

Top 10 Consumer IoT Trends in 2017

A Parks Associates Whitepaper



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Top 10 Consumer IoT Trends in 2017

In this whitepaper, Parks Associates identifies 10 key trends impacting the market for consumer technology now and into the next year.

1. **Voice control** is vying to become the primary user interface for the smart home and connected lifestyle.
2. The smartphone market plateaus, and **mobile carriers experiment** to retain subscribers, which will threaten fixed broadband services.
3. CE manufacturers focus on **new product categories** and ecosystem strategies to compensate for stagnation in a mature market.
4. **Virtual and augmented reality** gain a foothold in niche operations and greater awareness among early adopters, creating opportunities for social VR experiences.
5. The differences between **on-demand and live viewing** continue to blur as consumers embrace a variety of OTT video services.
6. Consumers increasingly expect **connectivity in their cars**, but pricing, safety, and data privacy concerns inhibit market growth.
7. To cross the chasm, the smart home industry will continue to develop **new use cases** for security, peace of mind, and energy management.
8. Insurers are exploring **new business opportunities** in smart home products and services and will continue to launch trials and new partnerships.
9. **Wearables and smart watches** are expanding as healthcare tools and will be integrated with other IoT applications.
10. **Consumerization of healthcare services and devices** drives integration with smart home ecosystems and new business models.

Top 10 Consumer IoT Trends in 2017

Impact of IoT on Consumer Technologies

The Internet of Things (IoT) is driving the reinvention of consumer technologies. Connected products are taking on new form factors and providing new use cases, content providers are leveraging greater bandwidth to enable new content experiences, and data analytics offer solution providers a new source of customer insights to help them refine the user experience as well as develop next-generation products.

Improved product experiences are paving the way for increased product adoption.

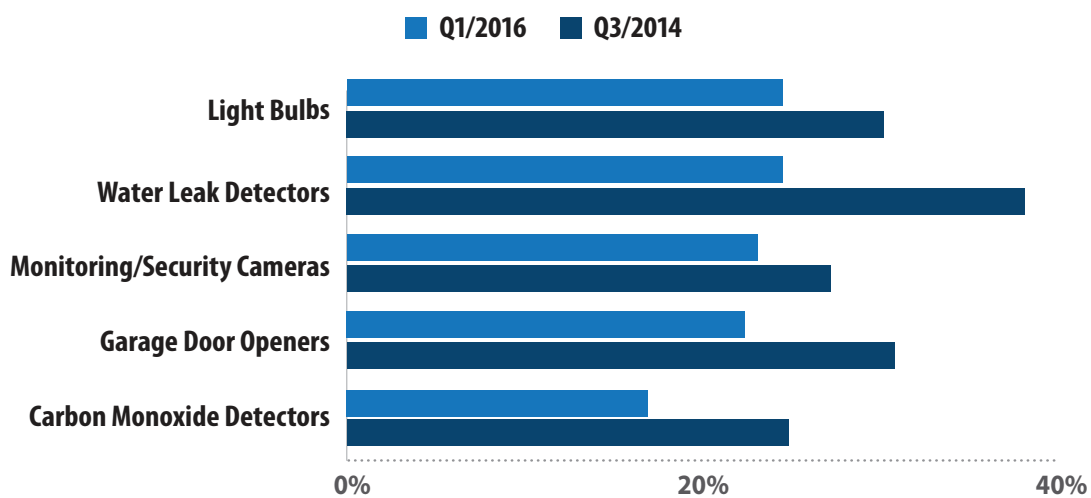
According to Parks Associates' latest research, in 2016 U.S. broadband households own an average of 8.1 connected computing, entertainment, or mobile devices, plus another 2.1 connected home devices. More than one-third of consumers own a connected health device, and over 63 million broadband households subscribe to an OTT video service.

The IoT industries have overcome several hurdles to reach this point. For one, the setup and out-of-the-box experience has simplified for individual devices. For example, only 4% of connected healthcare device owners reported problems when setting up their devices. For smart home devices, as adoption has increased, the number of owners reporting technical problems with their devices, from setup to ongoing operation, has declined, indicating the user experience with these products is improving.

In early 2016, 57% of U.S. broadband households that own a smart home device reported having no setup problems, while 52% reported no problems in 2015.

