

EXECUTIVE SUMMARY

Substantial improvements in voice and AI software will be required to enable the older adult population to fully accept and benefit from the more complex capabilities of smart speakers and voice assistants. Besides pervasive broadband access in order to use voice and AI, users will expect clearer privacy protections to support greater personalization and smarter, more conversational interactions with voice assistants. Voice assistants and AI will help mitigate social isolation among older adults and enable them to securely access health and other personal information easily in the privacy of their home. As the baby boomers soon cross into their 80s, voice-enabled experiences will be compelling – and providers will work to deliver them.

WHO SHOULD READ THIS REPORT?

- Investors and funds that focus on consumer and medical wearables
- Healthcare providers
- Retail health care (pharmacy chains, technology retailers)
- Senior living organizations and professional home and health care companies
- Integrators and service providers helping enterprises deploy health offerings
- Technology platform providers (hardware, software)
- Telecommunication carriers supporting wearable interactions
- Life sciences companies (pharmaceutical, generic drug, biotech, medical technology)
- Retailers selling consumer wearable devices, smartphones, health technologies
- Real estate developers focused on the 50+ market

ACKNOWLEDGEMENTS

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VOICE-ENABLED TECH – JUST RIGHT FOR OLDER ADULTS?

Speakers, Voice Assistants – Tech that Finally Makes Some Sense

Not long ago, technology users were typing and a-swiping, tapping, and re-typing. Then the tiny speaker in Google search appeared in 2011 and Google’s Voice Search emerged in 2012; Amazon’s Alexa arrived in 2014. By 2018, it was apparent that a tech revolution was underway, one that would [provide a better user experience for older adults](#). That experience is already apparent in the growing adoption of voice services in senior living communities. Individual users are increasingly expecting a voice-enabled experience for interactions at home.

Voice assistants made device hardware actually seem smart. By 2018, more technology (and associated improvements) could be found in the Cloud. Besides these invisible upgrades, the voice assistant technology has been continually improving – and if the user could be made aware of those improvements (a BIG IF), they might find them to be very useful. Consider voice-enabled smart plugs, thermostats, audio books, traffic directions, weather, and news updates – and answers to questions that might matter about health, social connection, and personal safety. Today 95 million US adults have smart speakers and [85% of US adults own a smartphone](#). Both platforms are now in position to deliver value and benefit to older users.

“There is a bias that seniors don’t use tech. But seniors are consumers -- of smartphones, smart speakers, voice-enabled TV remotes. We will see more use of Wi-Fi sensing, smart cameras, and video doorbells – voice-enabled. It is such a compelling user interface for seniors with arthritis.”
– Jennifer Kent, VP Research, **Parks Associates**

Voice technology has become ubiquitous and useful... Voice assistants enabled smartphone accessibility and enabled voice requests at home, when outside and in the car (see **Figure 1**). However voice assistant use may have plateaued (as the Gartner graphic indicates). [Smart speaker growth has stalled](#) and voice assistants and AI, [exciting in 2017](#), were past [peak expectations](#) by 2020 and (see **Figure 2**). Despite any diminished enthusiasm, voice interfaces, including on a smartwatch, are increasingly accepted by older adults (see **Figure 3**).

...But may fall short of user expectations. Tech providers have yet to find a way to keep users aware of new features, which can surface as a (perhaps welcome) surprise. And users may tend to stick with the features that they know. But as many new features are added, expectations are growing. For example, consumers cannot complete the initial setup of voice devices by voice. Conversational capability (‘multi-turn’) is still quite limited outside of call center interfaces. Voice assistants are still ‘not good at maintaining context within a session or across sessions’ or even making recommendations based on your previous interactions. And smart home setup of voice controls is still cumbersome.

Voice-AI and Older Adults 2022

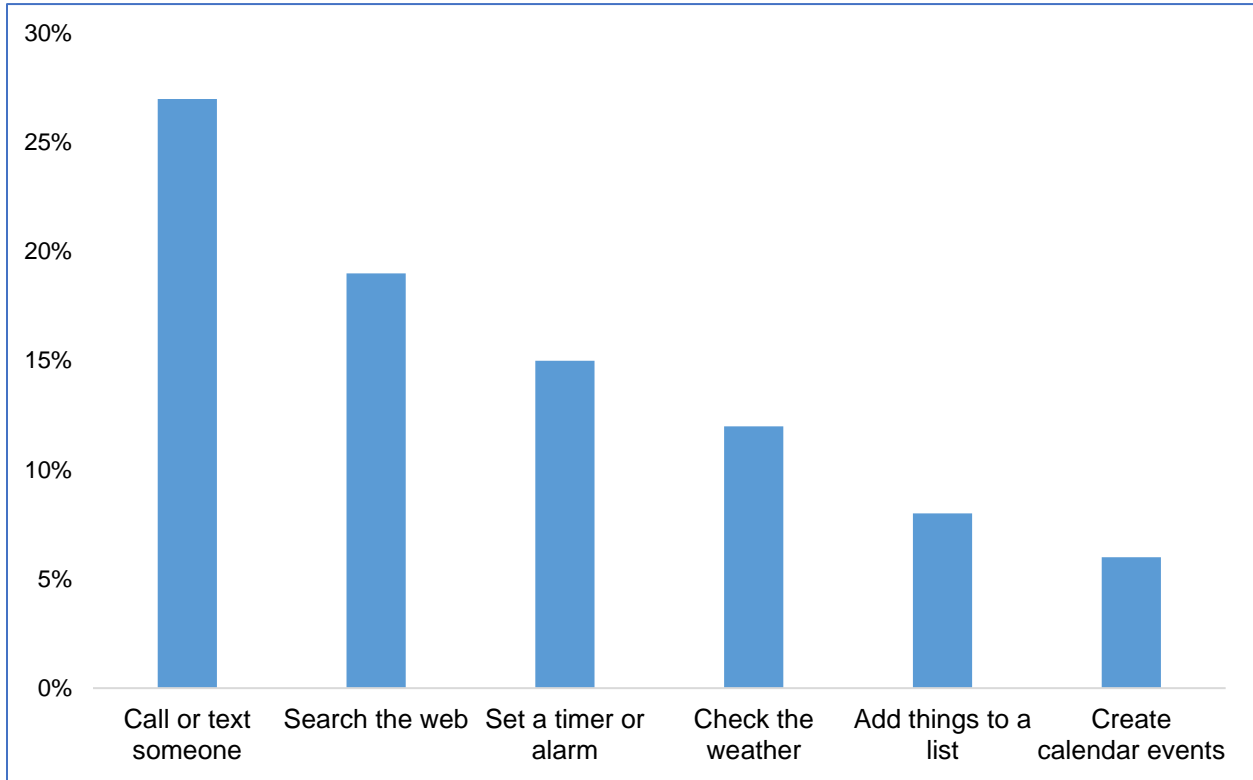


Figure 1 What activities are people doing via voice?

