Home Automation To Assist The Family Caregiver

Making Sense for Practical Application

Mark Servais :: Technologist/Caregiver

Circles of Life Conference 2019

Why?

- Family caregivers are part of a unique collective where no two members are particular the same.
- (2015) According to the National Alliance for Caregiving / AARP there are 44 million of us.
  - 8 out of 10 provided unpaid care
  - 16.6% care for adult with disability or illness
- Metlife Study of 2011:
  - total financial losses range from $283,716 to $324,044.
  - those in fair to poor health - 14%-17%
- (2013) 470 billion value of unpaid care - more than Medicaid spending and paid home care

Our Future with Home Automation is Here

- (State of Caregiving 2018) Future outlook for caregiving (Age Wave - Ken Dychtwald, National Institute of Aging - John Haaga, Gerontological Society of America - Laura Sands
  - Apps and online tools to assist caregivers will proliferate.
  - "Smart home" sensors will support caregivers and older adults who want to age in place.
  - "Care Pathways" mapped on genetics, life/health preferences, and metadata analyses of populations will improve health interventions and outcomes.
  - Robots, self-driving cars, and other forms of AI will lessen the load on human caregivers.
  - Interdependence (co-housing, Village movement, inter-generational communities) will become more common. This will reduce isolation and loneliness.

Yes but how does home automation (smart home) help all of this?

- Control of home's systems from a set of defined interfaces
  - Means not only control of devices, but event notification and response.
  - Routine daily activities can be internally "outsourced".
  - Communication takes a giant leap forward. Remote check-ins.
  - Voice assistants have taken this to the next realm.

It frees you up in situations, to focus on providing the right care in a timely manner!

https://www.cedars-sinai.org/newsroom/cedars-sinai-taps-alexa-for-smart-hospital-room-pilot/

Los Angeles, Feb 25, 2019

Cedars-Sinai Taps Alexa for Smart Hospital Room Pilot

Cedars-Sinai patient John Gooch said his voice activated assistant is "super cool." He uses it to listen to music and contact his nurses. Photo by Cedars-Sinai.

A pilot program underway in more than 100 patient rooms at Cedars-Sinai is allowing patients to use an Alexa-powered platform known as Aiva to interact hands-free with nurses and control their entertainment. Aiva is the world's first patient-centered voice assistant platform for hospitals.

In the pilot project, patient rooms are equipped with Amazon Echos and patients simply tell the device what they need. For example, patients can turn their TV off and on and change channels by giving verbal commands like, "Alexa, change the channel to ESPN." A patient who needs assistance getting out of bed might say, "Alexa, tell my nurse I need to get up to use the restroom."

Mark Servais

- 30+ year career in technology - software
- Sitecore Solutions Architect - Former 5x Technology MVP
- Dad of Lucas - 20 year old with Duchenne Muscular Dystrophy

My Life As A Caregiver

- Co-managing both my boys issues
- Lucas progression accelerated at 12
- Everything moved in double-time since then
- "How do people do this?"

Care Plan Activities

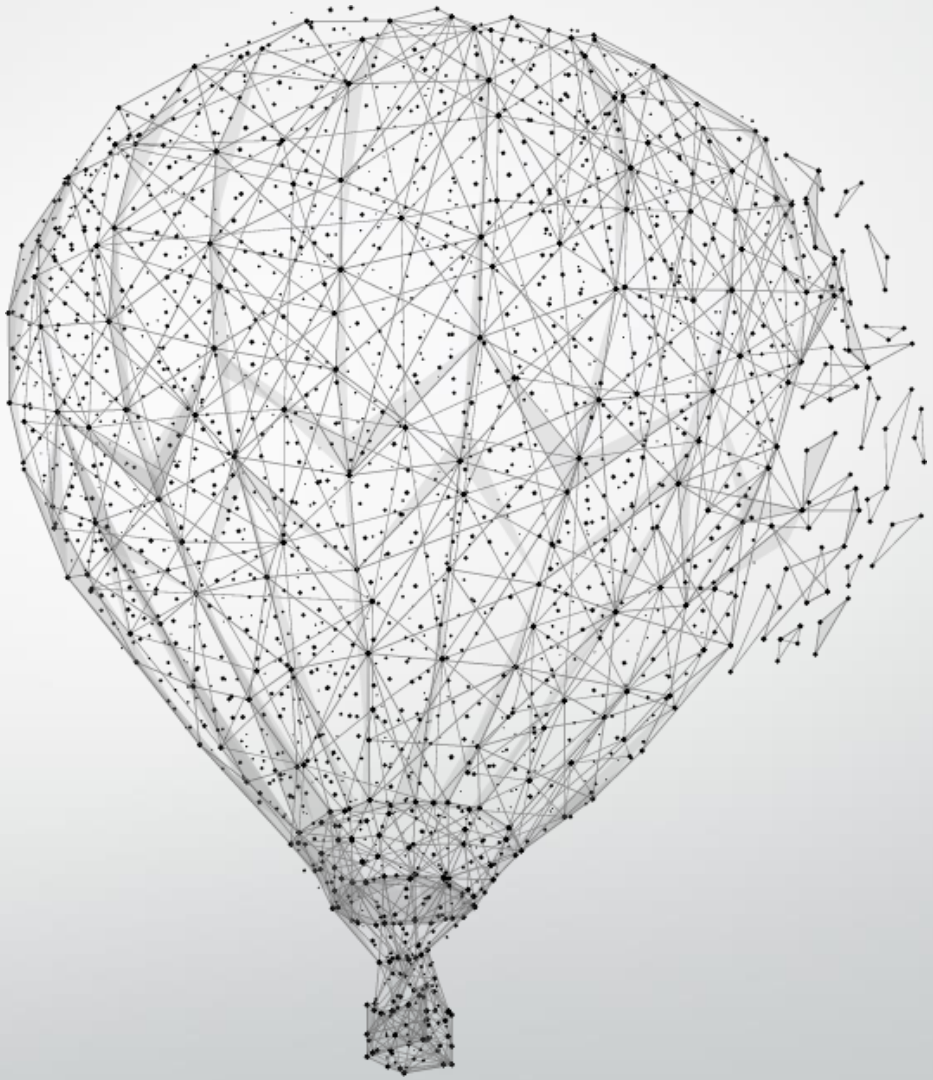
- Notifications
- Reminders
- Schedules
- Activity