Smart Home Devices: Technical Problems Experienced (2014-2016)

Among Smart Home Device Owners



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While the percentage of self-reported setup problems is fairly high at more than 40%, the trend toward fewer setup issues is a success for the tech support industries and a positive sign for the IoT markets overall. Connected technologies have improved to the point that devices are easy to set up and use, but the vision and value of the IoT and connected home, built on the exponential increase in connectivity, require integration on a deeper level.

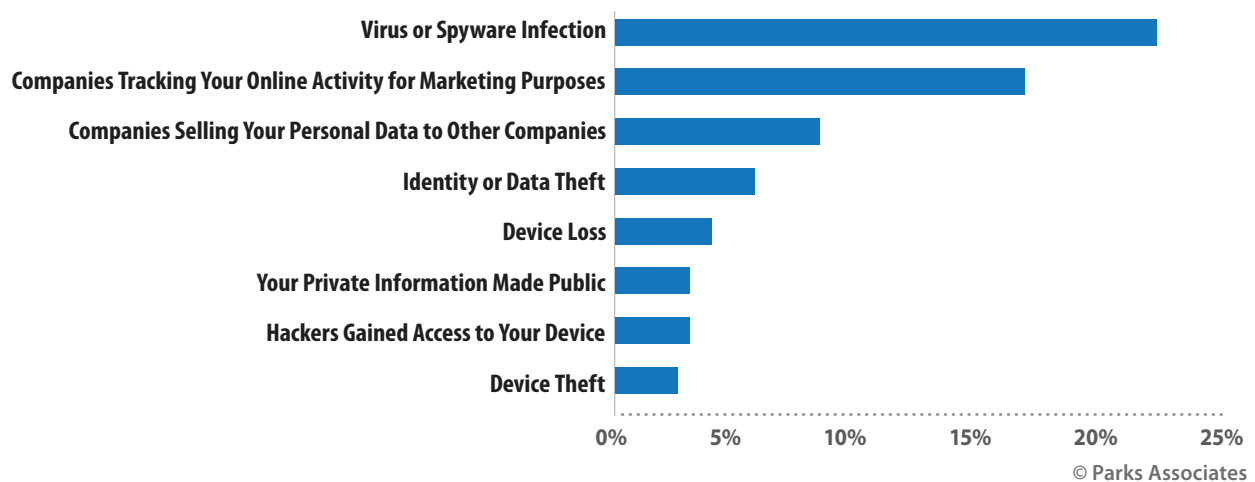
By 2025, consumer interaction with the devices and services in their lives—at home, in the car, on the go—will be dramatically different.

Connected devices will be ubiquitous and seamlessly integrate thanks to advances in artificial intelligence and cloud services. Many of the technical challenges to achieve this vision have been resolved, but many issues on the consumer side, impacting awareness and adoption, remain.

45% of U.S. broadband households, including both owners and non-owners, are very concerned that someone will get unauthorized access to a smart home product/device.

The IoT industries will need to develop and deploy strong support and data protections to secure consumer privacy.

Security/Privacy-Related Problems Experienced in Past 12 Months U.S. Broadband Households



