Technology for Aging in Place

2017 Market Overview

February 2017

Laurie M. Orlov
Principal Analyst
Aging in Place Technology Watch

WHO SHOULD READ THIS REPORT?

This report was most recently revised in February, 2017, updating products, services, websites, and apps. It serves as a market overview with a single purpose: it is intended to describe the need for, and the current market of, offerings to help aging adults live full lives in their homes of choice. As such, it is relevant to:

- Vendors and entrepreneurs marketing to baby boomers and seniors
- Social networking sites targeting baby boomers or seniors
- Advocacy and tech training groups
- Retirement Communities that serve independent adults
- Assisted Living Facilities (ALFs) and Communities represented by Leading Age and Argentum associations
- Senior housing developers
- Home care and home health agencies
- Home health care agencies
- Geriatricians
- Hospitals and integrated service delivery networks
- Government agencies and policy makers
- Geriatric care managers (Aging Life Care)
- Naturally Occurring Retirement Communities (NORCs)
- Startup incubators
- Venture capital and angel investors interested in the boomer/senior market
- Caregivers, seniors, and family members

THE CONTEXT OF AGING – EVERYBODY'S DOING IT, MOSTLY AT HOME

Eighty percent of older adults today live in their own homes – with one-third of the 65+ and more than 46% of the 75+ now living alone.[1] Not surprisingly, the majority of them would like to or may be forced to stay there – and if they move, according to AARP, it will be to another private home.[2] The desire to live at home dominates the minds of the oldest baby boomers who began turning 70 in January, 2016.

"The 70- to 79-year-old age group will increase by more than 50% during the next 10 years and by more than 80% by 2035 – they are the still-influential Woodstock generation." – William Frey, USA Today, January 26, 2016

Within that context, aging in place reflects the desire or ability to successfully age and remain in their home of choice, whether it is a private home, condo, apartment, or less likely, a group setting. This business opportunity is further underpinned by the very recent growth of interest in the mature market – like the $100 million invested in **CC-ABHI** in Canada, the $26 million **Ziegler-Linkage Fund** and $17 million through **Generator Ventures** – not to mention the staggering 2015-2016 $200 million of venture capital investment in tech-enabled home care firms.[3] Why such excitement? Three factors are driving a wave of interest in caregiving, home care and aging in place.

Health costs rise and health policy drives care into the home. As Medicare penalties for hospital readmissions rise, hospitals are looking for ways to better control their destiny in the face of closings.[4] They are providing outpatient clinics and buying rehab facilities (aka skilled nursing facilities, or SNFs). And they are focusing on managing hospital-to-home care transitions. Insurance companies seek ways to lower the cost of readmissions with improved care coordination and care transition programs. Providers are beginning to see Medicare reimbursement for use of telehealth technology, particularly video consultations. And out-of-pocket healthcare spending is on the rise as people age, especially for drugs and end-of-life care.

Stark consumer economic realities prevent moves to senior housing.... Median net worth of the 75+ age range is now $156,000, inclusive of home equity (see **Figure 1)**.[5] This is deferring moves to assisted living – its move-in age now a mid-80's and has become a frailer demographic.[6] But boomers are right behind them – and even less able to move in. They have simply not saved enough – holding an average retirement savings portfolio of only $136,000 – enough for just two years of a private assisted living community like Brookdale.[7] And worse, the average 65-year-old enters retirement years with an unprecedented level of debt **(see Figure 2)**.[8]

…And life expectancy at age 65 still substantial, especially for women. For example, in 2014, the Society of Actuaries updated life expectancy to its highest projected number to date. This is used in pension fund calculations and asserts that women aged 65, on average, can expect to live until they are 88.6; men can expect to live on average to be 86.6.[9] And one in four, according to the Social Security Administration, will live past 90. The combination of financial status and life expectancy raises fears of outliving assets and being unable to afford care.

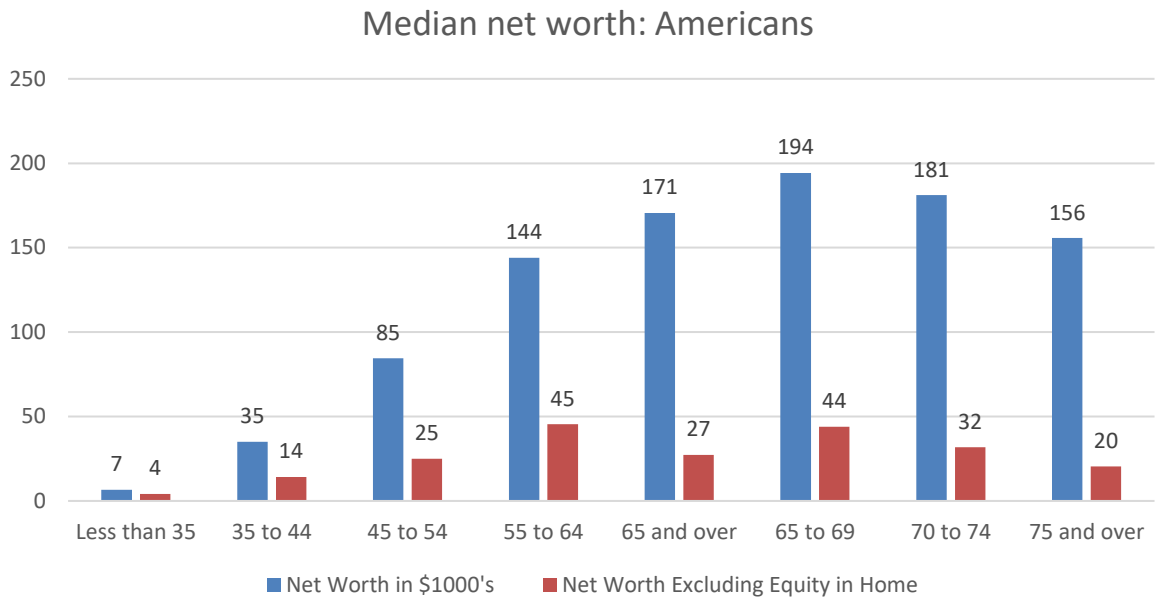

Figure 1 Median Net Worth Source: The Motley Fool, December, 2016 and US Census

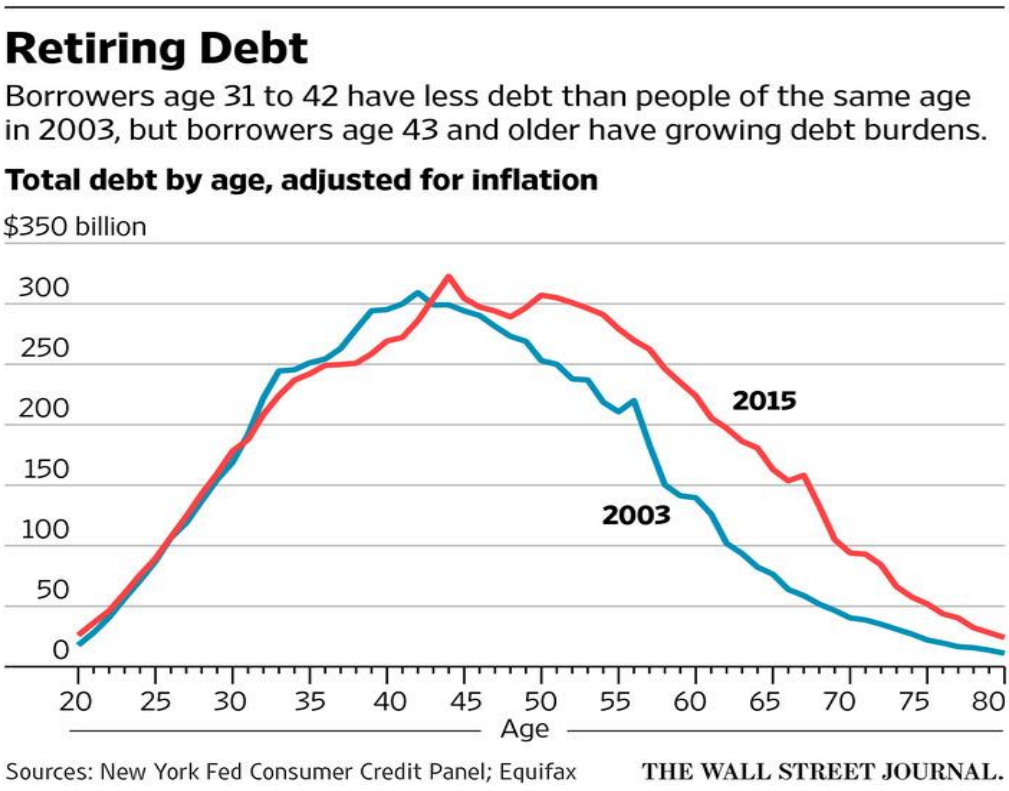

Figure 2 Total debt by age group as of 2015

In 2016 Investors Began to Care More about Tech and Tech-Enabled Care

Besides further cementing consumer commitment to support aging at home, 2016 presented a virtuous cycle of interest, hype, and investment in caregiving, culminating in an unprecedented level of venture capital investment.[10]

