

# Practical, Affordable Smart Home Solutions for People with Disabilities

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# What is a Smart Home?

- Designed for access, security, comfort & livability
  - Ease of use features
  - Supports functional independence
  - Individualized to your needs and interests
- 
- Smart home features are becoming increasingly available and affordable

# Who Needs a Smart Home?

- People with:
  - Mobility limitations
  - Attention/memory/other cognitive problems
  - Medical care needs
  - Transition from supported to independent living
  - Emerging risk of nursing home placement
  - Motivation to increase independence thru AT

# Smart Homes can...

- Improve safety and security
- Assist with mobility, transfers, access
- Automate routine appliance functions
- Allow remote control of home features using a variety of access tools and supports
- Provide communication tools, including passive occupant monitoring
- Assist with task support, shopping, bill-paying, social interaction

# The Right Fit:

## **Assess:**

- Functional abilities and interests

- Human support resources

- Environmental supports in place

- Safety concerns

- Medication management

- ADL/IADL (food, hygiene, money management)

- Financial resources/insurance

- Work collaboratively to problem-solve solutions

*Important: What is best access tool for remote control?*







# Safety

- Stovetop monitor
- Tub overflow monitor
- Automatic coffeepot
- Motion-activated lighting
- Window escape systems
- Med-alert medallion





# Apple Watch 4-6

First accurate and reliable falls detection and response device.