Our Issues

- Schedules
- Notifications
- Keeping up on Activities
- Self-Health
- Knowledge Upkeep

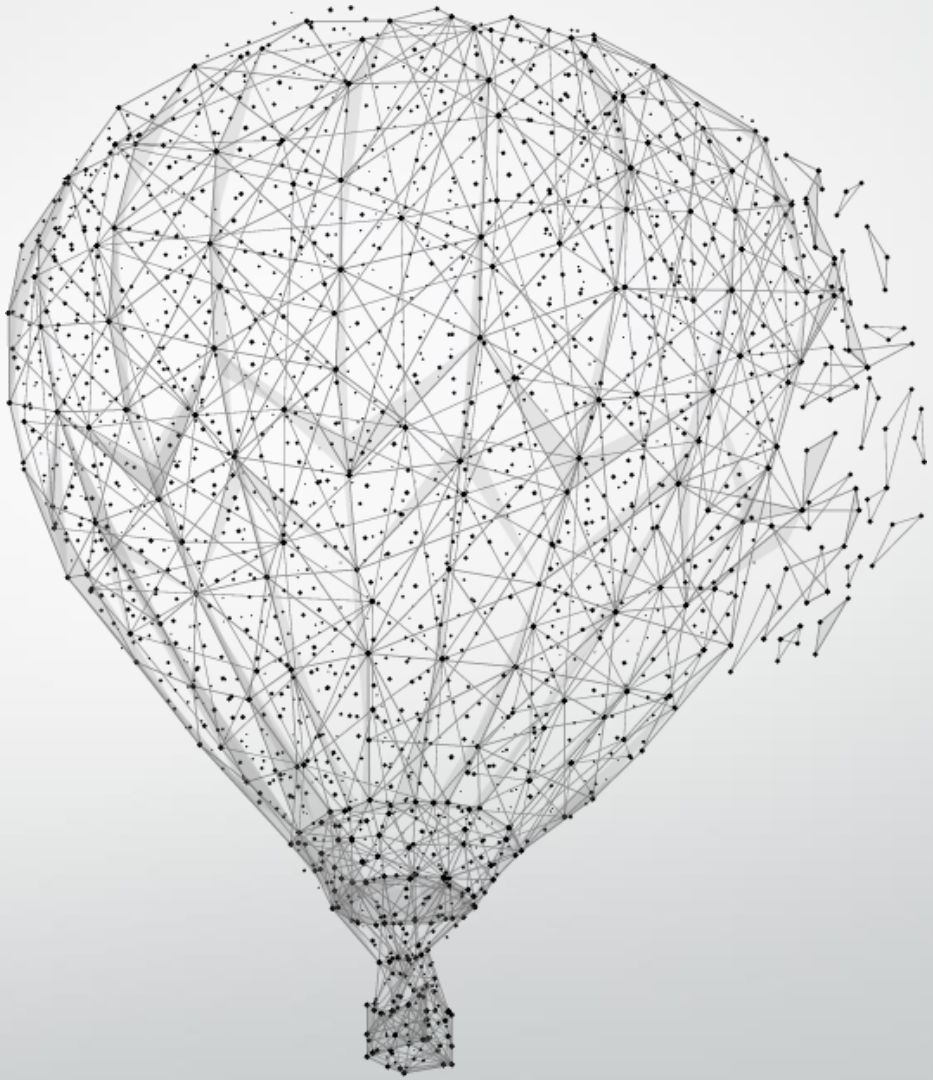
Definition: Family Caregiver

A person who does whatever it takes to provide care to best of their ability.