Caregiving demands of an aging population create a problem and opportunity. According to AARP's January, 2016 Caregiver Innovation Frontiers Report, 117 million Americans are expected to need assistance of some kind by 2020.[11] However, according to a 2013 AARP policy report, there will simply not be enough family members or even paid workers in the right place at the right time – the caregiver support ratio – to oversee care requirements.[12] And in fact, the gap has already been reached in numerous counties across the US.[13]

Paid home care picks up where families and senior housing leave off. On average, home care fills a care gap of 20-27 hours per week at a lower cost (for families, $18-20/hour) than a move to assisted living. Home care work (or personal care aide) has been one of the fastest growing job categories in the US, according to the Bureau of Labor Statistics, but pay to the worker averages around $10/hour – and for much of the industry, turnover of 40-65% is typical.[14] Further, as wages lag, the demand for workers continues to grow.[15]

Tech-enabled home care startups had received more than $200 million of funding by 2016. Whether it was a coincidence or imitation, three young men formed three different startups in 2015, all funded by Venture Capital investment – **Honor** (San Francisco), **Home Hero** (Los Angeles), and **Hometeam** (New York/New Jersey). So what is the 'tech-enabled' element? In in the case of Hometeam, the tablet, according to the firm, will power the worker with improved background checking, matching, or oversight of the worker, plus better communication to families.[16] Further, during 2016, the **Care.com** marketplace received more than $46 million in investment from Google Capital.[17] Home care software platform provider **ClearCare** received $60 million led by Battery Ventures.[18]

Caregiving apps and initiatives multiply like weeds. Caregivers were surveyed about their views on technology – they express interest but lack time to try it.[19] But in 2016, more caregiving apps emerged, obtained buzz, and received mention or awards at Live Pitches. These included apps for caregivers – like status updates on the well-being of a care recipient. Some -- like **SentinelCall** and **CareAngel --** have automated check-in calls; **Care/Mind** combines a Fitbit wearable to alert to inactivity or decline, or **CareSync,** which recently received $18 million in funding for chronic care management, particularly of Medicare patients.[20] Meanwhile, care auditing startup, **Penrose Senior Care Auditors** was showcased in January at CES 2017.[21] And in October, AARP launched **CareConnection** – a hub for caregiver resources, including telehealth.[22] And in February, 2017, AARP offered a new $10K prize for innovation.[23]

New tech studies encourage new offerings. Surprisingly, according to 2016 research from Deloitte, seniors and baby boomers were surveyed as more likely than younger generations to use sensor technologies than younger generations (See **Figure 3)**. And according to a November, 2016 report from AARP Research, for all 50+ age segments except for the 70+, smartphone ownership passed the 50% mark (see **Figure 4)**.

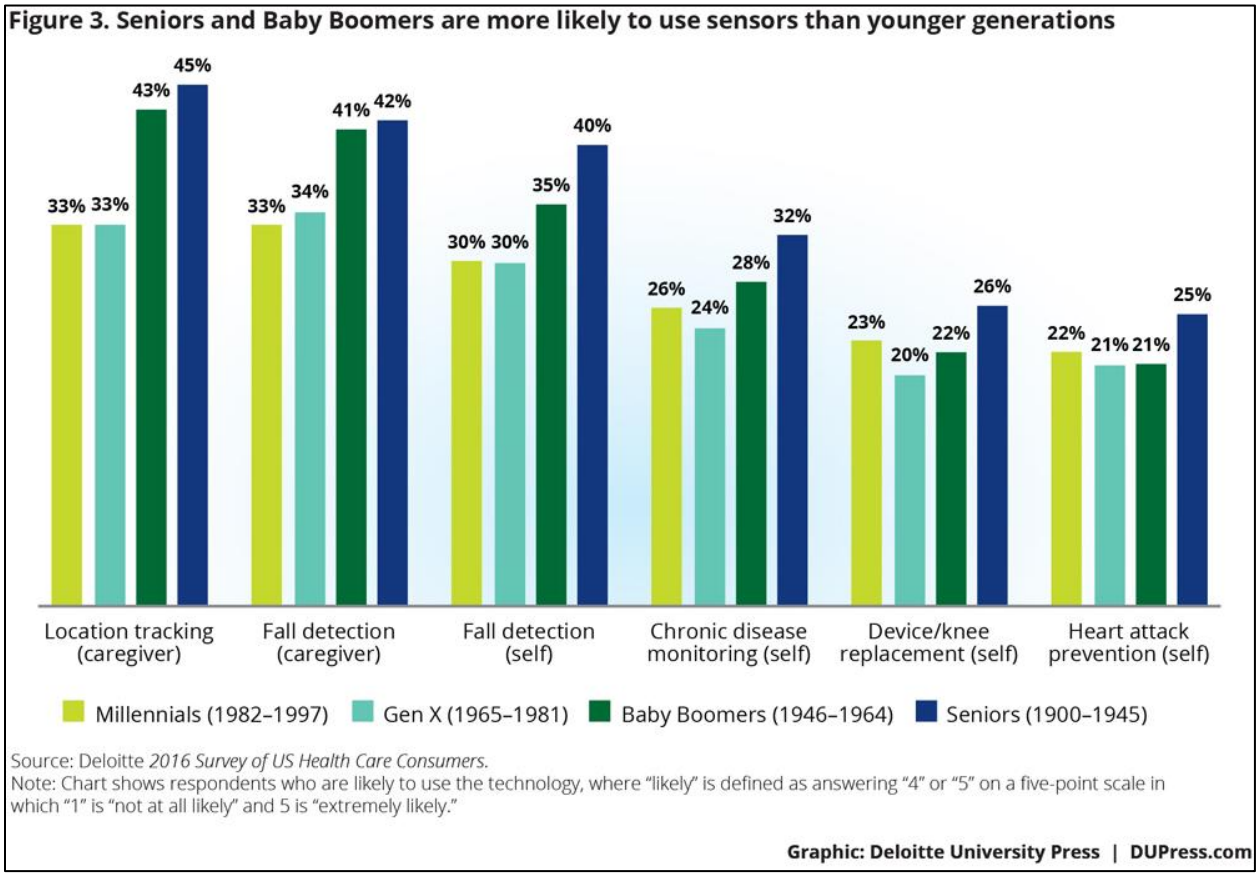

Figure 3 Use of Sensors Source: Deloitte 2016 Survey of Health Care Consumers

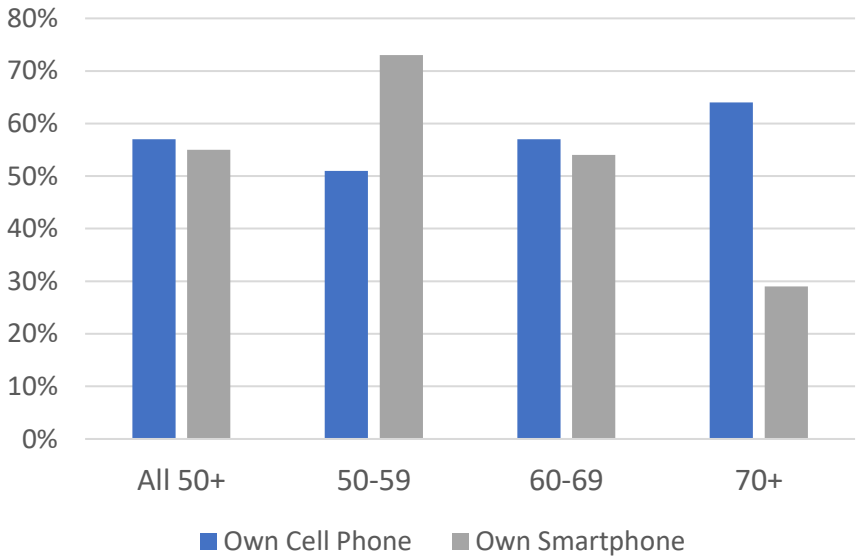

Figure 4 Source: AARP Research Technology Trends, November, 2016

IN 2016, WHAT TECHNOLOGY DID THE REAL SENIORS USE?

