Smart Homes

Accessibility to Accessibility with

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If We Can We Must…….

Are we looking for nails when we should be looking for tasks?

Designing for population fundamentally different from ourselves :

- Requires more than just thinking about them
- Ethnographic approach
- Expert review especially about existing technology in market

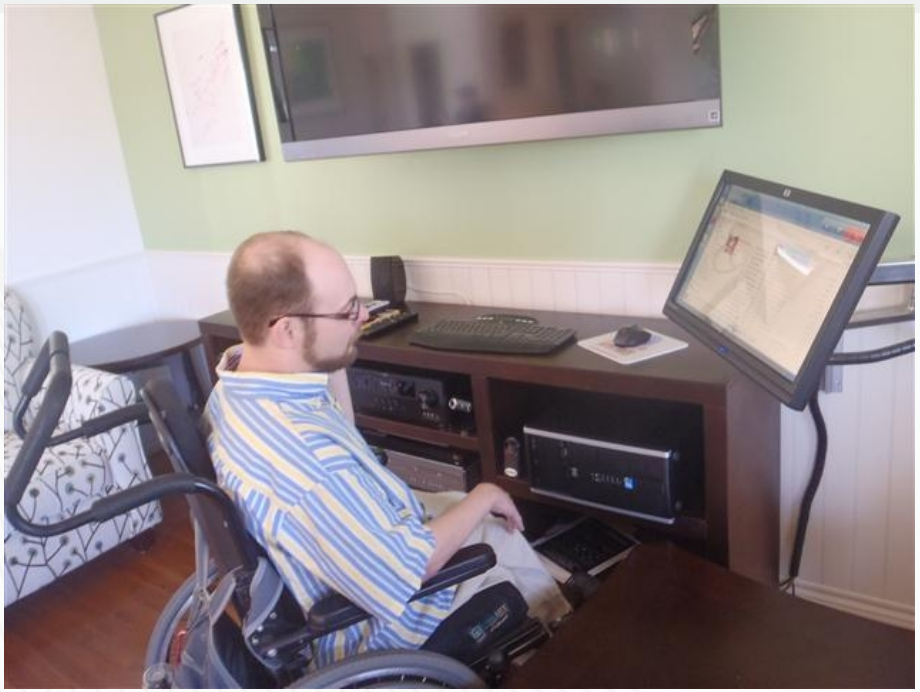
Smart home people

“typical” smart home user

Smart homes are expensive

People with Accessibility needs

The user and use conditions might be different than what you have personally experienced



