to do specific things
    - Go to sleep, wake up, leave, or come home
  - Uses an open platform to connect a plethora of devices made by Honeywell, First Alert, Kwikset, Bose, and others
    - Allows user to connect everything from appliances to lights to a garage door opener



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## Examples

- Amazon:
- **The voice-activated "Echo"**
  - Plays music,
  - Tells user the weather
  - Can answer questions
  - Can also be used as smart home hub
    - The Echo can connect to Philips, Samsung, WeMo, and other device makers to control lighting, thermostats, and door locks with voice commands



INTRODUCING AMAZON ECHO  
THE SCARY TRUTH

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## Summary

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## Summary

- **"Smart Home" or "Connected Home"**
  - The term used to define a residence that has appliances, lighting, heating, air conditioning, TVs, computers, entertainment audio & video systems, security, and camera systems that are capable of communicating with one another and can be controlled remotely by a time schedule, from any room in the home, as well as remotely from any location in the world by phone or internet.
- **"Smart technology" vs. "the connected home"**
- **The North American market recorded a 70 percent year-on-year growth in 2014 in the installed base of smart homes**
  - 28 percent of all households by 2019 will be "connected homes"

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## Summary

- **Smart/connected homes can increase savings**

- Utilizing home controllers integrated with all home sub-systems to increase savings by controlling systems
  - Lighting
  - window coverings
  - HVAC
  - Irrigation
  - monitoring usage and consumption



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## Summary

- **Consumers most willing to adopt smart home technology when:**

- Making renovations or upgrades to their homes
- When they buy a new house or move
- Life changes

- **Challenges do exist**

- Complexities in the multiple functionality of the technology
  - Programming
  - Ease of use/learning curve

- **Major companies already involved in the connected home market**

- Apple
- Google
- Amazon



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