Pew Research has long-tracked Internet usage through its Internet and American Life project – the survey has been running for the past 15 years and shows usage of the population aged 75+ -- who in the context of unprecedented longevity – known as the Real Seniors:[24] What happened?

Non-Internet usage dropped from 93% to 50%. What was the context? Over 15 years, browsers and carrier speeds improved – and content on the Web became more valuable. Note that the percentage of non-Internet users aged 75+ has dropped during that period from an nearly-all 93% in 2000 down to 50% in 2015 (see **Figure 4**). What will it take to shrink it further?

Cost of Internet service is still high. In 2000, Internet Service Plans (ISPs) cost around $20/month.[25] Today at an average cost of $60/month, in-home Internet access, while faster and more reliable than in 2000, is out of reach to the elderly on fixed incomes.

Age 75+ non-Internet use since 2000

Year	Percent	Base Count
2016	55%	493
2015	50%	757
2014	57%	624
2013	60%	1,392
2012	62%	2,315
2011	65%	804
2010	71%	1,873
2009	71%	1,033
2008	74%	1,762
2007	77%	1,304
2006	78%	1,739
2005	82%	1,450
2004	88%	1,127
2003	88%	1,157
2002	89%	1,482
2001	93%	1,370
2000	93%	2,771

Figure 5 Source: Pew Research Internet & American Life Survey, 2017

Smartphone adoption is still limited. Smartphones are becoming larger and their use has supplanted tablets and PCs. But only 29% of those aged 70+ own a smartphone according to a new AARP study – and only 4% in that age range intend to purchase one (See **Figure 5)**.[26]

TECHNOLOGY UNDERPINS, DOES NOT REPLACE SERVICE OR FAMILY ROLES

The categories of technology offerings required to age successfully are comprised of four market segments – each useful in itself, but together, they provide a completed puzzle of maintaining connections, safety, health, and a more fulfilling and interactive life as we age. Further, these categories should be considered with the role of caregivers as an overlay (see **Figure 6)**:

Communication and engagement. For baby boomers and younger, life is unthinkable without e-mail, chat, web surfing, Facebook, Smartphones, video games, Skype, and texting. Yet the majority of seniors age 75+ may be less familiar with these ways to be in touch and in the know.[27] Many find their devices too complex, in constant need of patches and upgrades – and they rightly worry about data security and protecting themselves from fraud and identity theft. Simplified tech (for aged 75+) can provide modified interfaces – note **Breezie** and **grandPad.** Larger, brighter and faster smartphones will eventually replace today's general purpose tablets.[28] Voice-enabled interfaces (like the **Amazon Echo** or **Google Home**) can raise the bar on in-home social experiences.[29] And **Hasbro's JoyforAll Pets** play a companionship role for the elderly.[30]

Safety and security. The ability to remain at home depends on whether the home is free from obstacles and dangers – and how risks are addressed. Beyond retrofitting the home and activating home alarm systems to ensure privacy, seniors will be served by smart home sensors (IoT) and PERS vendors that get monthly fees from PERS and call center businesses. The market for mobile PERS services continues to grow – and expected within the industry to be more than half of the North American PERS market by 2019.[31] Device firms include **Philips, MobileHelp,** and **Nortek/Numera**. Wearables that include health-related sensors began to take the stage in 2016-17, including the **Lively Wearable**, **CarePredict Tempo**, and **UnaliWear**.

Health and wellness. The risks associated with obesity and lack of exercise only worsen with age. In this year's list: **Medisafe** and **PillDrill** for medication adherence, and **Livongo** for diabetes. But some technologies have undergone public questioning – **Fitbit** become the target of a class action suit in January.[32] And the **Lumosity** cognitive fitness claims were questioned by the FTC.[33] Online weight loss tools have proven popular, though the market for fitness wearables is growing more slowly.[34] For chronic disease management, device firms like **Medtronic** or **AliveCor** offer tools to tracking diabetes or congestive heart failure. On the other hand, studies about remote patient monitoring technology have indicated little difference in outcomes.[35]

Learning and contribution. In 2006, Joseph Coughlin of MIT's AgeLab applied "Maslow's Hierarchy of Needs" to Aging in Place.[36] This seminal document noted that once the basic needs of communication, safety, and health are addressed, people have both the need and capacity to continue to learn, stay active in and knowledgeable about society, contribute to it through volunteering and continued work, leaving a legacy of stories (not just money) for those who love them. Seniors can sort among online programs and auditable courses found through sites like **SeniorNet.org, AARP TEK, or OATS.org.**[37] Due to the growing percentage (one in five) of workers aged 65+, some of the offerings have been realigned to help an older person obtain technology skills that can prepare them to find a job.[38]

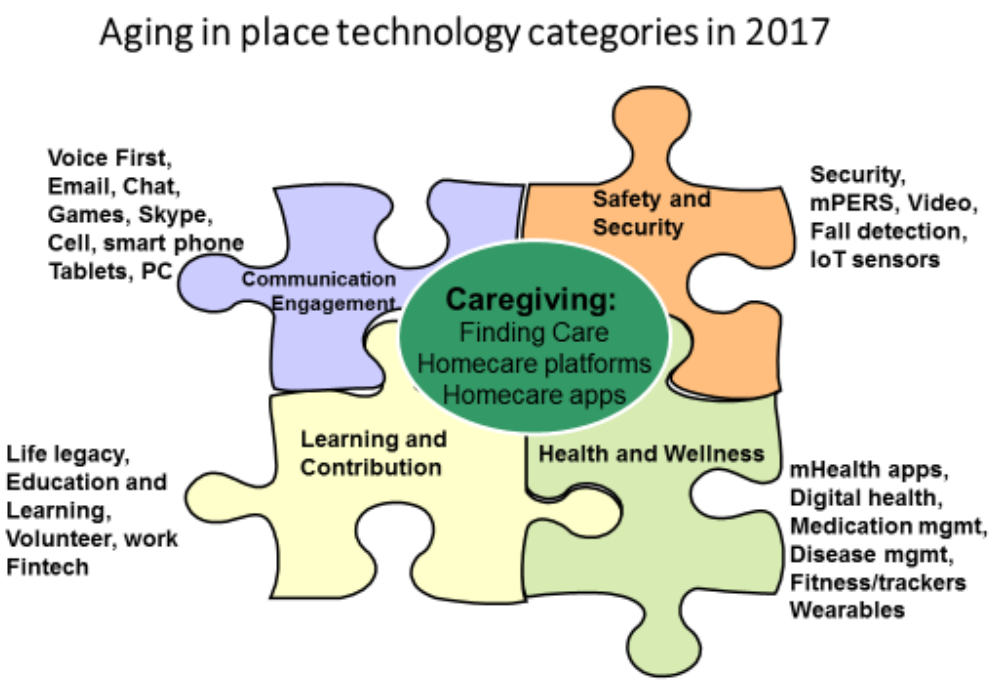

Figure 6 Technology categories with caregiving overlay

How Is A Complex Market Best Served and Actually Reached?

As this 2016 Pew Survey shows, 41% of the 65+ market is not online (see **Figure 7)**. If that population were the target market user of a technology or service, Facebook, Google and Twitter may not be the way to get their attention. Instead, new entrants must form partnership early – at the pilot stage, with channels that understand the market and can resell, refer, recommend. And the caregivers of older adults are a largely untapped market – the Parks report projected a "$72 billion market opportunity by 2020, a growth of 13% from 2016." As caregivers, professionals, and families seek alternatives to help better serve older adults at home, what are the requirements for making technologies useful and reaching the intended market?

Technologies must be well-supported and intuitive. Most people have a laundry list of frustrations with technology. The AARP/Catalyst Fitness tracker survey of people aged 65+ revealed that packaging and device purpose must be (and was not) intuitive.[39] The 2015 failure of Lively's direct-to-consumer approach further underscores the fallacy of inventor-centric thinking that if we create it, they will buy.[40] Remote configuration and support partners must be a major part of the offering – or doom the user and family to frustration and the product to failure. As the 2014 AARP report, **Challenging Innovators**, noted, focus groups and home trials can reveal greater technology resistance than approaches that ship first, learn later.[41]

Device vendors must be capable of integration and extension. Despite standards initiatives like the Continua Health Alliance, many of today's gadgets still don't communicate – into or out of the home, but especially with each other. So mobile Health devices, apps or medication reminders are useful, but touch a tiny aspect of the whole person. To provide valuable integrated solutions, device software must create and use common standards to communicate to caregivers and providers and feed analytics and decision tools.