Source: CivicScience March 2021

*“Voice assistants can be more proactive in narrow settings – in car or at the door -- ‘your gas is low -- would you like to stop by a gas station?’ or the Alexa Doorbell Concierge – greeting a person at the door with instructions to leave a package.” – Bret Kinsella, CEO, **VoiceBot.ai***

In the midst of a severe labor shortage, voice assistants help provide service. Whether it is answering the phone, handling a [drive-through customer](#), or responding to restaurant calls for To-Go orders, voice assistants augment limited staff. Today, Google Assistant is estimated to be installed on 3.5 billion devices, enabling use of smartphones for turn-by-turn voice directions in cars, asking about nearby gas stations, or finding the nearest ER. [And consumers will be buying more smartphones and smart speakers](#) in 2022, according to the Consumer Technology Association. For those older adults who may never get traditional broadband access, the expansion of 5G is a benefit in situations where higher speeds are useful, for example, such as FaceTime or Zoom, streaming audio and video, and smart TVs.

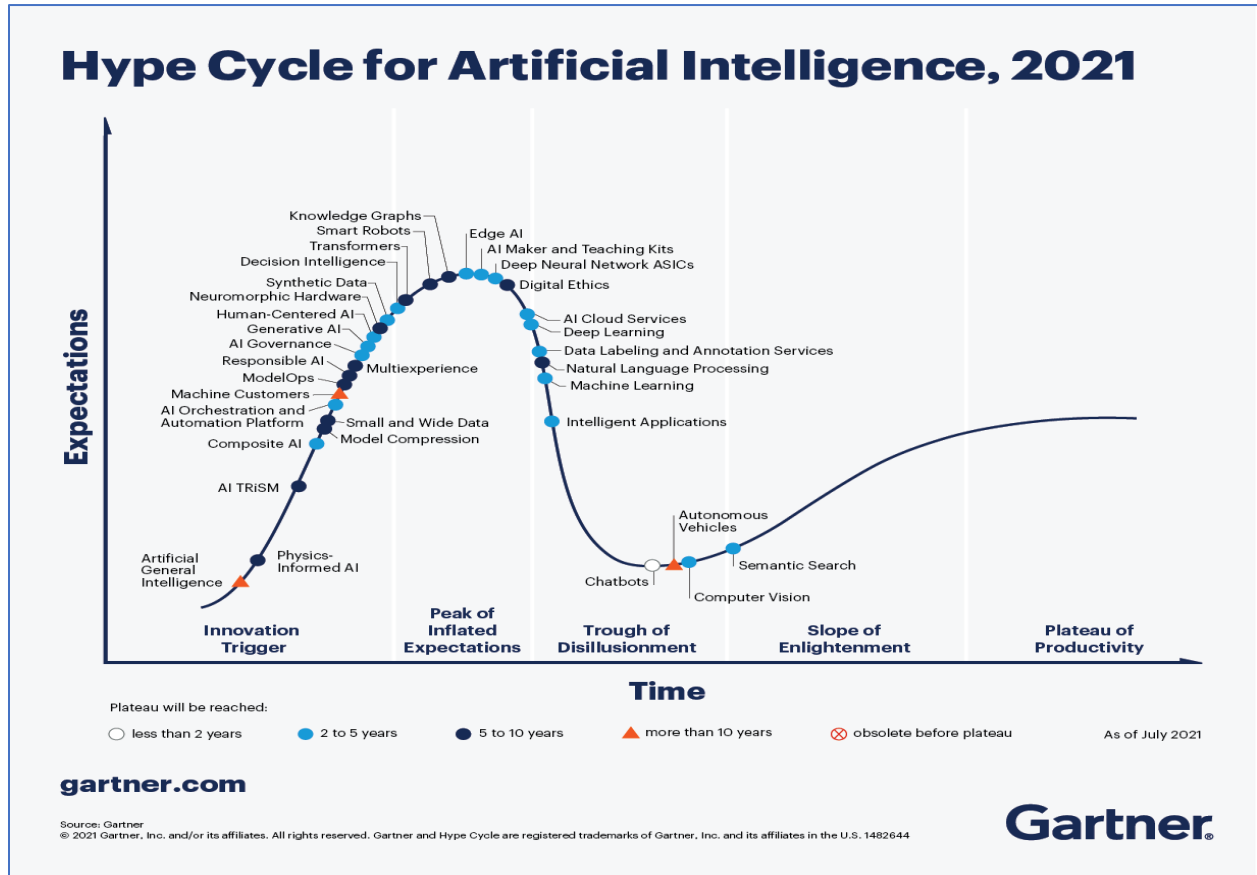


Figure 2 Gartner Hype Cycle

Source: Gartner

Voice-enabled benefits emerge for older adults

Covid-19 drove tech adoption overall for older adults. And lack of Wi-Fi access in senior living cut off families and older adults from each other. It became clear that Wi-Fi and broadband connectivity emerged as a new and critical determinant of health during the pandemic. Soon tech adoption by older adults [sky-rocketed, according to AARP](#). As smartphone and smart speaker adoption by older adults ramped up, users could benefit from of smartphone access to voice assistants like Siri, Alexa, and Google Assistant, although smart home adoption by older adults lagged behind.

Use cases have proven valuable for seniors. These included daily check-ins, medication reminders, “drop in” for hands free video calling, or calling out for help in an emergency. These ideas became part of Amazon’s growing number of offerings for older adults. They included [Alexa Care Hub](#) which became part of Alexa Together, and also expanded their Alexa for Hospitality suite of offerings. As [the number of users of smart displays grows](#) and smartphone use by older adults continues to increase, the number of voice-only experiences may decline, replaced with multiple options – voice, smart display and the ever-more-pervasive chatbot.

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“The demand in the senior living industry for voice is as high as it ever has been, but of course it is all dependent on availability of Wi-Fi.” – Ginna Baik, Amazon Alexa Smart Properties