People with Accessibility needs

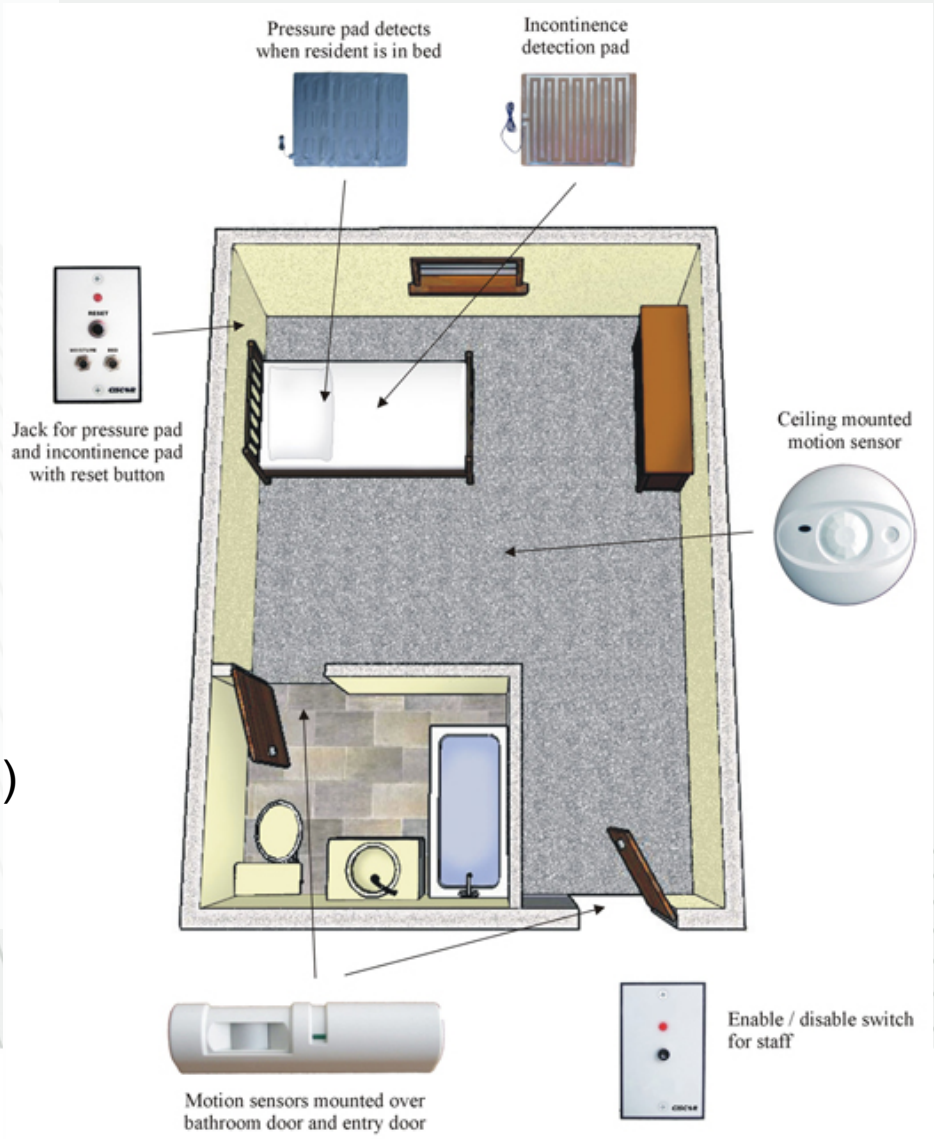
Sometimes the end user is *very* different …….

Suggestions for bridging the gap

- A call for designer involvement – know your population
- Respect the gap between what we can easily do and what we should be doing
- Task driven design, not technology driven tasks.
- Designing with scenarios
- Proxy users and experts
- Pay appropriate attention to I/O and re-configuration design

Smart Homes

- Sensors
- Wires
- Motors
- I/O for humans
- Smartness
- Rules
- Bits not attached to walls
  - Controllers (pad/smartphones)
  - Cameras



Accessible to, Accessible with

- Making smart homes accessible to all
  - Physical interactions
  - Input and output modalities
- Using smart homes as accessibility tools
  - Controlling environment
  - Smart interactions
  - Communication

Making smart homes accessible

Problems encountered by disabled people and the ageing population within a Smart Home

- Using a smart home
- Setting up and changing a smart home
- AT abandonment

Visually impaired

- Visually impaired people might be unable to use a touch screen, receive graphical information and read text on a screen or read printed matter formatted for those with typical vision.
- They may find it very difficult to locate and access equipment.
- It will also be difficult for them to use switches and controls and to handle manuals.
- Using numeric keypads will provide a limited problem.

Hearing impaired

- Hearing impaired people might be unable to receive audio information, understand speech to varying degrees
- Possibly could not use speech as an input method.
- They could find it very difficult to locate equipment (sound location)

Cognitively impaired

- Cognitively impaired people might be unable to operate/ handle pointing devices and understand instructional text.
- They may find it very difficult to locate and access equipment, to use switches, numeric keypads and touch screens.
- Getting information about using systems with manuals may be inappropriate.
- It may also be difficult for them to read text on a screen, use speech as an input method and receive graphical and audio information.