Costs to consumers must be affordable. As tech becomes more usable and useful, consumers will look for ways to acquire it. This may occur through payers, but for older age groups, it is more likely through adult children and family. Higher income consumers will come to realize that in-home bandwidth for their aging parents enable Skype, voice-first tech like Amazon Echo, as well as chronic disease monitors that provide value. These will be viewed as just as essential as the cell phone plans, GPS services, cable TV and many other monthly fees that are now part of their technology vocabulary.

Upgrades must be more seamless than today. Consumers already gravitate towards applications that work with ones they already use, including Gmail, Facebook, FaceTime, YouTube or Skype – regardless of device. In the future, let's hope for upgrade processes less painful than today's 'No Going Back, You Must Upgrade or Else!' style. Tech vendors will make it easier to use personalized user interfaces (like Amazon and Netflix) that are recognizable across devices, coined in an AARP report as **Design for All**.[42] And a single device like a tablet, smart phone or TV will drive interaction and content, and other devices in the home will simply act as displays.

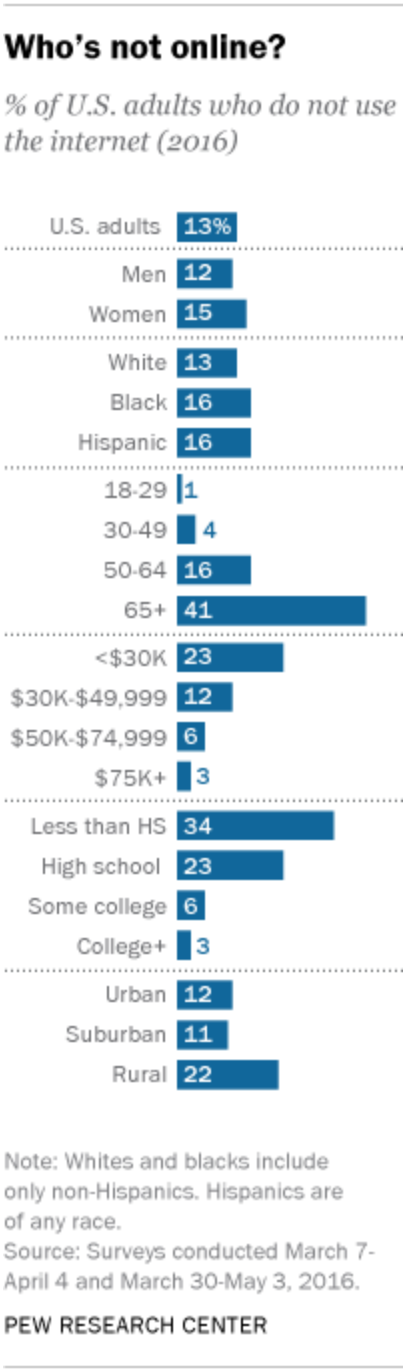

Figure 7 Who is not online?

COMPETING PLATFORMS FOR AGING IN PLACE TECHNOLOGY

Technology platform alternatives are narrowing in 2016 as:

Smartphone apps multiply – and disappear. In today's market, expect wireless devices to augment or serve both in-home and out-and-about needs. Good market penetration and simple operation is attractive, especially for reminders, alerts, simple Internet search, texting, and even GPS location applications. For baby boomers and their smart phones and tablets, health and safety apps are multiplying for the iPhone via iTunes store – not to mention Samsung Health and Apple's iOS Health.[43]

Wearables become popular -- but not ubiquitous. Meanwhile wearables like **Fitbit, Wisewear** and **Unaliwear** emergency jewelry, or any of a myriad of PERS offerings will penetrate the older adult market.[44] Wearables are already in use by boomers and seniors.[45] But forecasts have been slashed to match their slower-than-anticipated adoption (See **Figure 8)**.[46] Recognizing that combinations of capabilities are becoming more relevant to older adults and families, by 2019, most PERS resellers will offer more subtle mobile devices, including bands and watches, that combine the transactional PERS activity with predictive analytics – helping to prevent future injury and penalties from re-hospitalization.

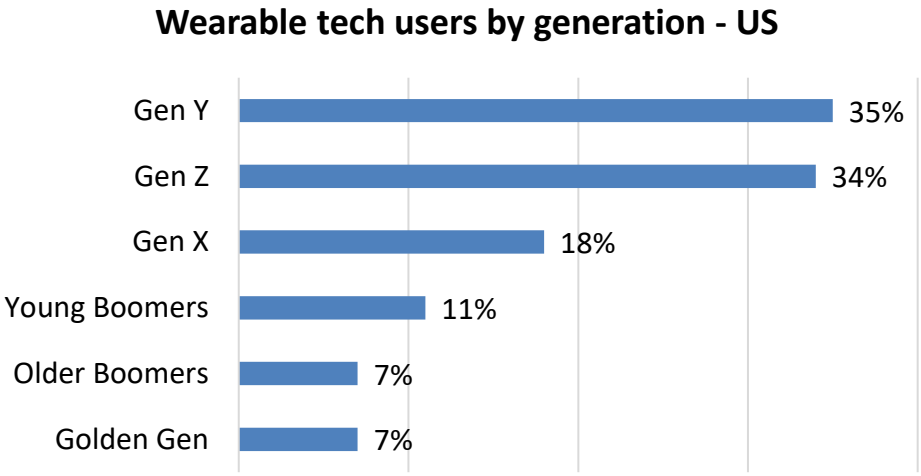

Figure 8 Source: Forrester Research, 2015- 2016

Computer- smartphone- and tablet-based links to the cloud dwindle. The PC, iPad and Android tablets – with unfettered access to the Internet and multiple app formats – offer the broadest device access to help seniors in their homes, whether it's searching for health information from **Mayo Clinic**, home retrofitting tips from **AARP**, or caregiving tips from **Caring.com**. However, outside of the home their use will increasingly be supplanted by ever-larger (and very portable) smartphones. The closing of physical locations like Social Security offices or bank branches should accelerate urgency of helping offline seniors to move online. Seniors and their families should be cautious, however, as 2016 also turned out to be the worst year yet for identity theft, credit card fraud, and wide variety of scams.[47]

ADVICE TO VENDORS NOW: IT'S TECH-ENABLED SERVICES, NOT PRODUCTS

Probably the biggest issue that keeps more of today's technology out of the homes of seniors is the difficulty of marketing to both them ("We are not old!") and to their afraid-to-interfere adult children, while selling through knowledgeable channels, appropriate websites AND pricing right for resale and white labeling. Vendors must find:

The right customer – baby boomers and their roles. Direct-to-consumer marketing of products and services takes deep pockets for just the advertising**.** Sometimes to find the field testers and/or early validation of concept they need, companies turn to Kickstarter and Indiegogo for visibility. For example, **GreatCall** did that with an Indiegogo campaign intended to surface possible field testers for its new Lively Wearable.[48]

Access to ongoing training and refreshers. To be sure, the oldest are likely to approach smartphones as another variation of feature phone – until they learn about their use, whether in the store, online, from their family, or in training centers in their communities. But even then, automatic updates and application software changes will push users back to the store or family for refreshers or create considerable frustration. Despite the efforts of senior centers and other national organizations like AARP, training services today will continue to fall behind in confronting the rapid pace of change of devices and the growing threats, including geolocation hackers, targeting the safety and identity of the user.

The real need – can be a service problem solved. Despite market hype, seniors and their adult children will not imagine on their own what to do with sensor networks, web cams, or set top boxes. Someone with expertise needs to be able explain the benefits, for example, of care coordination, when selling to a home health agency. Instead of offering point products out of context, vendors should fit solution descriptions, service provider stories, and senior support processes along the continuum of needed care. This necessitates a thorough grasp of the decision points that spike need and interest (see **Figure 9)**.

Identify the right channel – it's about an ecosystem and indirect selling. The right channel depends on the complexity of the product and the target user. And less is more – remembering that 20% of channel partners typically contribute 80% of revenues. Channel utilization should primarily be indirect – resellers offer reach extension, configuration or geography-specific service needs. For example, PERS vendors may market through multiple regional service providers, but the price can vary for local markets. Others will gravitate to a larger and branded ecosystem enhanced with white-labeled offerings for home care agencies, pharmacies, senior housing organizations or insurance partnerships.