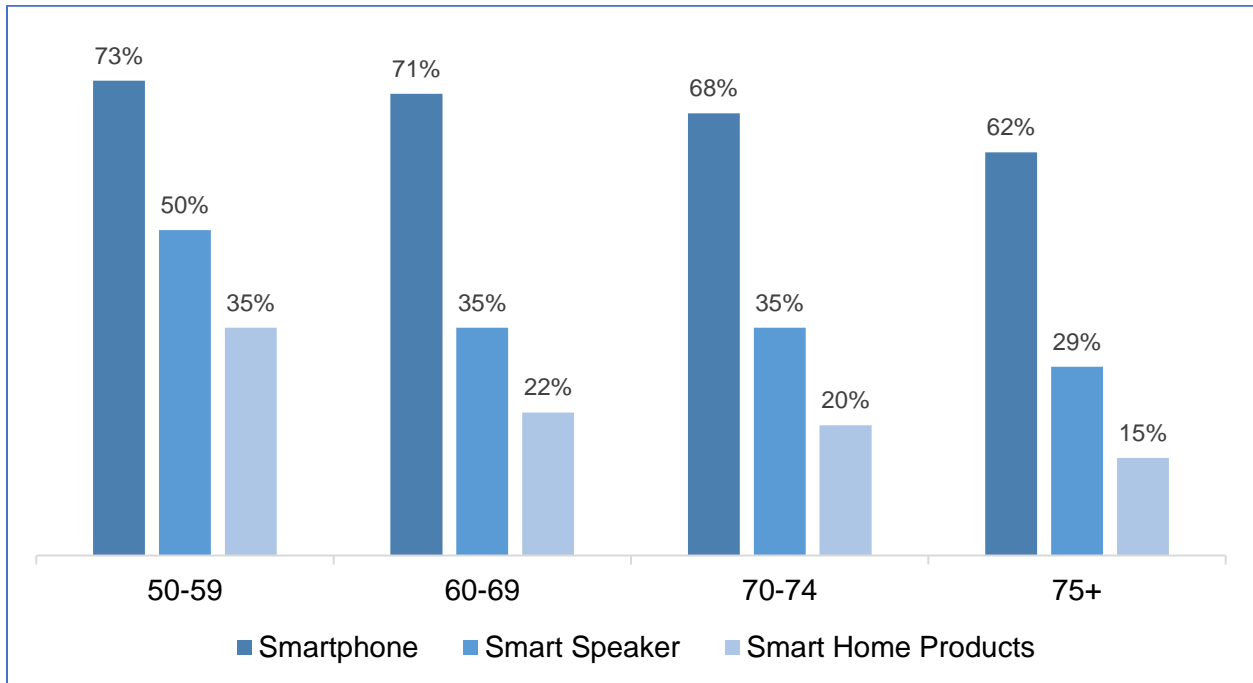


Figure 3 Technology adoption by age group as of May 2022

Source: [Parks Associates](#)

As speech recognition improved, so did its utility for seniors. According to Parks Associates Q1 2022 research, 35% of aged 65+ internet households own smart speakers. Technology access has become more convenient – for example, turning on lights that cannot be reached, adjusting temperature from a chair, and setting automatic timers and scheduled reminders. During the pandemic voice interactions for those with the technology helped mitigate the [social isolation felt by those older adults](#) who owned smartphones or smart speakers. And so voice assistant adoption of Alexa, Siri, and Google Assistant grew among older adults (see **Figure 4**).

“We did a study in the Netherlands – gave away 10,000 smart speakers. 71% of the recipients said their lives were better as a result. In the future, assistants will not be tied to a speaker. – Maarten Lens-FitzGerald, Project Zilver

Voice-enabled offerings target individuals at home. Most older adults will [be aging at home](#), a trend recognized as an opportunity for voice-enabled services in the home. [Speak2Family](#), [Constant Companion](#), [Addison Care](#), and [LifePod](#) offer voice-enabled monitoring and interactions to support older adults. In 2022, [Alexa Together](#) launched, a voice-enabled system for a circle of care to keep tabs on and support older adults living alone. The system combines remote services like reminders and shopping for an older adult with alerts, such as no activity with Alexa; fall detection (via a wall-mounted sensor) and emergency response; and as well as enabling access to a circle of supporting individuals.

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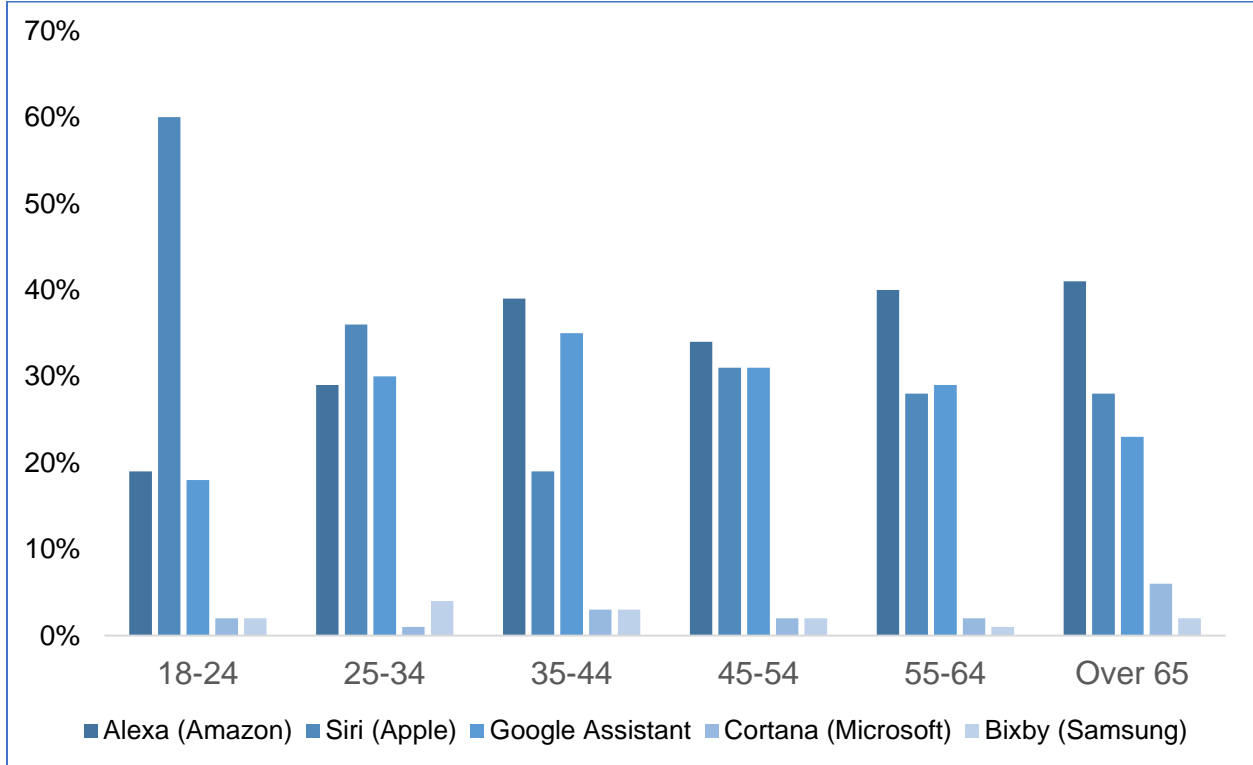


Figure 4 2021 Voice Assistant Adoption by age

Source: [Statista](#)

Voice-enabled expectations in senior living are rising along with adoption. Smart speakers are being deployed across multiple senior living organizations via [Alexa Smart Properties](#), a process made [scalable through pre-configuration of multiple devices](#). Amazon also offers a related Solution Provider program (spanning hospitality, senior living, and healthcare) that offers senior living companies options among a [curated group of firms](#).