Players to Watch in 2017

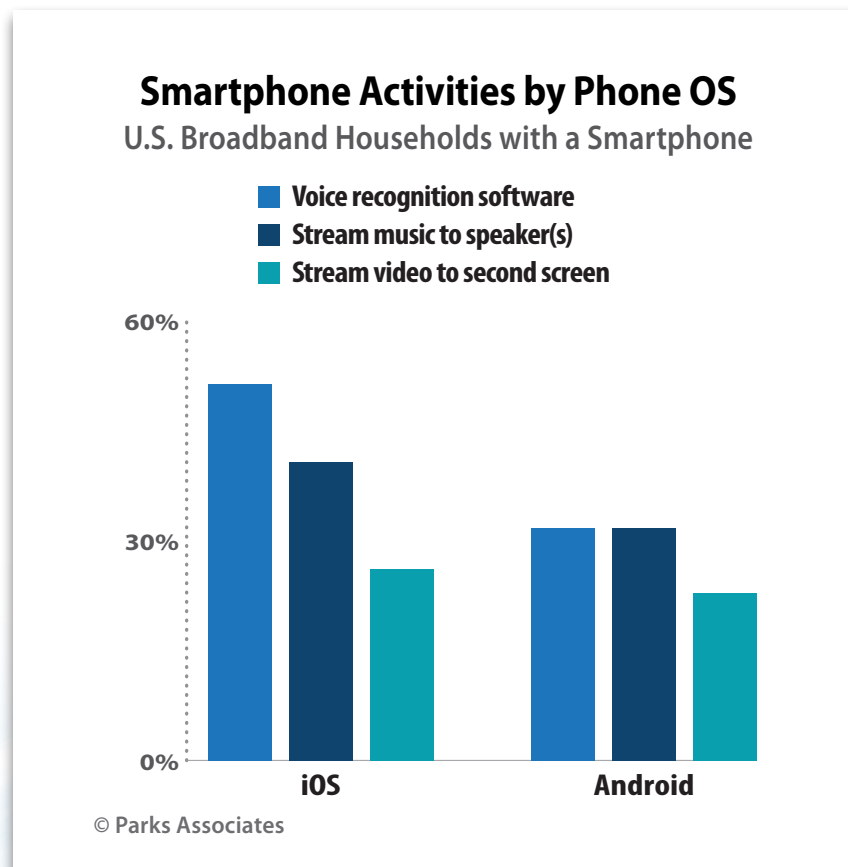
Asurion	Geek Squad
Bask	HelloTech
Dixons Carphone	

Voice control is vying to become the primary user interface for the smart home and connected lifestyle.

Almost 40% of U.S. smartphone owners use voice recognition software, a figure that increases to 46% of millennial smartphone owners. Siri and Google Now are seeing increased usage for queries and contextual information push.

Voice recognition technologies are improving their accuracy and will eventually be able to interpret voice inflection and emotion. For instance, IBM's Watson technology can understand natural language questions and search for information; Watson also has the potential to learn over time. Google Now and Apple's Siri both use natural language to process information requests on mobile devices. Natural language processing is becoming widely available and voice recognition accuracy is increasing.

Overall, consumer satisfaction with the experience has been positive, leading the push of voice recognition to platforms other than the smartphone.



"The introduction of voice controls through solutions such as Amazon Alexa-enabled products has opened new possibilities in how consumers can interact with smart home products and services. As a result, we've seen a rush among major players to integrate with Amazon and other similar solutions that will create new avenues to engage consumers with the smart home."

- Tom Kerber, Director, IoT Strategy

Voice control is extending to many devices in the home.

Amazon Echo, a smart speaker with a voice-controlled personal assistant, has shaken up the connected entertainment and smart home industries. The device streams music and uses natural language to handle a number of pre-programmed retrieval tasks (e.g., alarms, lists, weather, music, traffic) as well as to answer questions based upon Wikipedia. Users can even shop for insurance using their voice.

Amazon is aggressively building a large number of partners for its Echo device ecosystem and Alexa voice-control solution. Its partnerships with multiroom audio manufacturers such as Sonos create a home audio solution with voice control in every room.

Google also has a voice-activated speaker, Google Home, which is powered by Google Assistant. Google Assistant integrates Google search with personal user information to answer users' questions and serve contextually and personally relevant information. Apple is expected to offer a similar solution powered by Siri.

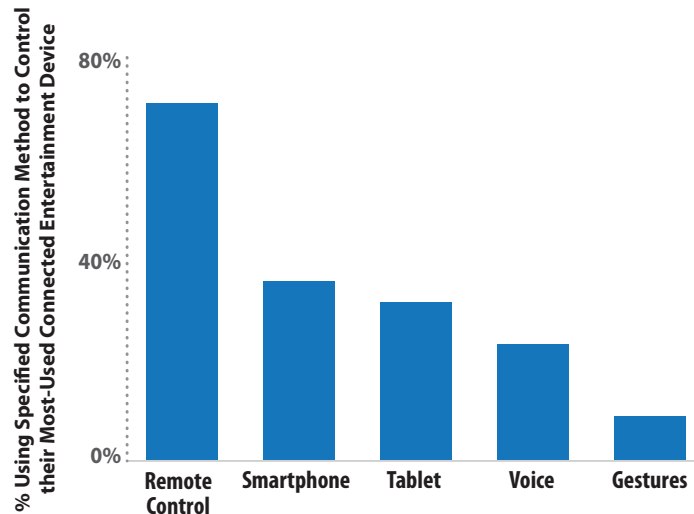
Voice control has emerged as a highly desirable interface, and developers in the smart home, entertainment, and connected car ecosystems are pursuing partnerships to add voice control to their solutions.