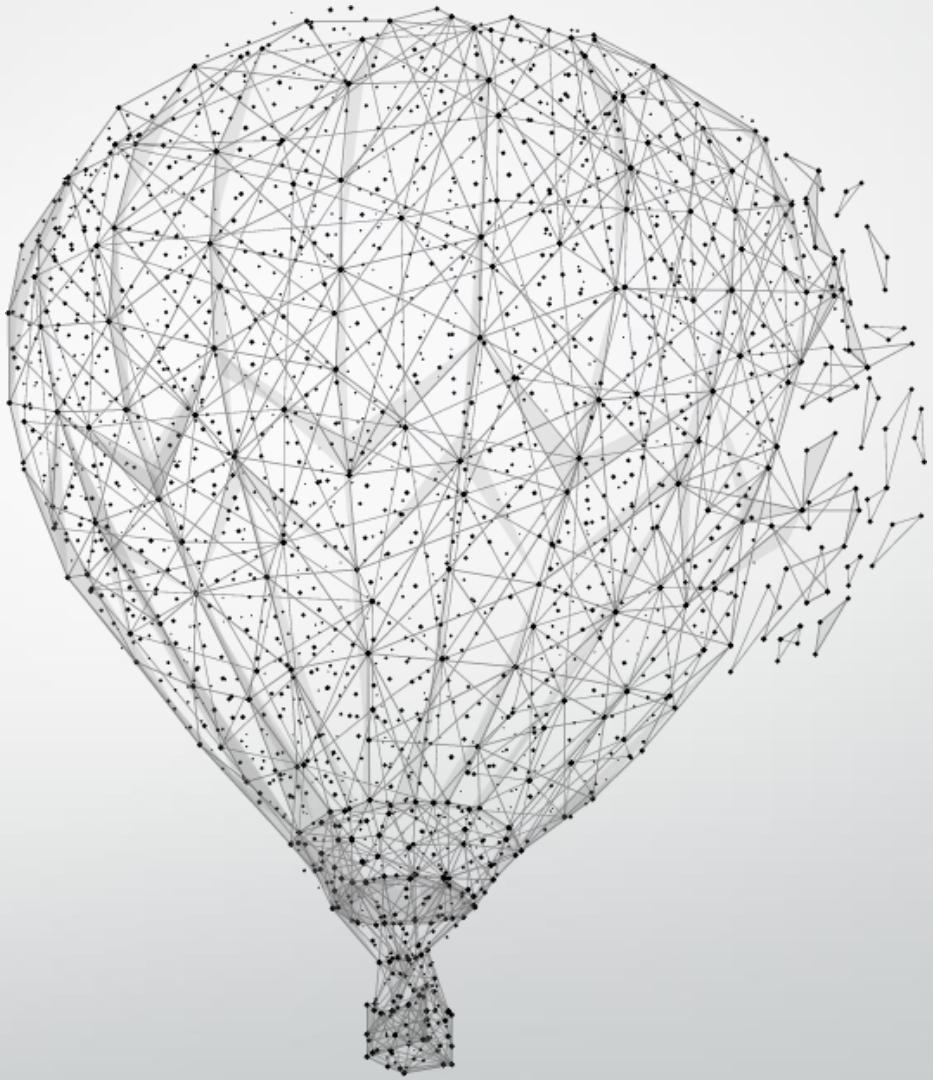
Why was all this important?