Partnerships matter – as announcement-ware. Fresh announcements of partnerships are indicators of forward business motion. For example, in the past year, announcements of transportation partnerships to help older adults sprouted like weeds – we may not see an announcement if they are weeded out. A few examples: **GreatCall-Lyft**, **UberAssis**t with **RideWith24** and **AgeWell** (Canada), Lyft and **CareLinx**, Uber with medical transport firm **Circulation**. Success of these is impossible to measure and dissolution of partnerships (and companies) are rarely announced.

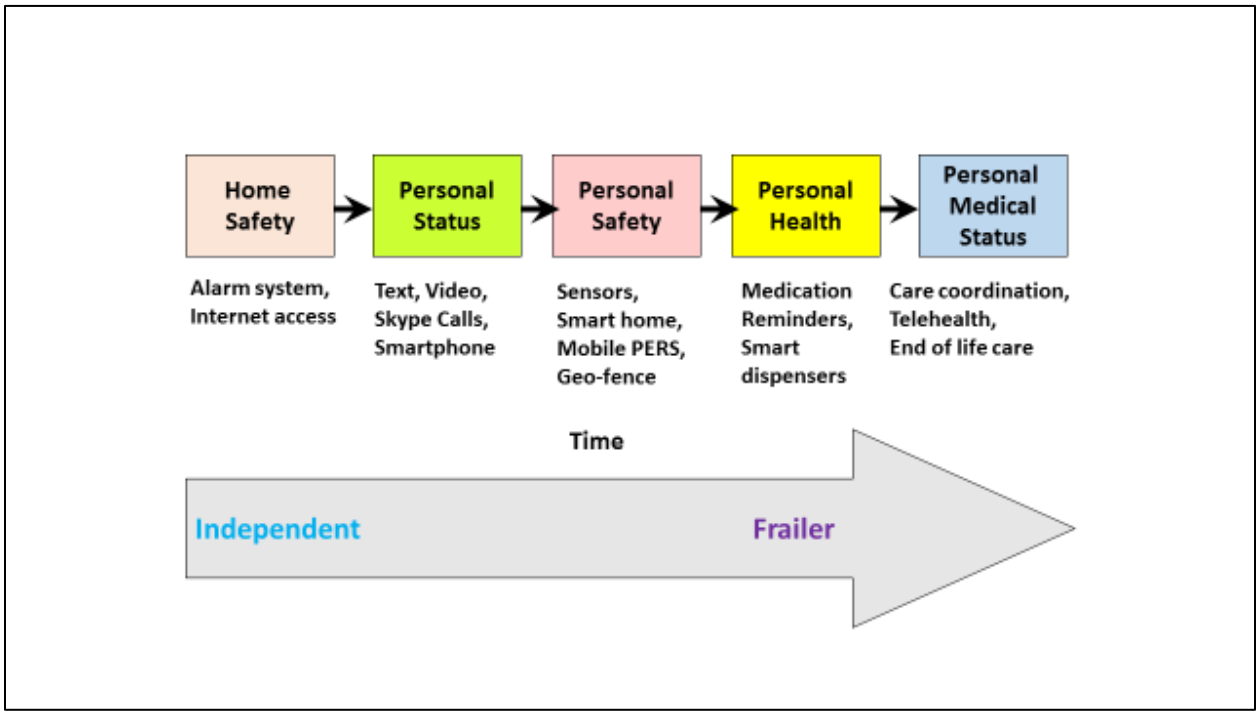

Figure 9 Technology needs over adults evolve over time

HOW DOES THE AGING IN PLACE TECHNOLOGY MARKET EVOLVE?

The marketplace of products and services today is still fragmented, with ever-shifting cottage industries comprised largely of startups, challenged by channel complexity and end user resistance. But with fragments assembled into an overall puzzle, this business for boomers and beyond has been estimated by some to grow to $20 billion by 2020 or even $30 billion by 2017.[49] The larger market will be based on growing boomer awareness and aging. It will be strikingly different from today – fueled the growing availability of in-car technology, mobile PERS health integration, wearable fitness and health devices, in-home 'Voice First' IoT hubs and smart phone apps. And by 2020, the broader technology market will support software-based customizations and voice first interfaces for everyone, regardless of age: [50]

What are the key trends to watch in 2017?

As 2017 began, a number of trends that became apparent in 2015 and 2016 showed staying power into 2016 and likely beyond – experts interviewed agreed that (see **Figure 10**):

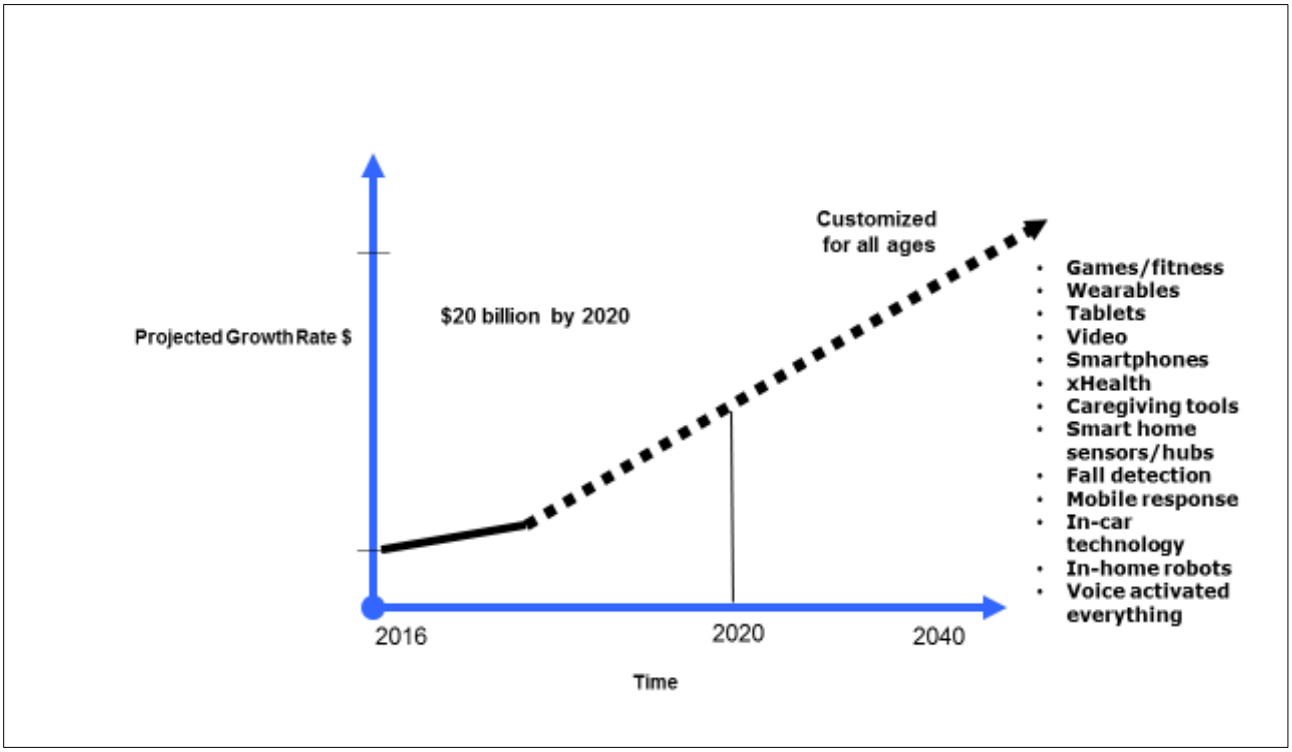

Figure 10 In 2017 where was the market headed?