Voice concierge has possibilities in senior living. Touchtown acquired Volara which is used in multiple senior living organizations and is now branded as [Touchtown Voice](#) -- offering a Voice Concierge (see **Figure 5**). Both Touchtown and Amazon assert that interactions with older adults should NOT be personalized, simply offering suggestions and reminders about activities in the community. This is likely an artifact of privacy concerns coupled with the clumsy configuration process for a single user versus large quantity setups. But as residents become more accustomed to voice interactions in the future, a logged in and personal experience should be crafted so that residents do not need a second device for personalized use to play their own favorite music or read aloud their own books.



Figure 5 Touchtown’s example of a Voice Concierge

Source: Touchtown

“Tech is now top of mind for senior living – however the infrastructure has not kept up. The next wave of seniors will move in with their tech preferences – and families will ask ‘Do you have the infrastructure for me to do video chatting?’” – Michael Rethage, EVP, Senior Living, Uniguest/Touchtown

Barriers to adoption and tech limitations remain

Access, trust, and data privacy concerns persist as barriers to voice/AI adoption. Today more than 75% of the 65+ use the Internet, though [only 64% of them have home broadband](#). Although there has been notable growth in Wi-Fi-access for older adults, older adults have expressed concern with trusting voice/AI technology, although trust has also been a [concern among all age groups](#).

Technology literacy and poor design remain a barrier to gaining greater benefits.

Particularly in understanding data privacy policies, in [AARP’s 2021 survey](#), fewer than half understood that a privacy policy does not prevent a website from sharing the user’s data. And in the 2022 report, [45% of responders age 70+](#) felt that technology was not designed with people of all ages in mind, and that voice assistants [were not designed with all of the features useful to older adults](#).

Design processes need to include older adults – the biggest beneficiaries. Few studies have been large enough to reveal all the shortcomings of voice/AI technology for older adults, but regular users can see that the design process needs work – incorporating older focus groups at the design and user testing processes – and adding feedback loops once products are in market.

PROGRESS IS NOTABLE, MORE TO BE DONE

Many improvements – unseen and seen

Basic expectations are increasingly met and/or exceeded in fundamental features and dialogue. Unlike the perpetual upgrades of smartphone and PC apps, the improvements were made in the cloud, no download required, producing new categories of capability, and delivering fundamental notable improvements for the consumer (see **Figure 6**):

Macro Change	What it is	Example Today
Voice command and control	Start and control user services by voice only	Initiate a call, request music, control a smart TV, turn on lights
Conversational AI	The ability to complete transactions with the aid of a voice assistant	Order food, make a reservation, request a ride, receive customer support
Voice biometrics and diagnostics	Use one’s voice to gain secure access	To a personal account or to receive a medical diagnosis via voice analysis
Voice transcription	Convert spoken words accurately into written text	Medical or legal professionals; those with hearing impairments

Figure 6 Voice-AI capabilities transformed interaction **Source: Amy Stapleton, [Chatables](#)**

Recognition of intent. What we want to ask – and the answer we get – has been steadily improving. [Platforms are increasingly optimized for voice search](#), especially smartphones. And built in AI that learns from what the user is asking is at the heart of how these improvement happens, though query failures are common – and [have been tracked at least since 2019](#). When searching for services, users have increasingly been asking for results ‘near me’ – pushing retailers and other providers to make local content available to voice-enabled search engines.

Startup of new devices has improved for multi-user environments. As noted about Amazon and Touchtown, startup of devices in quantity can be relatively simple. But for personal use, the [still-clumsy two-step setup process](#) is still [required](#) and can be a burden to the device owner or to the caregivers of a novice user.

Language support begins to catch up with the world. There are [430 languages spoken in the US, with 40 million Spanish speakers](#). Today Alexa, Google and Siri support a growing number of languages. Search and [voice bots for customer assistance are available in 100 languages today](#). [Deepgram](#) supports 23 languages with 90% accuracy in its audio transcription engine, offering a [batch transcription service for call centers](#) that can identify 10 speakers on a call.

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Voice interfaces in cars are expected. Even those reluctant to use voice assistants for other purposes appreciate it in the privacy of a car, whether it is asking a question (where is the nearest gas station?) or getting directions, hands-free interaction in a car is a safety improvement at the very least, and a major convenience for the driver. And [car makers see this and intend to offer it](#) in most new cars.

Visual devices are multi-purpose and useful. The emergence of counter-top smart displays [like the Echo Show](#), [Facebook Portal](#), [Google Nest Hub](#) or [Lenovo](#), among others, make it feasible to ask a question, conduct a Zoom call, view a recipe demonstration, or get the lyrics to a song displayed in large font – all potentially useful delighters for older adults, especially for those living alone.

Accessibility improvements and breakthroughs are frequent. Voice-enabling devices was a breakthrough for individuals with no or low vision, including smart canes. Microsoft's SeeingAI uses vision in a smart phone to help blind users – they can move the phone in front of items that SeeingAI reads and reports what it sees. In 2021, [Voiceitt was introduced for people with non-standard speech](#), including speech disabilities or disorders. It learns by listening and translating into speech patterns that can be recognized, for example, to control smart home devices. And Alexa supports speeding up the speech rate to the pace that blind people expect.

“We created an intelligent cane. Users will be able to issue commands to the cane such as where am I, and what’s the battery level.” – Paul Burden, WeWalk

What broader changes are enablers for older adults?

The overall technology market has delivered enabling improvements such as:

Voice has become a feature expected everywhere. Soon expectations of voice interactions will be so pervasive that we will begin speaking to a device and be surprised when there is no response. Analysts expect that voice-accessible offerings will be a [\\$46 billion global market by 2027](#). One possible limiting factor has been the lack of traceable revenue to voice, aside from devices or voice-purchased product sales. And users may inquire of their voice assistant and buy in a store. Whether due to distrust or lack of awareness, older adults are less enthusiastic than the general market. As a result, those who interact with seniors inside and outside of senior living are cautious about recommending or adopting – and that hesitation includes health providers.

Interoperability standards are beginning to “Matter.” The standards initiative that produced the new [Matter standard](#) may enable one interface application to control products running via different in-home platforms. Perhaps that will make the smart home seem to be a single Internet-enabled place, rather than a collection of hubs-and-devices. [Apple](#) is on board with the Matter initiative, as are [Amazon](#) and [Google](#). And most device makers for the home will want to comply, whether with thermostats, smart speakers, appliances, or [smart TVs](#).

No updates required – the hard work is in the cloud – but the user is unaware. We take this for granted today for many software products -- but gaining automatic updates through cloud-based software was a breakthrough. It changed the timing of useful benefits from periodic (or never) to continuous. No need to upgrade the operating system to a new version or download the latest 20.2.3 revision with its boatload of bugs. The problem? Users don't know what improvements have been made that they might value. Instead, purchase of a device or download of an assistant may ask for permission to receive a periodic email about new useful features (like Alexa's new [Call Captioning](#)), an email they can choose to delete. Or they could periodically check [free websites like Tom's Guide](#) or [Tech-Enhanced Life](#).