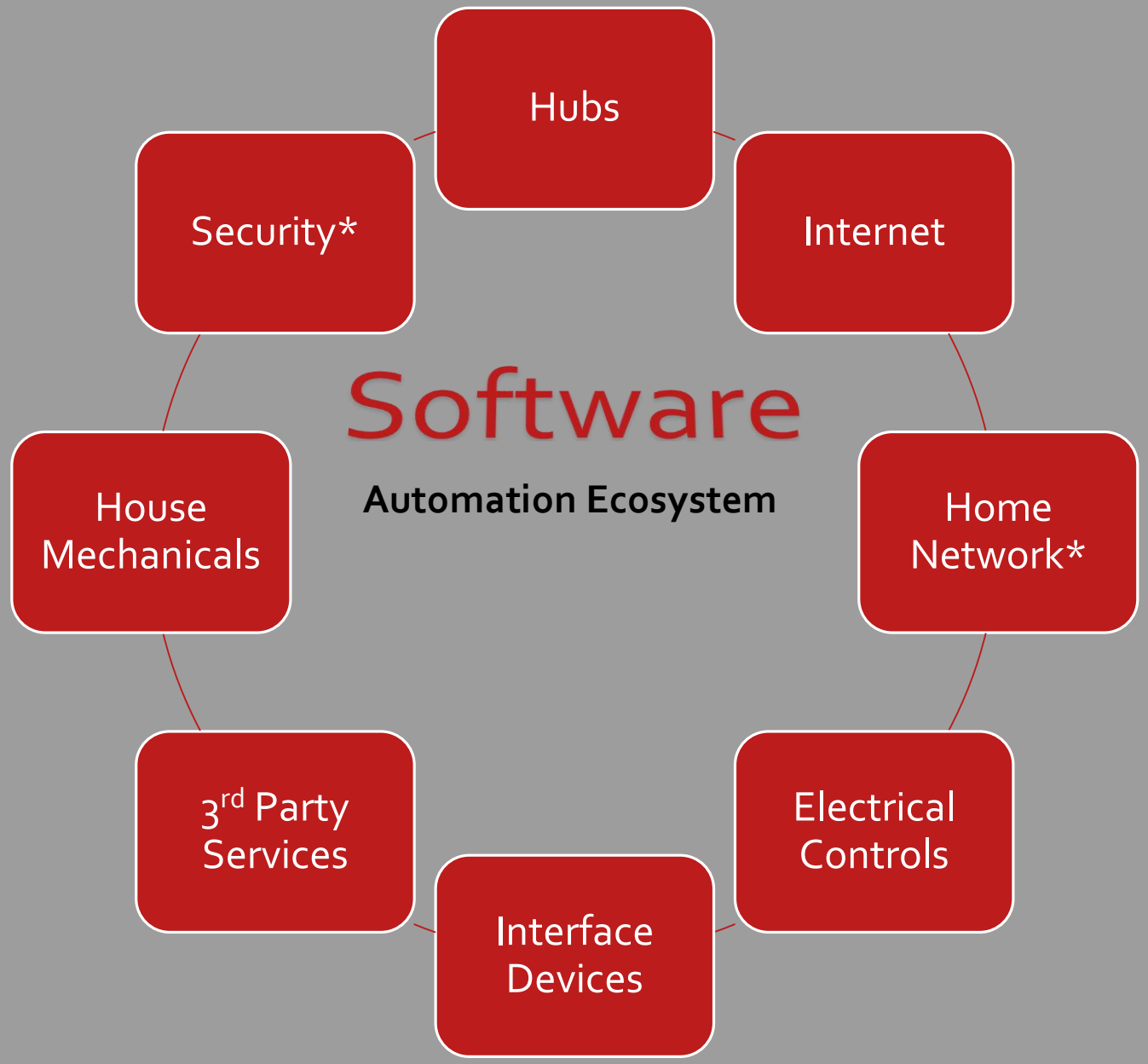
This technology is mostly uncharted. We need to understand what our struggles are before we try to apply assistance.



Home Automation

Ideally, this is a means to better a life, using the latest technologies and process improvements available.



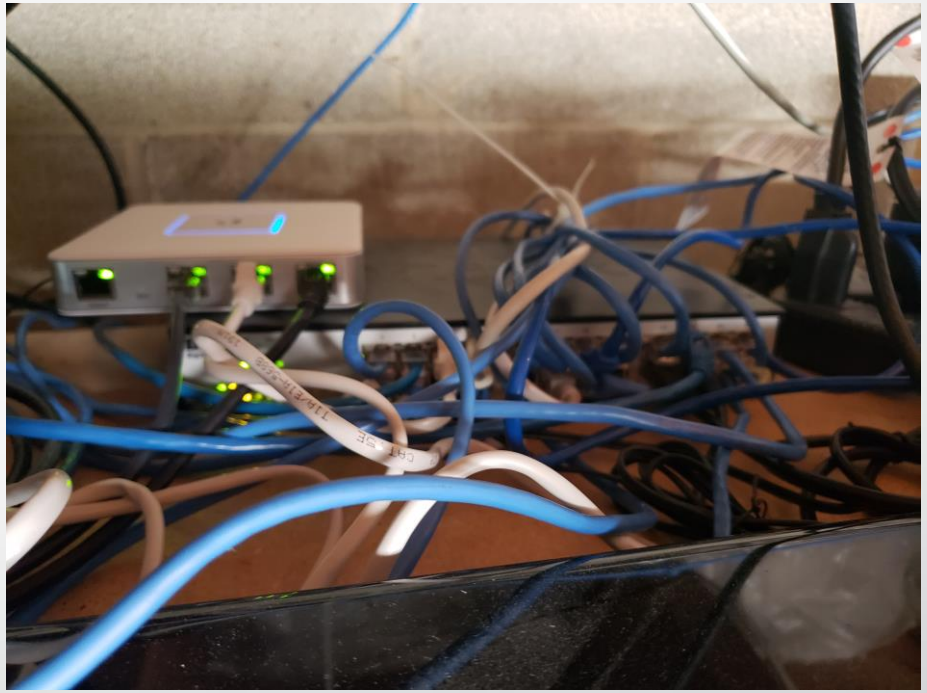

Hubs
Internet
Home Network*
Electrical Controls
Interface Devices
3rd Party Services
House Mechanicals
Security*
Software
Automation Ecosystem

Hubs

- Not every device requires a hub, but they consolidate a lot of function for you.
- Typically requires a smart phone/tablet.
- Each Hub will support different devices, different communications, different features.
- Proper approach to selection - decide the things you need to do, what devices will help you do them, evaluate the hub that fits within your price range.

Internet

- Most devices if not connecting to a hub, will likely need to connect to the cloud.
- Internet doesn't need to be super high end, but needs to be consistent. Can't be dial up.
- If Internet not available, you may have to rely on cellular based devices. Not easy for technical novice.