Voice-first interfaces will dominate apps and devices. We are still downloading apps, that era may end. Instead we will be experimenting with personal assistants or AI-enabled voice first technologies (Siri, Google Home, Amazon Alexa, Cortana) which can act as mini service provider interfaces – find an appointment, a ride, song, a restaurant, a hotel, an airplane seat. Technology survivors may be voice-inappropriate tools for social networking, mapping, camera, and news. And there are a continuing wave of behavior modification apps, which currently seem to come and go with the tides of marketing hype – stop smoking, get moving, avoid too much sun, drink more water. Maybe your doctor will prescribe an app – many Silicon Valley startups folk believe (or hope) this will happen – but doctors are not quite convinced.[51]

Internet of Things (IoT) replaces sensor-based categories. The sensor-based home monitoring market that crested in 2008 was an early example of the possibilities that evolved later. Nearly a decade later, small sensors and tags, as well as the hubs that can detect and monitor them are becoming mainstream. This Internet of (smarter) Things, or IoT, encompasses stick-on tags that transmit location, smart devices like wall plugs, thermostats, light bulbs, and even pet feeders. These can be managed through configurable home hubs like **Google Home** and **Amazon Echo.** Will these voice-first hubs can be their own home control ecosystems?

Niche hardware will fade away – **long live software and training.** In 2017, will senior-focused hardware survive accelerating technology change? Yes, if it mitigates a health-related condition (hearing, dexterity or vision loss). Otherwise, we will see software that will make hardware platform choices hidden or irrelevant. Will senior phones and tablets survive or will seniors choose custom or assistive configurations on a standard phone? And will tablets (even

ones for seniors) be swept aside by ever-larger smartphones? Some will buy specialty devices like **grandPad** or **Breezie**, but most seniors will be trained to use standard tablets or more likely learn about their smartphones in the store or at workshops for standard off-the-shelf products.[52]

Tech-enabled home care pressures traditional homecare providers – or does it? Can $200 million of VC investment be wrong – or premature? 2015 saw investors begin a swoon for tech-enabled home care providers.[53] Then in January, 2016, AARP/Parks Associates sized the caregiving innovation frontier at $279 billion.[54]The fact that these occurred within a single year will push self-scrutiny within the home care agencies and franchises, those that rely mostly on people to do background checking, staff to match need with worker, and managers to track work. These other successful home care providers may wonder and fret – is 2017 the year they must offer 'tech-enabled' care? What exactly is tech-enabled care? And what will it be in the future? [55]

"Health Tech" replaces "Digital Health," begins acknowledging aging. In a recent MobiHealth News webinar, founder Brian Dolan observed that Digital Health as a category was being replaced in 2016 and beyond with the term Health Tech. This sensible change reflects the disappearance of some investment money for the mHealth, cHealth (for Connected) and the other 'xHealths' in favor of institutional technology (and budgets) for hospital/health systems, medical practices, and related IT departments. Note that HIMSS does have a Long-term Care Roundtable that focuses on IT for the post-acute and possibly tech-enabled world of Medicare patients.[56]

Robotics and virtual reality will continue -- as experiments. The press loves to write about robots and seniors (see Brookdale).[57] Still at the anecdote stage, widespread use of care-related robots in the home or in senior living communities hasn't happened. Instead, robotic (pets are growing in popularity in senior communities and private homes – no care and feeding required, plus the possibility of a comfort to seniors who feel isolated or may have dementia.[58] During 2016, virtual reality experiences entered the experiment ring of another Brookdale senior living via an MIT startup that plans to charge a subscription fee for usage.[59]

LOOKING AHEAD TO 2017 AND BEYOND

An ecosystem of services evolves to help aging boomers and beyond. Aging-related service silos detect overlap (home design, healthcare, services). In the future, hubs like AARP's **CareConnection** may provide associations and/or convergence of aging-related product categories. Service-based providers will need to – like assisted living, nursing homes, financial services, and home care all serve seniors, but in different and generally unintegrated ways. Home care and geriatric care management (now called Aging Life Care) groups are accelerating their pace in discovering and deploying technology that could help family members know what's happening with loved ones – as noted in the recently published Tech-Enabled Home Care 2017. The home automation (aka Internet of Things or IoT), custom installer and security markets have tech expertise and sees an opportunity as aging in place/home health enablers within the Tech-Enabled Service Ecosystem (see **Figure 11).**

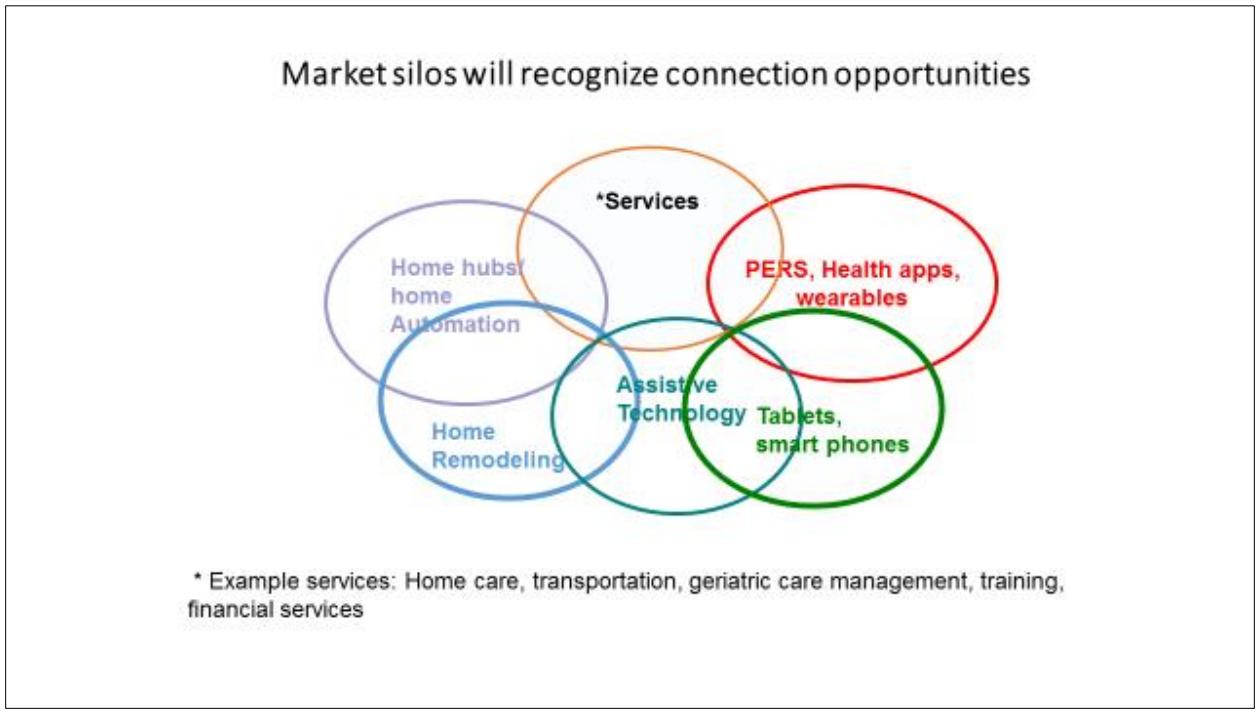

Figure 11 Services will expand and cross-sell

New developments and remodels will incorporate aging-in-place technologies. Some new higher end senior housing developers are pre-wiring housing with broadband, security monitors, tablets and motion sensors – in addition to wall backing for grab bars, standard wide doorways, and alternative kitchen counter heights. As boomer housing needs grow, other senior housing options will be upgraded or retrofitted with must-have tech lists. Boomers who will remain in their homes expect home networks, web cameras, and voice-activated security for personalized emergency response – and vendors will leverage these to sell them more sophisticated and connected applications. To reduce energy use, building codes will mandate environmental sensors, users will expect smartphone-controlled reset of temperature as the home is entered or exited. Automatically lit paths from bed to bath will be enabled with inexpensive nightlights.

Standalone offerings will be acquired or disappear. To date one-off innovations produced by well-meaning people ("I designed this for my grandmother") generate press attention, some customers, and typically disappear. Moving forward these will be replaced with integrated lower-cost solutions. Unique functionality may garner adoption by the most technically adept seniors. But for the majority of the aging population, a consistent underlying platform that is designed for all, not simply for the elderly, will be preferred – and channels of distribution that interact with them will be the preferred sources. Professional caregivers and health providers will begin to use smoothly connected tablet-PC-smart phone platforms to gain visibility, propelling solutions into mainstream use. Local integrators, drawn from ex-IT workers, security companies, senior housing, electronics dealers, or remodelers or home care, are the right players to travel the last few feet into the home.

Predictive analytics will become part of the new health product introduction lexicon. For technologies that track health, activity, behaviors, emotional status, or any other indicators of wellbeing, offerings will offer to retain **opt-in** information in their own cloud data or that of a partner (like an insurer or healthcare provider). As accuracy of these devices and technologies improves, it will be necessary but insufficient to note that an activity has occurred without placing it in the context of a history signaling improvement or decline.