Voice tech innovation – creating new choices

Some technology changes created new dilemmas for both developers and users, such as:

Does on-device or in the cloud matter for privacy? Although many believe that voice [tech significantly helps older adults](#) (and their younger caregivers), some older users may worry about tech that always listens. Smart speakers, [Google Assistant](#) or [Apple Siri](#) are based on machine learning/AI, and a growing amount of [on-device intelligence](#). Says [VentureBeat](#): “On-device AI means that smartphone assistants get brighter ‘all the time’, with contextual conversations, enhanced noise suppression, and instantaneous, on-the-fly language translation.” But mistakes and breaks happen receiving wide-spread [coverage of vendor errors](#) and flaws [exposed by researchers](#). The result? Users may become more hesitant as a result, further eroding trust.

On the wrist or in the home? The market for leveraging data from a smartwatch is at an early stage. But individual smartwatch wearers are generating an inordinate amount of information about their behavior. The possibilities of applying machine learning about changes in that data over time are as yet untapped. Some are beginning to look back to enable questions about when gait instability began, when heart rate variability began, what is the change in frequency of falls?

“Today a person can have a conversation on the watch with a caregiver or response center about the nature of a fall. We are training an AI neural network internally on behaviors that predict falls.” – Shea Gregg, Founder & President, **FallCall Solutions**

The microphone  – it's on – do we care? The symbol on smartphones and search applications and voice interfaces is ubiquitous, even when not obviously required. Consumers may not even notice that conversational TV remotes are standard with newer TVs. And older adults with vision issues may not notice it on the side of the Apple TV remote. Or worse, they are patronizingly steered to [websites for easy-to-use remotes](#) that lack microphones.

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“Voice takes care of issues that used to have commands or buttons. Some use voice commands frequently, some never do, despite the size of the voice symbol. Perhaps people are embarrassed to talk to the TV.” – Doug Gravino, Senior Director, **Cox Communications**

AI and machine learning – now, more improvement needed. Among the many tech changes accelerated by Covid-19 and invisible to the consumer was the use of artificial intelligence, most notably in the form of machine learning from data collected about behavior. PwC noted that [52% of companies accelerated their AI plans](#), and 74% anticipated that it would help enable more efficient processes. And that was before the full brunt of today’s labor shortages had pushed efficiency and smarter use of data to the top of the priority list. Yet AI has yet to be well utilized to serve older adults, whether that’s insights, advice, or prediction of issues.

“If Facebook can use behavioral scientists to get you to stare at the screen all day to sell you, then we can use those same behavioral sciences and predictive analytics to improve your life.” – Scott Moody, CEO, **K4Connect**

AI and voice in healthcare – much sound, but little fury. Many have hoped for more meaningful use of AI and voice, improving access to and delivery of health care – to date, it is more of [a vision than reality](#) (see **Figure 7**). The possibilities are extensive – many outlined in [Voice, Health and Wellbeing 2020](#) – not the least of which is voice-enabled transcribing, accurate and [three times faster than done by a person](#). At-home voice chat replaying [voice care instructions at home](#) is compelling, if only the [provider suggested it or participated](#).

“Upon discharge, more than three-quarters of people do not understand what they were told. If we could make a dent in treatment adherence, that could transform care around the world.” – Anthony Dohrmann, CEO, **Electronic Caregiver Group**

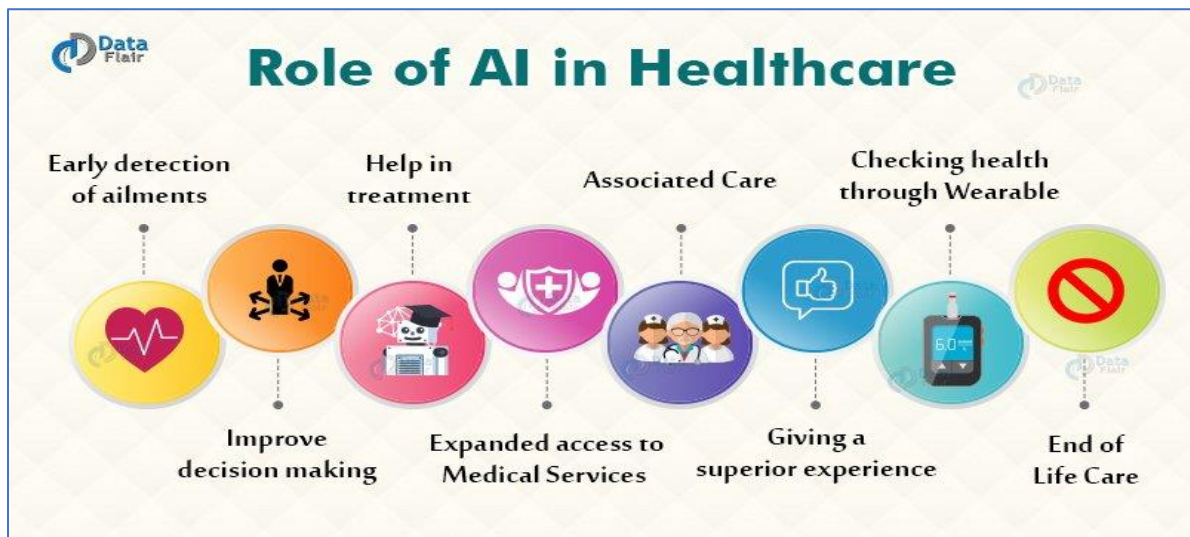


Figure 7 One consultancy’s view of the AI/healthcare opportunity **Source:** [Data Flair](#)

FOR VOICE-AI 3.0 AND BEYOND

The interviewees for this research identified limitations in some of today’s voice offerings – some of which they believe should have been addressed by now. And they saw opportunities for improvements ahead that will make the user experience more sensible and meaningful to them:

Multi-turn conversations (aka ‘conversational AI’) will mature. Product brands are attempting to [process natural language inputs](#) so assistants can ‘talk’ with humans – for example, with [voice food ordering](#) in a drive-thru or other restaurant. The goal is to minimize dependency on scarce workers if they are not needed. If a parking garage can offer a conversation, similar interactions should soon be available in multiple retail services and commercial categories that can leverage a user profile (see **Figure 7**).

“The next big trend: AI and machine learning will enable conversational, tree-structured dialogue, with the ability to analyze and direct based on responses and data related to the user.” – Alan Bugos, COO and EVP, **LifePod**



Figure 7 Multi-turn conversation for finding a parking space

Source: Voicebot.ai

Help us know what we don't know. Interviewees noted that users master the handful of tasks that they know work – and then quit exploring. They stop looking for new tasks or more options, perhaps having tired of the process. For example, Alexa's attempt to help users 'order' new items may be helpful – or annoying. On the other hand, subscribing to a notification about [What Alexa can do this Month](#) can be an eye-opener (They added 'Find my car' or 'Check my symptoms'). Asking "What Do You Know" on Alexa retrieves a table of contents of topics. But ask the same question elsewhere and the result is either silliness (Google – "I know I still have a lot to learn") or dopey (Siri – "here's what I found on the web"). One [study in low-income housing](#) described participants as "frustrated with not knowing what Alexa can do."