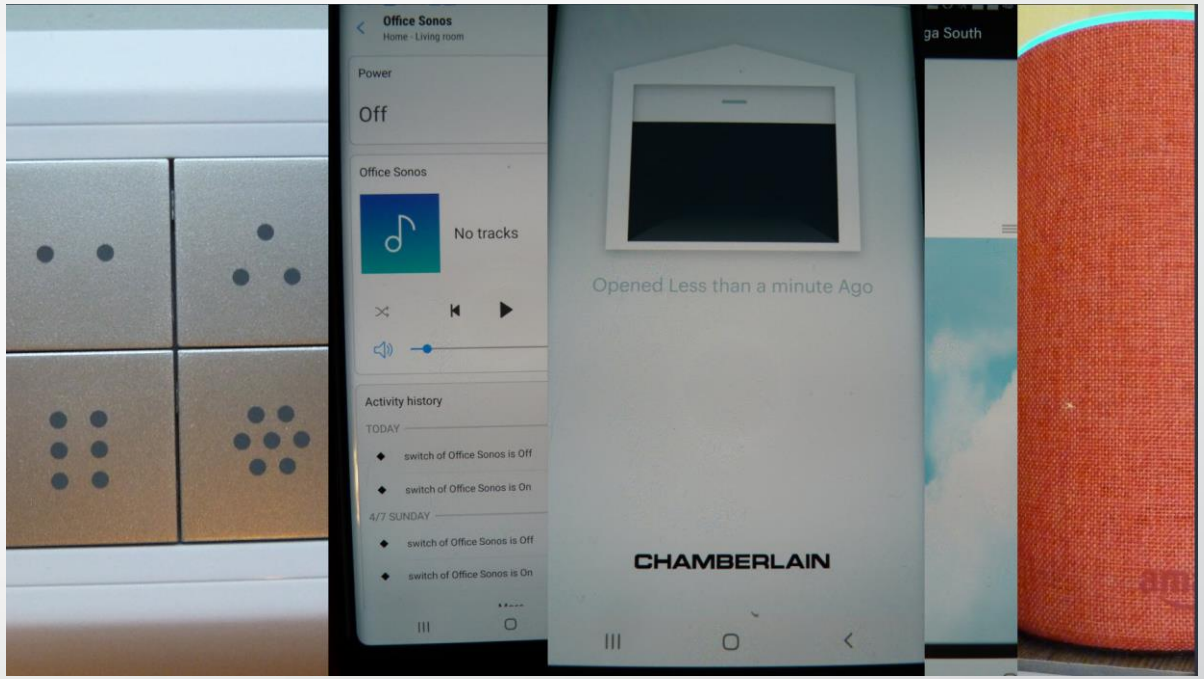


Electrical Controls

- Range of controls, from individual light bulbs, appliances, light switches, light fixtures.
- Devices have different compatibility, communication signal types, functions.
- Beyond on-off-dim, there can be many versatile uses.

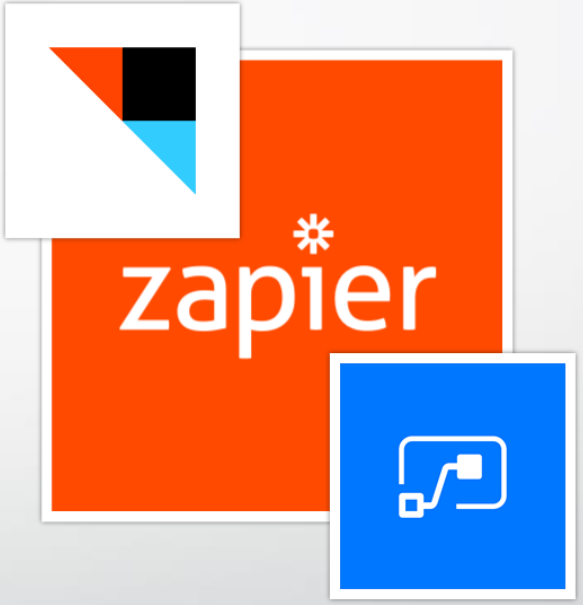
Interface Devices

- Interactive, visual, auditory, motion-based - interfaces for every solution it seems.
- Bottom-line - needs to be available when needed.
- Think in steps of interaction - how many steps do I need to take to get a desired action?



3rd Party Services

- These services fill in the gaps that the current hubs/devices can't perform.
- Services are typically based on a few integrations and products with limited sets of abilities.
- These services help fill the gaps and create easier experiences.



House Mechanicals

- HVAC systems, water control, utility monitoring.
- Designed to manage the home via versatility.

Discussions And Demonstrations

Disclaimer

I am not a legal expert, an expert representing any government program or alternative funding source for disability, or professional technical support for any of the components being shown.

I do not represent any product company and am not here to sell you on devices or services. Any products or services here are used as an example and you are encouraged to investigate similar products and services that best match your needs.

I am a Dad caregiver, who happens to write software for a living and understand the ins and outs of technology. I will demonstrate what works for us and how my experience may solve a typical problem, while sharing knowledge with you in order to help you help yourself and others in similar ways

I Encourage You To Try This At Home!

It will only get easier from here.