###

About the Author:

Laurie M. Orlov, a tech industry veteran, writer, speaker and elder care advocate, is the founder of **Aging in Place Technology Watch,** a market research consultancy that provides thought leadership, analysis and guidance about technologies and related services that enable boomers and seniors to remain longer in their home of choice. In addition to her technology background and years as a technology industry analyst, Laurie was a certified long-term care ombudsman and received a graduate certificate in geriatric care management from the University of Florida.

In her previous career in the technology industry, Laurie held senior positions in IT organizations, followed by 9 years as a leading industry analyst at Forrester Research. While there, she was often the first in the industry to identify technology trends and management strategies. She has spoken regularly and delivered keynote speeches at forums, industry consortia, conferences, and symposia, most recently on the business of technology for boomers and seniors. She advises large organizations as well as non-profits and entrepreneurs about trends and opportunities in the age-related technology market and was a participating expert on the Think Tank for The Philips Center for Health and Well-Being, as well as testifying before the US Senate in 2015 on the role of technology for aging in place. Her perspectives have been quoted in Business Week, Forbes, Kiplinger, the New York Times, and the Wall Street Journal. She has a graduate certificate in Geriatric Care Management from the University of Florida and a BA in Music from the University of Rochester. Her other research reports include **Next Generation Response Systems (2013), Challenging Innovators to Design for the 50+ (2014),** and **Baby Steps: Will Boomers Buy Into Mobile Health? (2015)** as well as the annually updated **Technology for Aging in Place Market Overview (2016)** and **Tech-Enabled Home Care (2017).**

Aging in Place 2016 Technology Categories and Vendors (Example only vendors)

For inclusion as an example-only technology to facilitate aging in place, the vendor meets two of these criteria (those firms listed are only examples, not an exhaustive list). Because of the wave of relevant technology announcements during 2016, more startups, including pre-launch, are included than previous versions. In addition, please note that ** entries are new for this publication of the 2017 Market Overview, though they may have been in business prior to its publication. The criteria:

a) Incorporate messaging to and about boomers and/or seniors – or their family or professional caregivers.
b) Is expected to be eventually available across the US, not just in a single region.
c) Addresses one or more categories described in this document.

Category	Sub-category	Purpose	Platform	Contact
Communication and Engagement	Newly released shown with **			
*Amazon Dot***	Cloud-based voice service (Amazon)	Portable Voice-enabled AI access	Appliance	Amazon.com/echo
*Google Home***	Cloud-based voice service (Google)	Voice-enabled AI access to music, reminders, web	Appliance	Google.com/home
GreatCall Jitterbug Touch3	Smart phone	Added services	Android	GreatCall.com
ReSound LiNX	Hearing	Link hearing aid to phone	iPhone	ReSound.com
Breezie	Senior Boomer tablet	7. in, multi-touch	Tablet app	Breezie.com
*Rendever***	Virtual Reality	Experience Headset	Wearable	Rendever.com
grandPad	Senior tablet	7 in, LTE in USA	Tablet	grandpad.net
*ViewClix***	Smart Picture Frame	Video and Picture	Device	ViewClix.com
*Clarity TV Listener***	Bluetooth wireless headphones	18 hours of battery	Device	ClarityLifeProducts.com
*Independa AnyTV Companion***	TV-based communication	Communicate with older adult	Smart TV	Independa.com
*Hasbro JoyForAll Pets***	Cat and dog that can interact	Reacts and responds to touch	Toy	JoyforallPets.com
Home Safety and Security				
Philips CareSage	Predictive Analytics	Combines PERS/Health Status to predict fall risk	Pendant/ analytics	lifelinesys.com
*GreatCall Healthsense***	Sensor monitoring	In-home, senior living	IoT	Healthsense.com
GreatCall Lively Wearable	PERS	Safety wearable	Safety	mylively.com
UnaliWear	PERS, health	Voice-activated Wearable	Safety	Unaliwear.com
*Freeus Belle***	3G Mobile PERS	Waterproof, 2-way voice	Pendant	Freeus.com
Wisewear	Health	Jewelry with emergency alerting	Safety wearable	WiseWear.com
MobileHelp Fall Button	mobile PERS	Includes Honeywell health partnership	Wearable with service	MobileHelp.com
EverThere Wellness	Predictive Analytics	Nortek/Numera PERS with activity tracking	Pendant/ analytics	Numera.com
*Chipolo Tracker***	Tracking tag	Item Tracker w/sound	IoT	https://chipolo.net/
BioSensics	Safety, health	Gait analysis	Multiple sensors	Biosensics.com

Category	Sub-category	Purpose	Platform	Contact
Independa AnyTV Companion	Safety, health	Remote monitoring	Monitor platform	Independa.com
EarlySense	Bed exit, vital signs	Predictive Analytics	Sensors	EarlySense.com
Essence Care @ Home	Smart home, emergency	Telecare Platform	Monitor platform	Essence.com
*EverSafe***	Smartphone Safety App	Safety app	FinTech	EverSafe.com
Health and Wellness				
*Cardiocomm HeartCheck***	Mobile Health	Mobile ECG	Appliance	HeartCheck.com
*Orbita Health***	Voice-enabled	For home care agencies	Appliance	OrbitaHealth
*PilDrilll***	Medication dispensing	For home use	Appliance	Pilldrill.com
*IKeyp***	Medication dispensing	Personal Safe for Medications	Smartphone App	IKeyp.com
	Hydration band	Tracks too little/too much hydration	Wearable	Nobo.io
*Livongo***	App for diabetes and pre-diabetes	Portal plus app	Integrates trackers	Livongo
PillPack	Pharmacy service	Customized reorder		Pillpack.com
*MioLink***	Simple fitness tracking device	Wearable on wrist	Smartphone app	MIoLink
MedMinder with PillsandBeyond	Medication management	Consumer	Prefilled Pillbox Internet	Medminder.com
	Medication adherence	Pharma-consumer	Appliance	Adheretech.com
MediSafe	Medication management	Consumer	Appliance	Medisafe.com
MedFolio Wireless pillbox	Medication dispenser	Consumer, dispensing	Appliance	Medfoliopillbox.com
Learning and Contribution				
AARP TEK	Train on tech tools for home, work	Regional classes	In-person, online	AARP Tek
Grandparents.com	Portal	Discounts	Internet	Grandparents.com
Stage of Life/Grandparents	Portal	Discounts	Internet	Stageoflife.com

Category	Sub-category	Purpose	Platform	Contact
After Steps	End of life documents	Checklist and doc storage	Internet	Aftersteps.com
Ancestry	Legacy	Family tree, history	Internet	Ancestry.com
LifeBio	Legacy	Produce a book based on template	Internet	Lifebio.com
MyHeritage	Legacy	Family tree, history	iOs, Android	MyHeritage.com
FirstStreet Online	Product Catalog	Multiple products	Internet	Firststreetonline.com
CourseTalk	Directory	MOOC reviews/ranking	Internet	Coursetalk.org
SeniorNet.org	Education and Learning	Technology training	Internet	Seniornet.org
Encore.org	Education and Learning	Resource to tap skills of mid-life and beyond	Network of resources	Encore.org
RetiredBrains.com	Education and Learning	Directory of online courses	Internet	Retiredbrains.com
Bluehair Technology Group	Education and Learning	Senior technology training		Bluehairtech.org
OATS (Older Adult Technology Services)	Education and Learning	Senior Planet Technology Center in NYC	Center/Service	Oats.org
Home Care/ Caregiving Tools				
CareLinx	Find non-agency home care	Family caregivers find/employ caregivers	Portal, directory	CareLinx.com
*Envoy***	Find home care and services	Home care with staff/family tablet/phone	Tech enabled home care	Helloenvoy.com
*Carejoy***	Care plan, find care	For caregivers	Portal	Carejoy.com
Caring.com	Caregiver portal and directory	Family caregivers	Portal, directory	Caring.com
Care.com	Caregiver portal and director	Find care	Portal, directory	Care.com
*Penrose Senior Care Auditors***	Monitor senior and home care	Monitoring, check-in service	Monitor senior service work	Penrose Senior Auditors
ClearCare Online	Care management	For care professionals	Manage work	ClearCareOnline.com
Caremerge	Care management	For care professionals	Manage work	CareMerge.com
CareSync	Care coordination	Chronic Care Management	Includes concierge svc	Caresync.com
CareTreeMe	Home Care Management system	For care professionals	Manage work	Caretree.me
eCaring	Home care Management	For care professionals	Manage work	eCaring.com
Hometeam	Home care Management	Home care Marketplace	Find, manage work	Hometeam.com