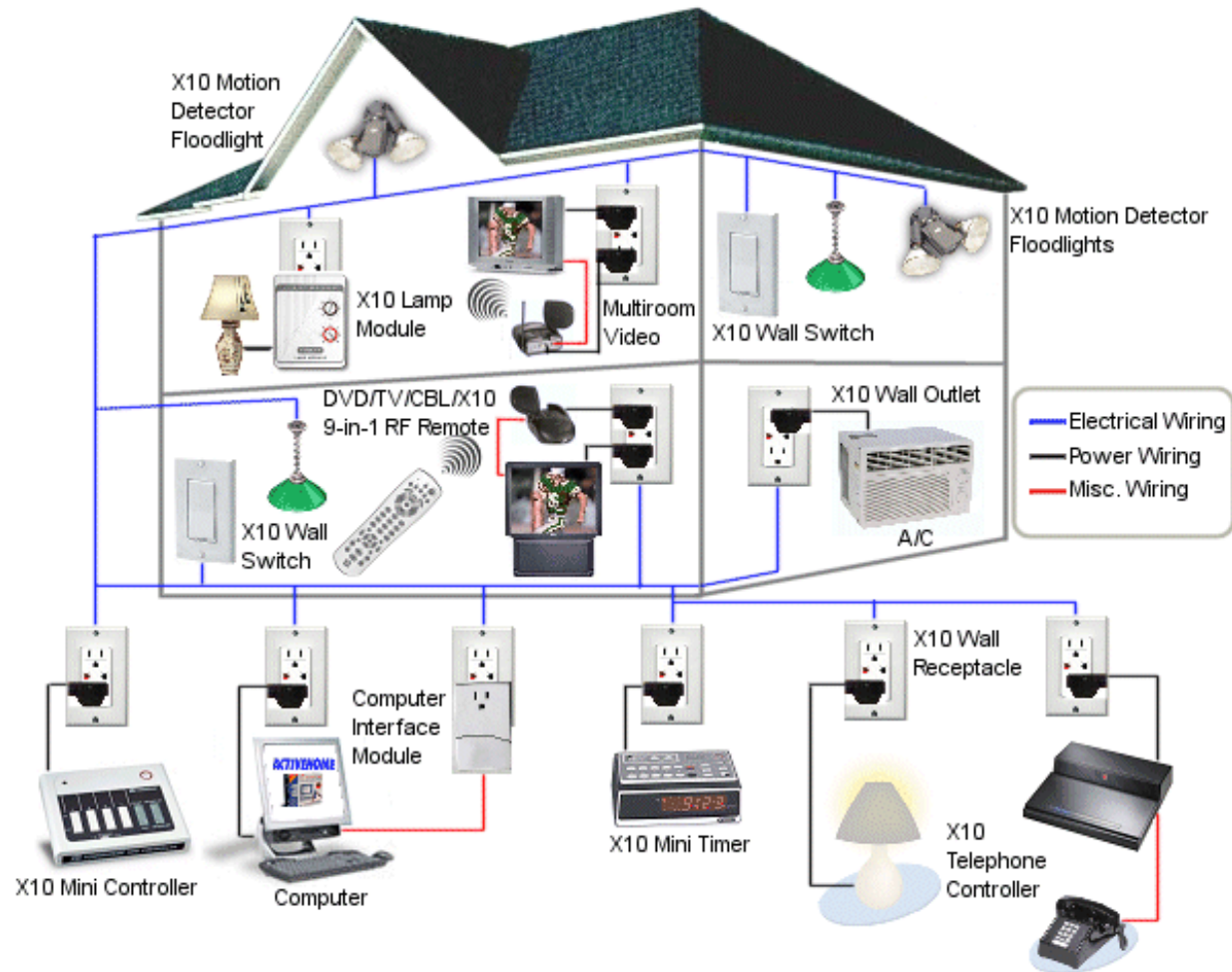
# Transactions & Housekeeping

- Automated Bill Paying
- Automated Grocery Order and Delivery
- Auto Plant Watering
- Robot Vacuum Cleaner
- Automated pet feeder



Rhoomba Vacuum Cleaner - \$375

# Appliance Controls



# What can be automated or controlled remotely?

- Lights and lamps
- Media equipment (tv, radio, camera, stereo, etc.)
- Appliances with on/off switches (fans, motorized doors & window shades)
- Door locks
- Thermostat
- Phone, Computer
- Occupant monitors

# The Origin of Smart Homes – x10 System Electronic Aids to Daily Living (EADL)



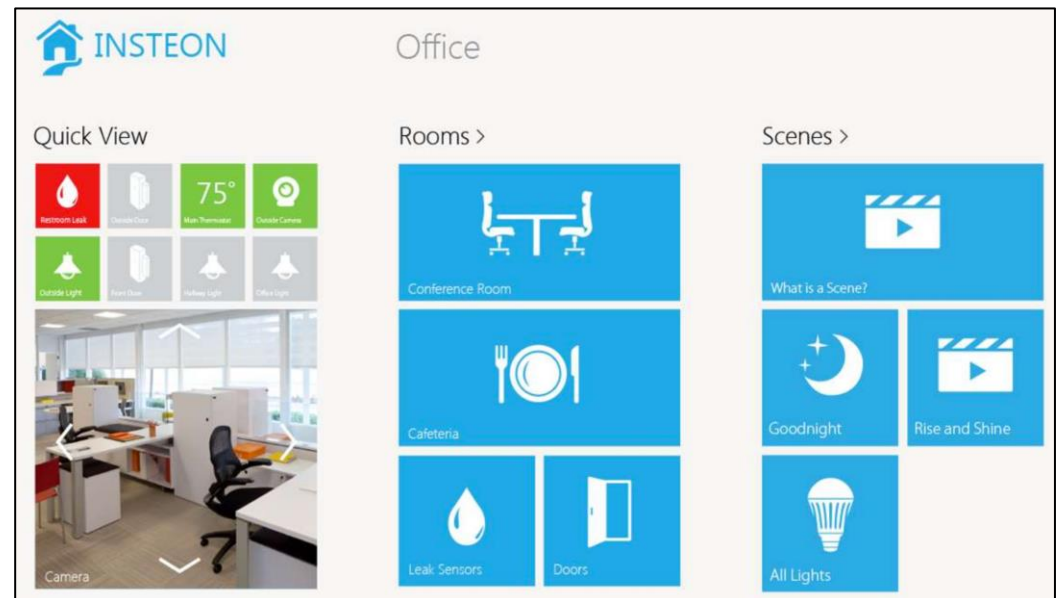
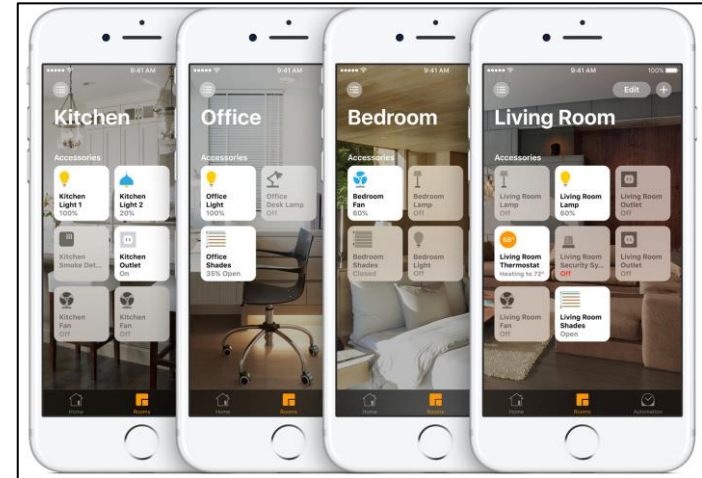
# Lights & Appliances

- What do you want to control?
- What is the best switch for your mobility?
- What is the best transmitter of your command?
- What technology will operate the device based on your command?