Comfort Levels

Easiest

- Can use a smart phone apps.
- Follow step by step instructions.
- Basic understanding to troubleshoot. (Turn on/off)

Moderate

- Understand some basic networking setup.
- Can revisit through instructions to troubleshoot issues.

Experienced

- Can do intermediate troubleshooting.
- Fair knowledge how devices communicate and types of signals.
- Can communicate descriptively issues with support.

Skillful

- Multidiscipline of skills(Technology, Electrical, Mechanical)
- Can do advanced troubleshooting and speak jargon with support services.

Expert

- Can monitor network packets.
- Utilize scripting language to create software modules.
- Understand small electronics wiring concepts.

Topic: Daily Living

I need you to do these everyday things…

Give Me Light!

- HVAC systems, water control, utility monitoring.
- Designed to manage the home via versatility.

Solution: Turn On Light

01-Minimum

- Smart Plug (w/ App)
- Ordinary Lamp

02-Premium

- Rocker Light Smart Switch
- Smart Hub
- Voice Assistant
- IFTTT
- Button

03-Think About

- How do I use the light normally without automation?
- What other automations do I have?
- What is my minimal viable solution?

04-Skill Level

- Smart Plug
- Rocker Switch
- Smart Hub
- IFTTT
- Voice Assistant
- Button

05-Costs

- Smart Plug - upwards starting at about $15
- Rocker Switch - really good ones start at $40
- Voice Assistants - Start at $40 (watch for discounts)
- Buttons - upwards from $15
- IFTTT - free

Solution: Open The Blinds/Curtains

01-Minimum

- Device Motor Retrofit

02-Premium

- Motorized custom blinds
- Gateway/Bridge (Hub)

03-Think About

- How do I use the blinds normally without automation?
- What other automations do I have?
- Can I install myself?
- Is this crucial to replace the manual option?

04-Skill Level

- Device Motor Retrofit
- Custom Blinds

05-Costs

- Device Motor Retrofit starts around $150 but can go as high as $800
- Custom motorized blinds approx $140 (Ikea) to $1000s.

Demo: Automated Blinds Demo

Topic: Toileting/Bathing

Ascend to the throne!

- I have to go!
- Done with my business.
- And then the phone rings…

Solution: I have to go!

01-Minimum

02-Premium

- Speaker
- Smart Hub
- IFTTT
- Button

03-Think About

- What other automations do I have?
- Incontinence: Will this coincide with recognition of the urge?

04-Skill Level

- Smart Hub
- IFTTT
- Speaker
- Button

05-Costs

- Smart Hub - starting at about $60 ; can exceed hundreds
- Speaker - starting at $70 but not much lower end pricing; for a great speaker expect to spend hundreds
- Buttons - upwards from $15
- IFTTT - free

NOTE:

With the Smart Hub and other devices - your notifications can range from home lighting effects to phone notifications.

Voice Assistants can be utilized for broadcast functions as well as an additional notification trigger.

Solution: Done with my business.

01-Minimum

02-Premium

- Speaker
- Smart Hub
- IFTTT
- Button
- Voice Assistant

03-Think About

- What other automations do I have?
- Are there situations in which I the caregiver will not be present or close by?

04-Skill Level

- Smart Hub
- IFTTT
- Speaker
- Button
- Voice Assistant

05-Costs

- Smart Hub - starting at about $60 ; can exceed hundreds
- Speaker - starting at $70 but not much lower end pricing; for a great speaker expect to spend hundreds
- Voice Assistants - Start at $40 (watch for discounts)
- Buttons - upwards from $15
- IFTTT - free

NOTE:

Wireless doorbells are your friend if you can't support the speakers. Many mid-level units include plug in speakers to distribute the chime.

Solution: Just as my hands are full…the phone rings

01-Minimum

- Smartphone (feature seems to be buried

02-Premium

- Voice Assistant*

03-Think About

- What voice assistant am I currently using?
- Do I want screened calls or true hands free? (Options)