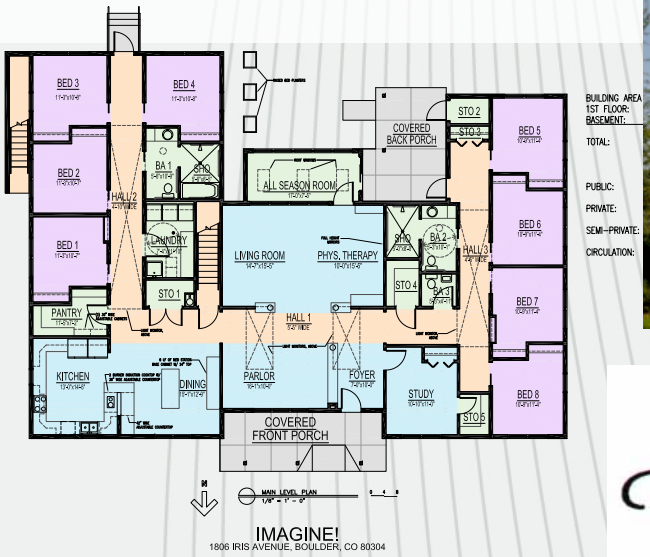
Ageing population

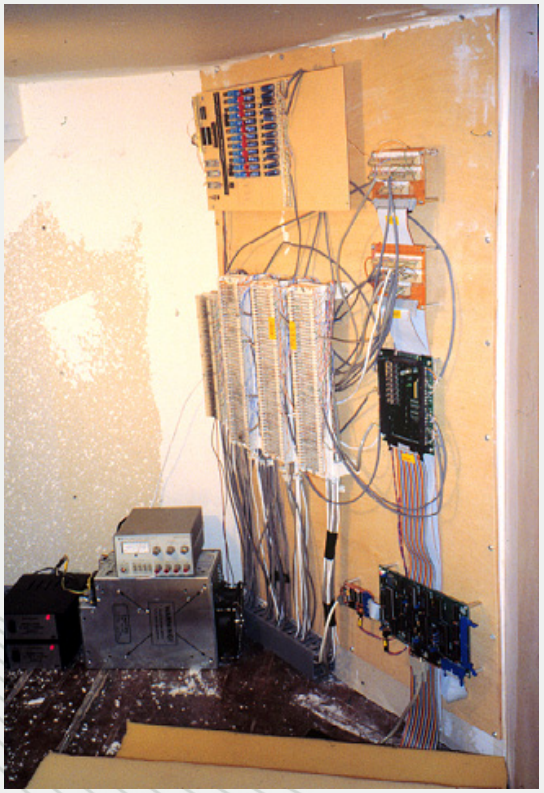
- Elderly people will have limited problems using switches and controls, numeric keypads, touch screens and speech as an input method.
- They will also have limited problems with accessing equipment, reading text on a screen, receiving graphical information and handling manuals.
- Seniors may not understand interface metaphors and have idiosyncratic models of how their systems work, leading to breakdowns which are never repaired

Think about the home theatres in your parents/ grandparents homes and who set them up.....

First some examples….

- Mike Mozer's adaptive house
- The Visions system
- Georgia tech aware house
- Imagine!
- Oakhill





Visions for Independent Living, Inc.

VISIONS

"Creating Communication Techniques for Choice and Independence"

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Whose Smart Home is it Anyway?

Smarthomes are expensive (can be >10^6 €)

-retrofit

-new ones

A lot of our conversations about Smarthomes are really about third party Smarthomes

- private entities (imagine!, Oakhills)
- Public NGO and semi-government groups
- government built

Different types have different services

- Single family smart home may use system to control environment – from music to temperature to lighting
- Group homes may support end user controlling personal environment (temperature /lighting / communication)
  - But also have ‘client management issues that touch privacy and other ethical domains

Typical support (AT) functions

- Type one (personal)
  - Provide an environment that is constantly monitored to ensure the householder is safe (activity monitoring)
  - Automate specific tasks that a householder is unable to perform (turning lights on or off)
  - Support a safe and secure environment (alerting the householder of potentially dangerous activities)
- Type two (caregiver/management/therapeutic)
  - Alert helpers or carers should the householder be in difficulties (through linking to a local community alarm scheme)

Other services provided

- Enable and empower the user
  - Communication device (AAC)
  - Capturing and expressing their world
- Facilitate the rehabilitation of householders
  - By giving auditory and/or visual prompts
    - Therapeutic prompting
    - ADL prompting
    - Exercise prompting and monitoring

Some problems to consider in design

- Personal homes
  - What does the user want? (versus what I can do / I want to do)
  - Sometimes the boundary of home and AT gets thin
  - The home theatre issue (Don Norman)
  - Mike Mozers abandoment of the smart in his home
- Group/therapeutic issues
  - Privacy – why did grandma gain 60 Kg last night?
  - How to respect dignity, esp. in dementia)

Thanks for coming
You can contact me at
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and thanks to John Gill
(http://www.johngilltech.com/)
for his excellent lists about smart homes)

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