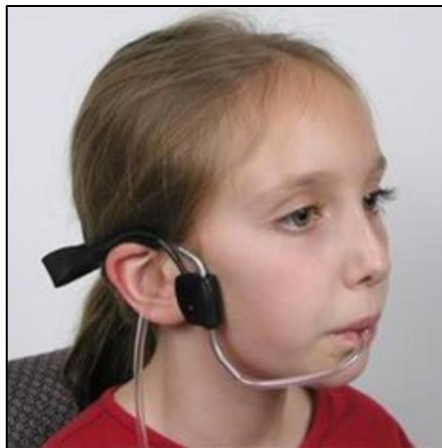
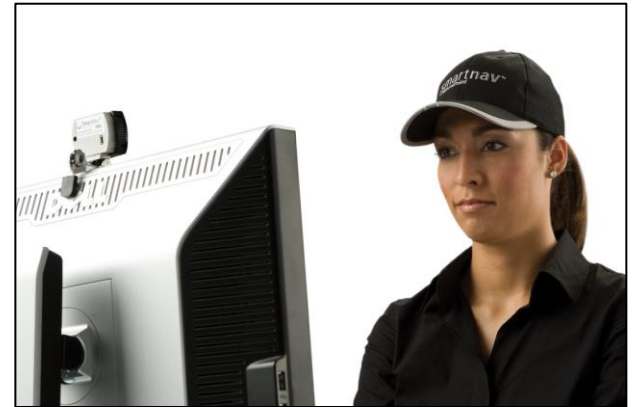
# Control Module

- PC, tablet or phone
- App
- Remote module



# Switches

- Tap or proximity switch
- Head control
- Sip-n-puff
- Voice control
- Eye Gaze



# Voice Considerations

*(Apple Siri/Amazon Echo/Google Home/  
Microsoft Cortana)*

- Clear, concise commands
- Quiet environment
- Proximity to microphone
- Proper labeling of appliance modules
- Triggering of chained commands



# Competing Technologies



# Monitoring Options:

## Quiet-Care by Care Innovations

- Wireless motion sensors/changes in routine noted

## Grandcare

- set-top box on tv acts as communicator and control center for remote sensors

Vendor comes to your home to set these up and teach how to use them;  
monthly fee – Medicaid may support fee.