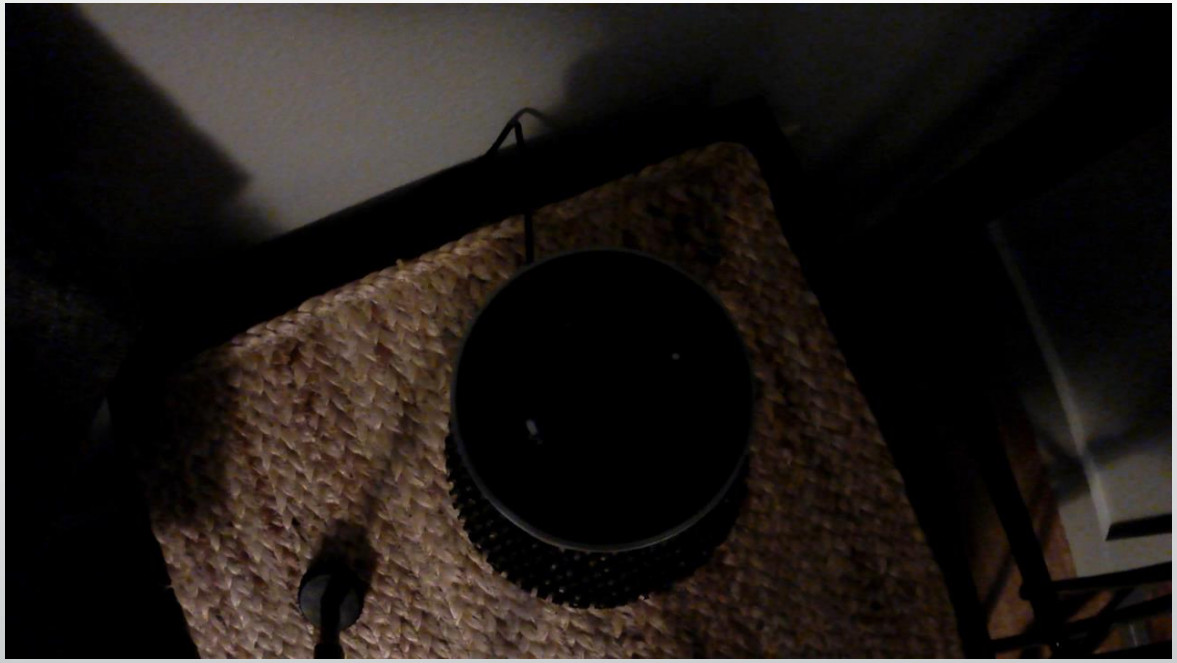
04-Skill Level

- Voice Assistant

05-Costs

- Voice Assistants - Start at $40 (watch for discounts)
- Teleconnect device - $35

Demo: Hands Are Busy



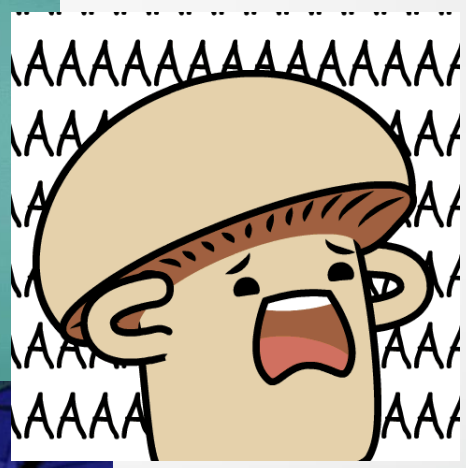
NOTE:

Honestly these are more valuable calling out in urgent situations than receiving calls. I would urge you to utilize your voicemail as much as possible.

Topic: Reminders, Notifications

Who am I? What am I supposed to be doing?

- Give me a heads up.



Solution: Give me a heads up. (Reminders and Alarms)

01-Minimum

- Smartphone / voice assistant - really anything that notifies and you pay attention to

02-Premium

- Voice Assistant
- Speakers
- Smart Hub

03-Think About

- What do I or the person I care about needs to remember?
- Do I really need a consistent reminder for this?
- Does everyone else need reminding as well?

04-Skill Level

- Voice Assistant
- Smart Hub
- Speaker
- IFTTT

05-Costs

- Smart Hub - starting at about $60 ; can exceed hundreds
- Speaker - starting at $70 but not much lower end pricing; for a great speaker expect to spend hundreds
- Voice Assistants - Start at $40 (watch for discounts)
- IFTTT - free

NOTE:

This is going to be the most common and most useful tool in the toolbelt. All your notifications will be based to give you information to assure you or indicate you need to do something.

Solution: Give me a heads up. (Reminders and Alarms)

01-Minimum

- A list, hand it to someone, they go get the stuff on the list

02-Premium

- Voice Assistant
- IFTTT
- Shopping Services*
- Button (Custom Coding*)

03-Think About

- Is it worth the additional cost of having items sent to me?
- How do I run my household and get the things I need today?
- Am I ok with people picking out my produce?

04-Skill Level

- Shopping Services
- Voice Assistant
- IFTTT
- Button – Custom Coding

05-Costs

- Voice Assistants - Start at $40 (watch for discounts)
- IFTTT - free
- Button - Custom Coding*

NOTE:

This has been touch and go for us:

- Convenient
- Mistakes and bad product = rework
- Only handful of services * (i.e. - TaskRabbit)
- Higher service cost is saved in gas and time
- Household run as inventory on hand