Category	Sub-category	Purpose	Platform	Contact
PointClickCare	Home care Management	For care professionals	Manage work	PointClickCare
Caregiving apps				
CareAngel	Caregiving app	Virtual caregiving assistant (IVR)	App	Careangel.com
*LifePod***	Virtual Companion	Voice Reminders	Amazon Alexa	LifePodNet
Clevermind	Alzheimer's	Consumer, Alzheimer's	iPad	myclevermind.com
*SentinelCALL***	Caregiving app	Virtual caregiving assistant	Paid	SentinelCALL.com
Healthspek PHR	Personal health record	Opt-in sharing health info with doctors	iPad with iPhone viewer	Healthspek.com
Comfort Zone Check-in	Track Cell phone or wearable device	Alzheimer's Association	iPad, iPhone	Alz.org
Care Partners Mobile	Task organizer	Shared calendar	Multi-device	lifelinesys.com
Care/Mind	Care recipient activity	Status & Alerts	Fitbit compatible	Reassureanalytics.com
Personal Caregiver	Caregiver coordination	Medication & refill reminders	iTunes	Personalcaregiver.com
MedCoach	Health and Wellness	GreatCall	Android	GreatCall.com
SingFit for Seniors	Engagement	Music care recipients	iTunes	Singfit.com
CareZone Senior	Care Coordination	Share tasks, manage meds	Android	Carezone.com

References:

[1] http://www.aoa.acl.gov/aging_statistics/profile/2014/2.aspx

[2] http://www.aarp.org/home-garden/livable-communities/info-11-2010/home-community-services-10.html

[3] https://www.ageinplacetech.com/page/tech-enabled-home-care-rising-worker-scarcity-family-expectations

[4]http://www.beckershospitalreview.com/finance/21-hospital-closures-in-2016.html

[5] http://www.fool.com/investing/general/2015/05/17/americans-average-net-worth-by-age-how-do-you-comp.aspx

[6]http://www.aoa.acl.gov/aging_statistics/profile/2014/2.aspx

[7] http://www.fool.com/investing/general/2016/02/09/why-brookdale-senior-living-inc-shares-are-tumblin.aspx

[8] http://www.wsj.com/articles/new-york-fed-finds-large-increase-in-debts-held-by-those-over-age-50-1455289257

[9] http://www.wsj.com/articles/rising-u-s-lifespans-spell-likely-pain-for-pension-funds-1414430683

[10] http://www.forbes.com/sites/valleyvoices/2016/11/21/why-vcs-care-more-about-home-care/#3f8b2f2a4d16

[11] http://www.aarp.org/content/dam/aarp/home-and-family/personal-technology/2016-01/2016-Caregiving-Innovation-Frontiers-Infographics-AARP.pdf

[12] http://www.aarp.org/home-family/caregiving/info-08-2013/the-aging-of-the-baby-boom-and-the-growing-care-gap-AARP-ppi-ltc.html

[13] http://www.ageinplacetech.com/blog/stranded-geography-today-s-caregiver-support-ratios-and-80-population

[14] http://www.pbs.org/newshour/rundown/home-care-raise-senior-citizens/

[15] https://www.nytimes.com/2016/09/27/health/home-care-aides-wages.html

[16] http://techcrunch.com/2015/07/23/hometeam-emerges-from-stealth-to-bring-better-in-home-care-to-seniors/

[17] http://www.finsmes.com/2016/06/care-com-receives-46-35m-investment-from-google-capital.html

[18] https://www.clearcareonline.com/blog/clearcare-announces-60-million-investment-led-by-battery-ventures-to-fuel-growth

[19] http://www.aarp.org/content/dam/aarp/home-and-family/personal-technology/2016/04/Caregivers-and-Technology-AARP.pdf

[20] http://www.bizjournals.com/tampabay/news/2016/12/14/tampa-tech-health-firm-plans-4-5-million.html

[21] http://www.prnewswire.com/news-releases/aarp-showcases-penrose-senior-care-auditors-technology-at-ces-2017-300384695.html

[22] http://www.mobihealthnews.com/content/aarp-launches-caregiver-focused-website-help-unitedhealthcare-teladoc-others

[23] https://techcrunch.com/2017/02/15/aarp-innovation-champion/

[24] https://www.ageinplacetech.com/blog/real-seniors-are-rightfully-skeptical-about-technology-smartphones

[25] http://www.cnn.com/TECH/computing/9902/08/bestisp.idg/

[26] http://www.aarp.org/content/dam/aarp/research/surveys_statistics/general/2016/2016-technology-trends-older-americans-res-gen.pdf

[27] Internet adoption falls to 47% and broadband adoption falls to 34% among 75-79 year olds.

[28] http://yournewswire.com/the-end-of-the-road-for-tablets/

[29] https://www.ageinplacetech.com/blog/speak-us-voice-interfaces-make-audible-difference

[30] https://www.nytimes.com/2016/03/27/magazine/letter-of-recommendation-hasbro-joy-for-all.html?_r=0

[31] https://www.freeus.com/pers-market-insights/

[32] http://www.theverge.com/2016/1/6/10724270/fitbit-lawsuit-charge-hr-surge-incomplete-heart-rate-tracking

[33] https://www.ftc.gov/news-events/press-releases/2016/01/lumosity-pay-2-million-settle-ftc-deceptive-advertising-charges

[34] http://www.gartner.com/newsroom/id/3198018

[35] http://mobihealthnews.com/content/study-finds-readmissions-nearly-same-heart-failure-patients-using-remote-patient-monitoring

[36] Cathedral Builders Wanted, Coughlin & Lau 2006
http://agingsociety.org/agingsociety/publications/public_policy/previous.html

[37]Older Adult Technology Services, http://oats.org/

[38] http://www.pewresearch.org/fact-tank/2016/06/20/more-older-americans-are-working-and-working-more-than-they-used-to/

[39] http://www.aarp.org/about-aarp/press-center/info-07-2015/activity-sleep-trackers-show-promise-for-improving-health-for-older-consumers.html

[40] http://www.ageinplacetech.com/blog/aging-place-tech-firm-lively-out-business-what-can-we-learn

[41] http://www.ageinplacetech.com/files/xht/Challenging%20Innovators%20Final%206-23-2014%200900.pdf

[42] http://www.aarp.org/content/dam/aarp/technology/innovations/2011_04/Connected-Living-for-Social-Change.pdf

[43] http://www.apple.com/ios/health/

[44] https://www.freeus.com/pers-market-insights/

[45] http://blogs.forrester.com/susan_wu/16-04-01-the_slow_moving_consumer_wearables_revolution

[46] https://www.emarketer.com/Article/eMarketer-Slashes-Growth-Outlook-Wearables/1014896

[47] http://blog.aarp.org/2017/01/06/top-scams-of-2016/

[48] http://www.crowdfundingpr.org/greatcall-launches-indiegogo-campaign-new-lively-wearable/

[49] http://www.ereleases.com/pr/revenues-aging-place-market-surpass-30-billion-2017-semico-research-173467

[50] The North American PERS market is expected to be $3 billion by 2020. http://www.securitysystemsnews.com/article/north-american-pers-market-hit-3-billion-2020

[51] http://worldofdtcmarketing.com/only-37-of-physicians-said-they-had-recommended-a-mobile-app/mobile-healthcare-marketing-trends/

[52] http://www.aarp.org/home-family/personal-technology/tek/

[53] http://www.ageinplacetech.com/blog/future-caregiving-tech-unbelievably-large

[54] http://www.aarp.org/content/dam/aarp/home-and-family/personal-technology/2016-01/2016-Caregiving-Innovation-Frontiers-Infographics-AARP.pdf

[55] https://www.ageinplacetech.com/page/tech-enabled-home-care-rising-worker-scarcity-family-expectations

[56] http://www.himss.org/get-involved/roundtables/long-term-post-acute-care

[57] https://www.nytimes.com/2017/01/20/business/robots-ai-elder-care-assisted-living-retirement.html?smid=tw-share&_r=0

[58] https://www.nytimes.com/2016/12/15/nyregion/robotic-therapy-cats-dementia.html

[59] http://www.cbsnews.com/news/virtual-reality-rendever-mit-company-helps-seniors-physical-limitations-travel-world/