Still clueless after all these years? Several interviewees noted that despite years of evolution and millions of saved questions and answers, devices are not yet targeting what users want or offering odd responses. For example, the notification light appearing when a package is delivered – this initially seems useful but can become an irritation. Sometimes changing response behavior requires a return to the smartphone app (seriously??). And the assistants frequently misunderstand the user, answering what wasn't asked, launching a multi-paragraph narrative ("How do you treat an infection?" or settling on a list ("What do you know about health?").

UP NEXT: IMPROVED PROFILE AND CONTEXT

Despite the concerns about privacy that have dogged progress in voice tech, contextual understanding is improving, but still falls far short of help needed for isolated older adults. As utilization increases, vendors will want a startup profile that can be maintained by individuals, families, or a community staffer. The profile can become the basis for tailoring responses and notifications that are relevant and even actionable. Once understood, they will be particularly useful to an aging population living alone, their caregivers, and clinicians who may be part of their medical team. Although profiles enable a [voice service to offer specific content today](#), tomorrow appropriate permissions will enable:

Insights about behavior that matter. We are barely at step one of predictive analytics utility for older adults. But by the time the oldest baby boomers turns 80 in 2026, device and assistant adoption should have produced enough data to help them with later life (see **Figure 8**). This includes the observations from smartwatches ("You had more steps last week than this week"), but also about movement, voice hesitations, the sound of falls, food delivery orders, and needed car services. By then, signals will come from changes in tone or pace of response, flagging possible concerns when the user falls frequently or repeats the same question 20 times.

"Proactive tech should notice changes happening with the individual – if someone isn't feeling well, that should trump suggestions about physical exercise." – Dor Skuler, **Intuition Robotics**

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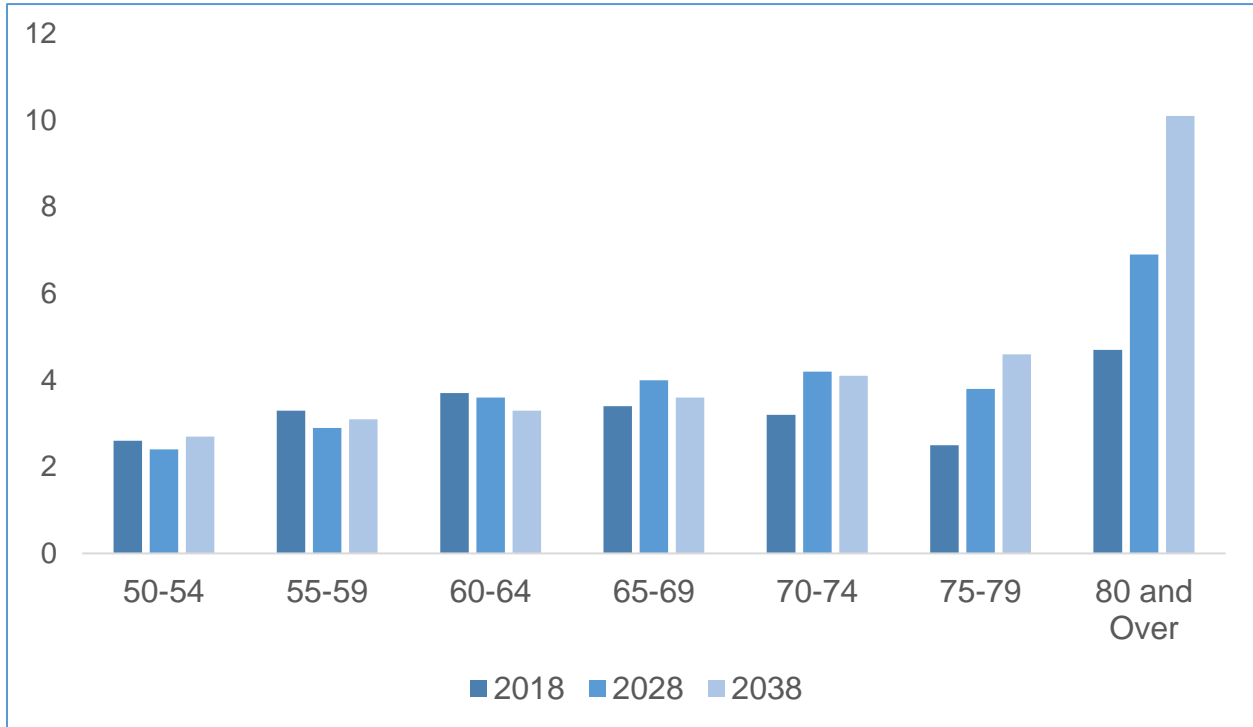


Figure 8 Single-Person households by age (millions) **Source:** [JCHS of Harvard University 2020](#)

Awareness about where you are and what the assistant knows about that area. This seems obvious, but may also be hampered by the ([sometimes justified](#)) privacy paranoia that has gripped user attention – and perhaps strangled innovation or deployment. Helping users be aware of the tools they should use to protect their privacy would be a good mass-marketed concept. But it could be even more useful to educate users about [data privacy](#). And although [voice-enabled commerce](#) (whether the actual purchase or the preceding research) is a real trend in convenience, that education will be required to overcome hesitation of older adults.

“While there is plenty of interest and activity in the use of voice, there is no comprehensive strategy around implementation of solutions for aging services. And broadband accessibility and affordability remain challenges to be solved.” – Judy Collett-Miller, **Parker Life**

Recommendations and alerts must be relevant. Voice-enabled sales pitches and repetitive reminders are tiresome, but information about restaurants, brands and services in the neighborhood can be meaningful. Unless requested, older adults may not want to hear reminders to take their medication from a smart speaker or assistant. But they could be very pleased if they ask about a pharmacy nearby and the response names the right place and exact distance.

“Voice services should teach people how to help themselves, with suggestions like “By the way, would you like to be reminded about afternoon trips every day?” – Ann Thyme-Gobbel, Voice UI/UX Researcher, **Milo**

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But research studies are needed to quantify concerns. One small study probed privacy concerns of [older adults and voice assistants](#). There was not much concern, but responders still want more regulation. Another study examined existing research, [noting multiple positive benefits](#), with more detail about user experience in [one study in particular](#). Researchers saw a need for more research about use of voice for individuals with cognitive impairment, though it was clear that there could be great benefit, especially for those living alone. A global study by Qualcomm showed that concerns diminished some between 2019 and 2020 (see **Figure 9**). Ironically, even more valid privacy concerns about using email, search, phone apps, or health portals does not limit the use of any these tools. So it is likely that voice-enabled tools, including chatbots, will be just as accepted by older adults over time.