Mentionables

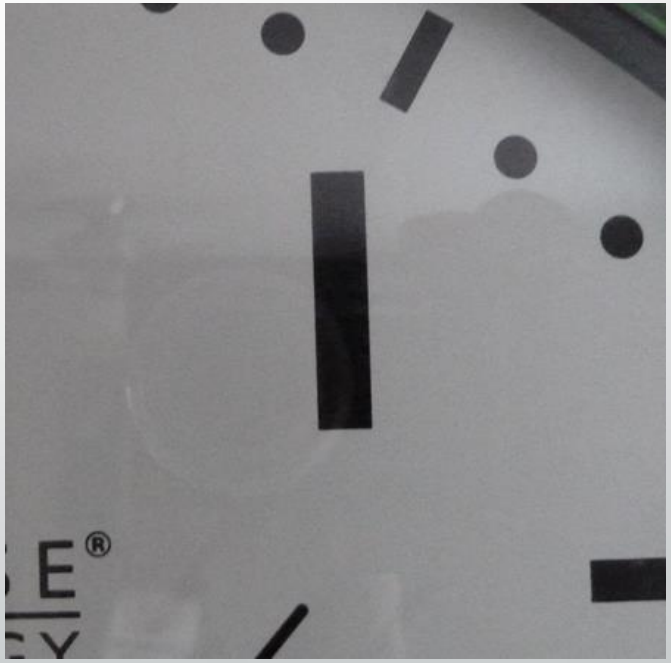
- Loved one falls from bed from time to time.
  - Pressure sensors, light notification, sound notification.
- Monitor nighttime routine.
  - Door sensors, motion sensors, pressure sensors.
- Monitor outside caregiver hours.
  - Google forms, scan-able code, button, custom code.
- Patient scheduling management.
  - Voice assistant, shared Google calendar, Virtual Assistant
- Someone spends too much time on the computer/TV.
  - Sound notification, LED strip lights, smart plugs, …

What we now know:

- **What we are and do**
  - The core objectives are the same; the manner in which we do things varies
- **Components**
  - What are some of the common devices and device types and what their intent is.
- **Home Automation**
  - Discussed definitions, the core ecosystem (what it is and what it typically requires)
- **Capabilities For Solutions**
  - Looked at some real world scenarios, shared some potential solutions along with their difficulties and costs, shared my family's experiences.

One thing left to cover….

- **Working with a care plan**
- How do we think about solutions for daily care?
- Let's work through some together…



Real Examples to Break Down

Every situation in which care is needed is different from case to case. What works for me may not work for you and vice versa.

I asked others on social channels what some of their care plan scenarios were to be able to break down scenarios/conditions I'm not familiar with.

Problem	Goal	Expected Outcome	Tasks to Perform
Stroke has left Dexter's speech impaired.	Improve general communication capability through therapuetic excercises.	Help Dexter improve speech through muscle improvements of tongue and lip control.	1. Tongue excercises a. Stick tongue in/out b. side by side tongue movement c.tongue up and down 2. Pucker lips (kissy face)3. vowel sounds 4. Tonal Scale (Doe, Re, Mi, etc.)
Dexter suffers from high anxiety. When new people provide cares for Dexter, Dexter typically refuses the cares.	To calm Dexter to allow other people providing cares to work with Dexter.	Dexter's anxiety will be at a mangeable state to allow workers to provide cares.	1. Dexter tends to cross arms and look down prior to behavior to anxiety is exhibited - montior for this behavior. 2. Certain sounds soothe the anxiety, like wind chimes. Make noise via the windchimes around the house. 3. Moitor for guarded bahavior to cease and continue cares.
To remain attentitive during Occupational Therapy, Dexter must have no distractions with electronics.	Have Dexter focus on his occupational therapy sessions.	Dexter focuses and activel participates in hit OT sessions.	1. Hide handheld electronics and turn off and unplug all TVs and compters. 2. Start OT. 3. After OT, plug in devices and take handheld devices out of hiding.
Dexter's dogs will need to be monitored to be let back into the house after going outside.	To let Dexter's dogs in for him, in a timely manner.	Dexter's dogs will not be neglected at the door for long periods of time waiting to be let back into the house.	1. Monitor dogs' activity in the backyard

Thank You!

Contact me!

Mark Servais

- https://www.linkedin.com/in/markservais/
- Twitter: @mservais
- YouTube: https://www.youtube.com/user/mservais1
- Email: mark@servaisfamilyllc.com

Where can I continue to learn?

Places to go learn

- Wikipedia:
  - https://en.wikipedia.org/wiki/Category:Home_automation_companies
  - https://en.wikipedia.org/wiki/Index_of_home_automation_articles
- Videos:
  - https://www.youtube.com/playlist?list=PLx4EgzsgdYzoFqjGL7_3F6E23cD8Mcs02 - Danny Winget
  - https://www.youtube.com/channel/UCjMVmzo6abZGVdWjd1mAMnQ/playlists - http://techwithbrett.com/
  - https://www.youtube.com/watch?v=JAT-vUpNIoc - Matt Ferrell goes through some of his smart home functions
- Reddit –
  - https://www.reddit.com/r/homeautomation/ - discussion feed about home automation -
- Twitter
  - https://twitter.com/rHomeAutomation
- Lifehacker
  - https://lifehacker.com/tag/smarthome
  - https://lifehacker.com/tag/home-automation

References

- https://blog.caregiverhomes.com/stateofcaregiving
  - Slides: 2, 4
- https://www.caregiving.org/wp-content/uploads/2015/05/2015_CaregivingintheUS_Final-Report-June-4_WEB.pdf
  - Slides: 2
- https://www.aarp.org/livable-communities/learn/health-wellness/info-12-2012/metlife-study-caregiving-costs-working.html
  - Slides: 2
- https://www.caregiving.org/wp-content/uploads/2012/06/Report-Working-Caregivers-8-22-08.pdf
  - Slides: 3