# Motion Sensors



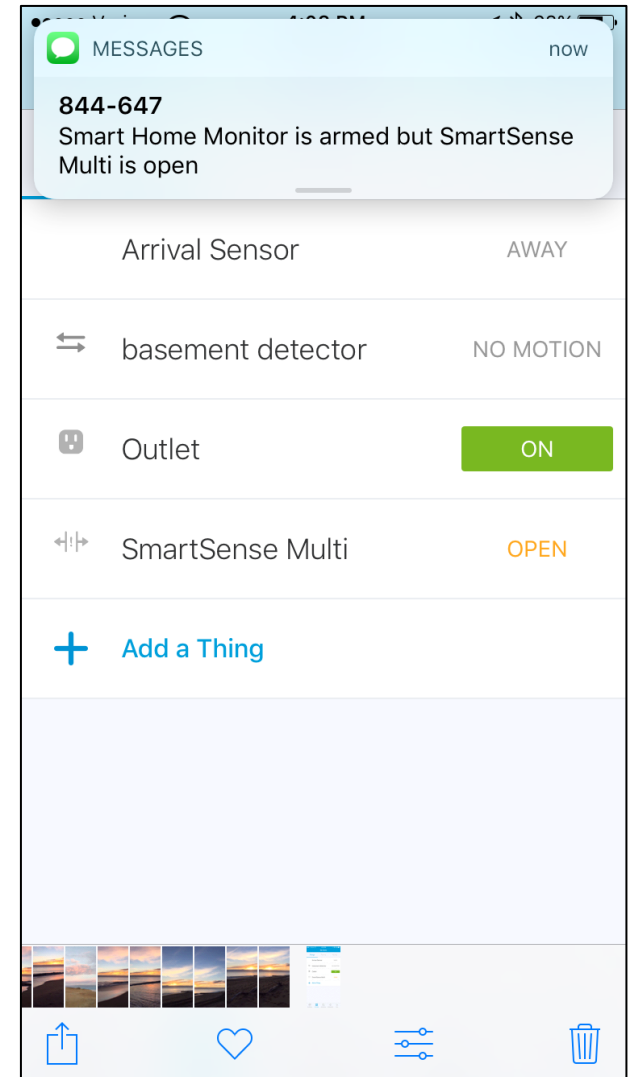
Phillips Hue Motion Sensor - \$35



SmartThings Arrival Sensor - \$16



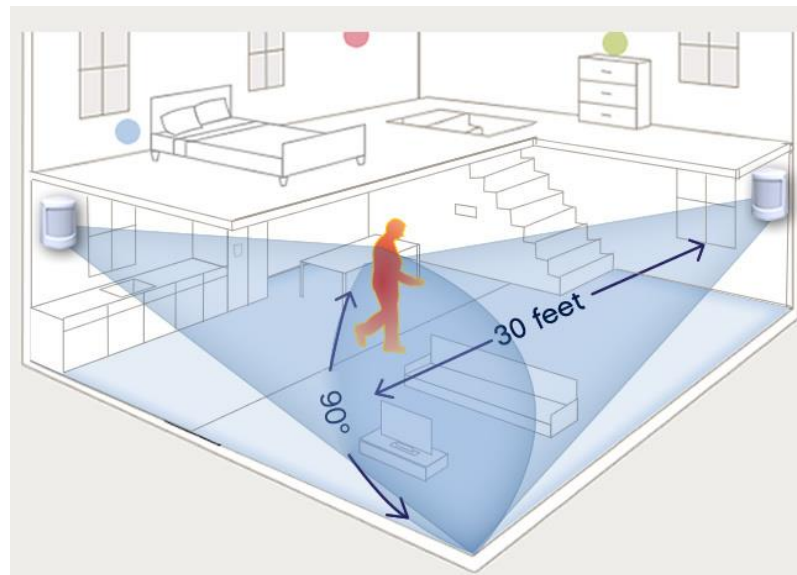
Homekit Door Sensor - \$29





# Sensors Go Where?

Motion Sensors	Arrival Sensors	Doorway Sensors
Living spaces	On key ring	Front & Back Doors
Garage door	On vehicle or bicycle	Bathroom door
	In backpack	Medicine Cabinet
		Refrigerator



Ceiling Fan with  
Lutron Wall Switch (\$200)



First Alert Smoke & MO Alarm (Homekit  
Enabled) (\$150)



Nold Garage Door Opener  
(\$120)



Honeywell Lyric Thermostat  
(\$158)



ConnectSense Smart Outlet  
(2 lamps)  
\$59



Phillips Hue Motion  
Sensor (3)  
\$120

Apple TV (\$150)



iPhone or iPad  
with Home app



**Total: \$898**

# For under \$900, you can...

- Access home through garage
  - Control 2 lights and/or appliances
  - Auto-Manage thermostat
  - Auto-Manage overhead fan
  - Voice control television
  - Broadcast smoke/MO alert to loved one
  - Passively monitor activity in home
- 
- Automate these actions based on triggers or scenes  
*and while away from home via Apple TV*

# Front Door considerations



Ring Video Doorbell - \$179



Open Sesame Door Opener  
\$2200



August Smart-Lock - \$229

# Smart Home Assessment

- Mobility concerns
- Safety
- ADL/IADL Interests/Needs/Goals
- *What human supports (nagging) can be simplified or automated to promote independent living?*
- What tools might help?
- Recommend/install for loaner trial/adopt

# Case Study Example

- 25-year old with mild motor and cognitive impairment
- Lives with parents and twin brother who is severely autistic
- Works part-time at parents' metals shop as metal tech
- Drives locally
- Has fiancée (now married)
- *I wanted to live on my own in my own home*



# Concerns

- Remembering to Do Things (Wake up!)
- Medication adherence – hospitalization risk
- Home safety – especially fire risk when cooking
- Overly long showers (water bill fears)
- Forgetting keys – locked out of house

# Demonstration Video

# Medication Management

**MD2 (\$799)**

**Epills.com**

**FREE Unlimited Patient Monitoring**

This is the MedSmart message center. The user has missed their dose.

by VOICE (Phone Call)  
by E-MAIL  
by TEXT

994019  
e-pill MedSmart  
PLUS Monitored

www.epill.com  
1-800-549-0095

The advertisement features a blue MedSmart device with a screen and a pill dispenser. A red arrow points from the device to a Nokia mobile phone. Below the device is a pill bottle and a pill. At the bottom, two hands are shown interacting with the device, one holding a pill. The text 'e-pill MedSmart PLUS Monitored' is written below the device. The text '994019' is written above the pill bottle. The text 'www.epill.com' and '1-800-549-0095' is at the bottom right.

# Cooking Safety

- **Cook Stop**
- American Company
- \$359
- Works with Convection Ovens



# Morning Wake-up

**Sonic Boom**

Bed Shaker Alarm  
(\$38)



# The Shower!

**Shower Manager**  
(\$149)



# Take Home Thoughts

Explosion of smart home technologies

Individualized supports for people with any disability

Focus on: (1) Safety, (2) Accessibility, (3) Comfort and (4) Ease of Use

Questions?