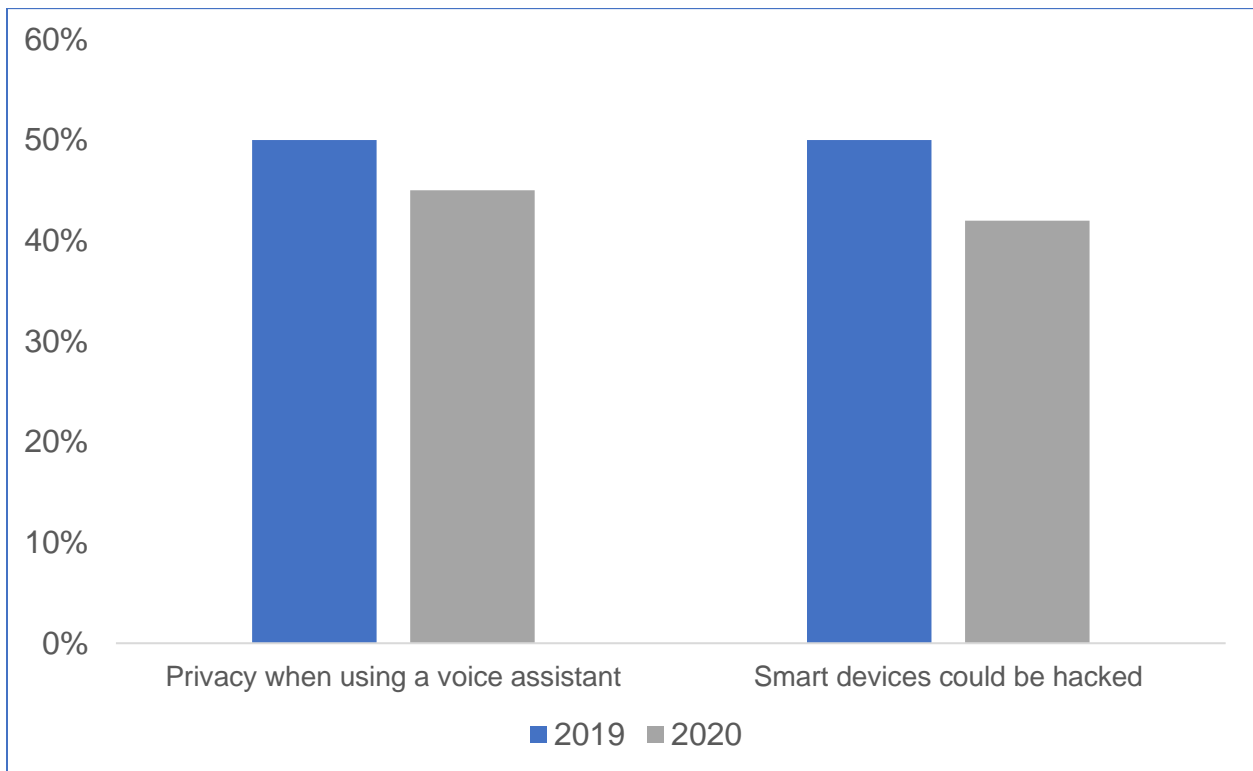


Figure 9 – Smart Speaker Privacy and Security Concerns Worldwide Source: [Qualcomm](#)

“Privacy is an important issue when it comes to voice assistants. There needs to be a balance between the peace of mind of having the technology available but also the options to control for the individual’s privacy.” – Steve Ewell, Executive Director, **Consumer Technology Association Foundation**

CONSIDER THE FUTURE OF VOICE-AI FOR OLDER ADULTS

Extending today's features and functions of smart speakers and assistants into genuine voice-enabled helpers takes little imagination. It does take motivation, however, which will likely come from older adults and their families. It will then extend to senior living and home care companies as they observe more effective ways to utilize staff and create a better experience for care recipients. And all will seize on the [growing availability of broadband](#) that will be one of the prerequisites for that better experience. What's next?

Voice assistants will help mitigate growing social isolation of the oldest. A voice heard in a house of an older person living alone cuts through the silence, even if it is a conversation with a device. Today, [one-third of adults aged 65+ live alone](#). That means they likely eat meals alone, and in particular are alone in the evening and during bad weather. And the percentage living alone increases as people reach their 80s – [58% of older adults aged 80+ live alone](#) now.

“It would be good to see more functions that address loneliness, community, and human connection. these are vitally important to everyday quality of life.” – Lasse Hamre, CTO and Co-Founder, **Aloe Care Health**

Voice assistants (or visual displays) will be useful for managing health. Eventually the fear factor about always listening and communicating by voice will pass a technology tolerance threshold. That could be when more than 50% of those aged 65+ own smart speakers or use phone-based assistants. At that point, their role in maintaining health and wellbeing will be acceptable. Especially for those [like solo agers](#) or 80-year-olds living alone, they will want the connection and communication offered from recipe suggestions for better health, a suggestion of a favorite song played during mealtime, or a doctor-provided reminder.

“Consider the home care services or health care markets – having the voice of the physician in your home is where we are going with our sensor technology and data collection.” – Kay Raffi, **Cox Communications**

The smarter home will leverage sensors placed throughout. The smart home continues to be a gaggle of gadgets, useful but uncoordinated. Consider the possibilities of [smart homes and seniors](#) or perhaps a smart home [subscription service offering](#). Unfortunately, no provider has actually agreed on a standard definition of what comprises smart home, let alone a smart home for older adults. And the comings-and-goings of products on the shelves of [Lowe's for Aging in Place](#) or [Home Depot for Independent Living](#) are begging for guided assistance. But combining voice and AI long-term with a subscription offering will make sense to users once market dynamics, including Matter standard compliance, are sorted out (see **Figure 10**).

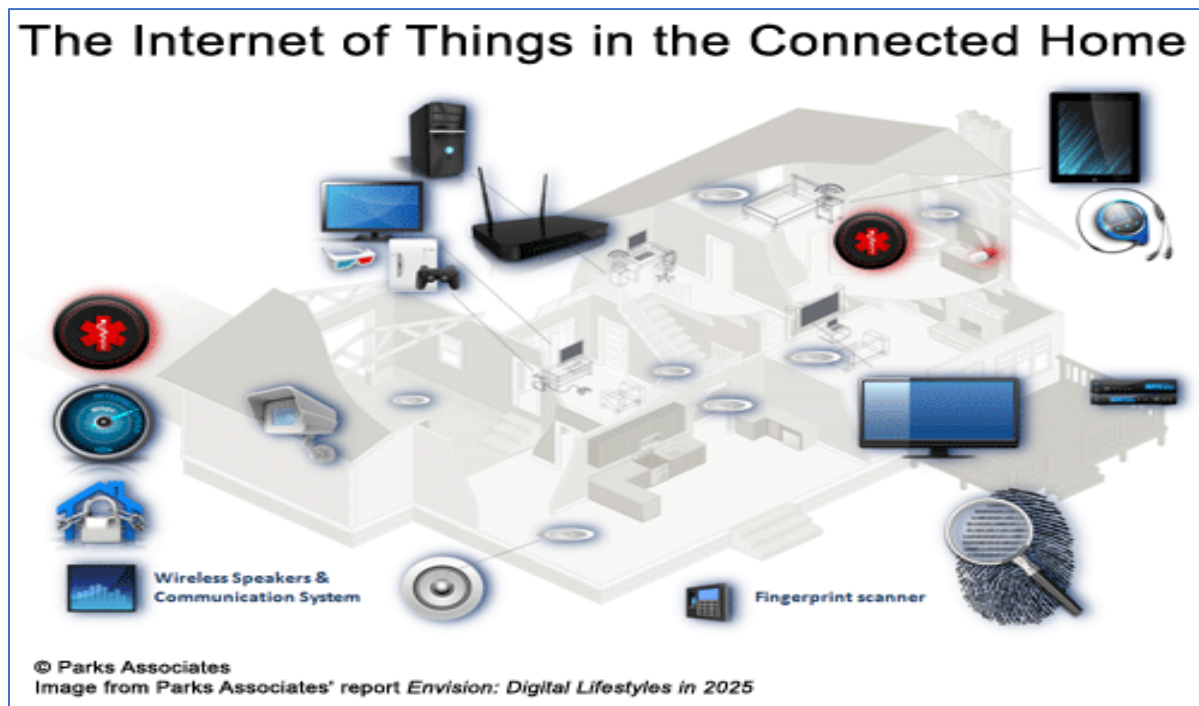


Figure 10 The Internet of Things in the Connected Home 2025 **Source: Parks Associates**

“I look forward to the day when ‘ambient awareness’ in the home will allow people to comfortably converse with AI both for a sense of companionship and utility, proactively reaching out when certain triggers occur.” – Rick Robinson, AARP

Broadband, voice, and AI are mission critical for senior living. The senior living industry is challenged in 2022 to ramp up occupancy back to its pre-pandemic levels. As a result, they may not be focused on enabling resident broadband in their communities. But very soon organizations in competitive markets will see that infrastructure for voice-enablement (concierge, reminders, monitoring, fall detection) is a differentiator. It will particularly matter for prospective move-ins to independent living settings, setting the stage for a tech concierge service to help novice users. Voice services will support a resident as they age in the community.

“Residents and their family members expect voice commands for apartment conveniences and for communication with family members. Caspar's voice help and automated alerting allow residents to stay longer in their residential apartments.” – Ashutosh Saxena, CEO, Caspar.AI

AI will be applied to improving wellbeing in old age. Pendants are obsolete, replaced by smartwatches and Wi-Fi enabled motion fall detection capabilities – underpinned with AI. Recommendations based on the history of a user’s conversations will be accepted and standard. New features will be offered based on utilization of existing capabilities (music, recipes, trips, books, advice). Comparisons between an individual’s status and the general population will be

made prior to a suggestion about health, activity, and engagement. The more profile information available and securely store, the better the experience.

“AI is the only way you can do fall prevention. If you provide appropriate data – 90% of falls at night or when a person comes home from the hospital – there are so many machine-learning possibilities in senior living.” – Fahad Aziz, COO, **CareMerge**

Imagining the Future

Improvements in voice and AI software will be required to enable the user population to accept and benefit from more complex capabilities of smart speakers, voice assistants, and AI. That means taking sizable steps forward from today’s tentative progress. Within the next five years, users should expect and demand changes such as (see **Figure 11**):

Today’s Constraints	Future Functionality
Clumsy single-device setup	Profile-driven setup by voice
Voice-only interactions	Screen and voice, useful chatbots
Limited broadband access for seniors	Ubiquitous broadband, all settings
Mostly question-and-answer	Proactive multi-turn conversations
Limited knowledge of user	Opt-in, personalized relationship
Voice concierge in senior living	Voice-enabled tech concierge for all
Older adult tech training is limited	Older adult tech training is widely available and expected
Voice-enabled smart home tech offers access to devices	Voice-controlled smarter home improves aging quality of life
Symptom checkers and health facts	Health suggestions and proactive monitoring of health at home

Figure 11 Changes that will enable broader benefit for older adults

“The power of proactive voice will be transformative because it will enable virtual assistants, and eventually robots, to initiate and manage a range of conversations with older adults.” – Stuart Patterson, Co-founder, **LifePod**

Resources

[Consumer Technology Association 2022 Technology Ownership and Market Potential](#)

[BMC: Are we ready for artificial intelligence health monitoring in elder care?](#)

[A Beginners Guide to Conversational AI](#)

[Using AI, Data Analytics to Enhance Person-Centered Care for Seniors](#)

[Tech-Enhanced Life, A Voice Reminder App Review](#)

[NY Times: The Best Smart Home Devices for Aging in Place Comfortably](#)

[Project Zilver Research: Voice Connects, 2020](#)

[The Future of the Smart Home and Older Adults 2021](#)

[Voicebot.ai – technology trend news and research](#)

[The Future of Voice First Technology and Older Adults 2018](#)

[Amazon “Alexa” Pilot Analysis Report](#)

About Laurie M. Orlov

Laurie M. Orlov, a tech industry veteran, writer speaker, and elder care advocate, is the founder of [Aging and Health Technology Watch](#), which provides market research, trends, blogs, and reports that provide thought leadership, analysis and guidance about health and aging-related technologies and services that enable boomers and seniors to sustain and improve their quality of life. In her previous career, Laurie spent many years in the technology industry, including 9 years at analyst firm Forrester Research. 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. Her segmentations of this emerging technology market and trends commentary have been presented in the Journal of Geriatric Care Management. Her perspectives have been quoted in Business Week, CNBC, Forbes, Kiplinger, NPR, the Wall Street Journal, and the New York Times. She has a graduate certification in Geriatric Care Management from the University of Florida and a BA in Music from the University of Rochester. Clients have included AARP, Genentech, CDW Healthcare, Calix, and Home Instead. Her latest reports include the [2022 Market Overview of Technology for Aging](#), [The Future of Smart Homes and Older Adults 2021](#), and [The Future of Wearables and Older Adults 2021](#), Laurie has been named one of the [Top 50 Influencers in Aging by Next Avenue](#) and one of the [Women leading global innovation on Age Tech](#).

Firms that provided insights for report -- with website link:

[AARP Innovation Labs](#)

[Aloe Care Health](#)

[Amazon Alexa Smart Properties](#)

[CareMerge](#)

[Caspar.ai](#)

[Chatables](#)

[Cox Communications](#)

[CTA Foundation](#)

[Electronic Caregiver Group](#)

[FallCall Solutions](#)

[Intuition Robotics](#)

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[LifePod](#)

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