Alarm.com and Vivint have announced integration with Amazon Echo to provide users with a voice-control experience. Some production home builders have begun offering smart home systems to their customers—and some of these systems include (or will soon include) audio solutions. For example, Lennar now offers the Nexia Home Intelligence line to its new homeowners. Like others in the smart home space, Nexia has added voice-control capabilities through its mobile app.

Right now, traditional means of control—like the remote control for entertainment devices, key pads for security systems and thermostats—dominate the connected home, with smartphones preferred for remote device interaction; however, more than one billion voice-enabled devices will be sold by 2021.

Communication Methods Used to Control Entertainment Devices

U.S. Broadband Households with Two or More Entertainment Devices Connected to the Internet



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Players to Watch in 2017

Alarm.com	LG
Amazon	Microsoft
Apple	Nuance
August	Roku
Google	Vivint



The smartphone market plateaus, and mobile carriers experiment to retain subscribers, which will threaten fixed broadband services.

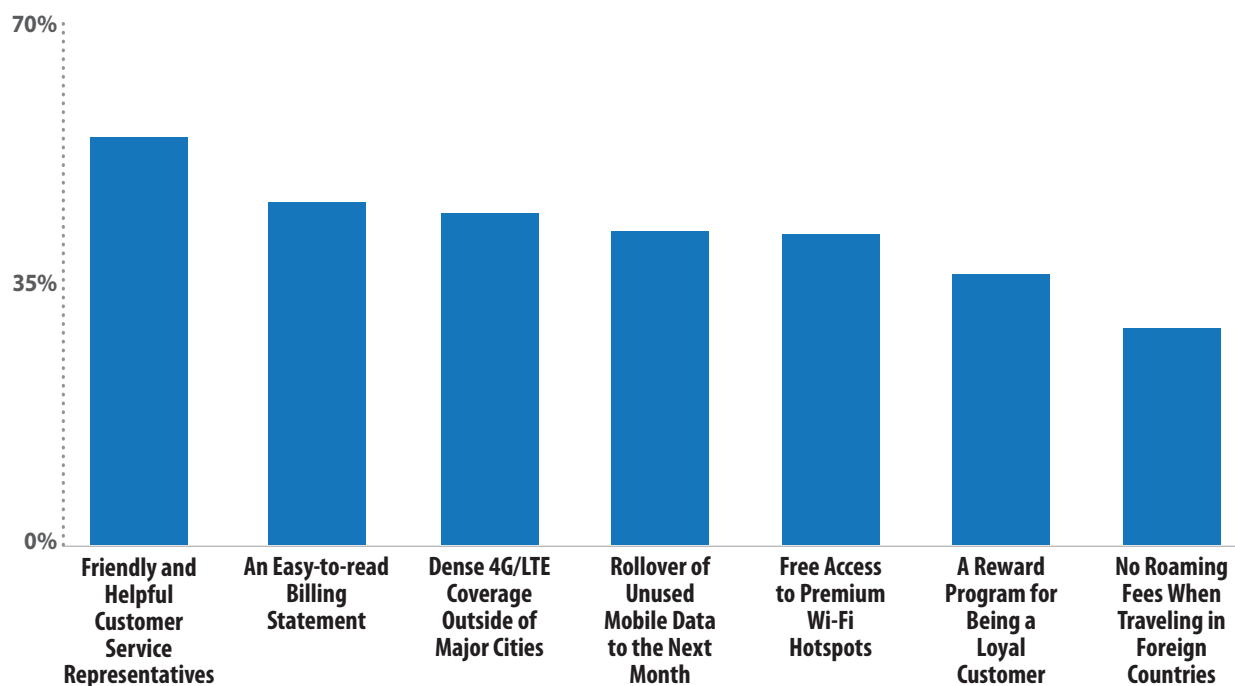
The U.S. smartphone market hit a saturation point in 2014. Adoption rates are holding around 80%, and the replacement cycle is lengthening.

Mobile carriers are searching for new growth areas and are competing fiercely for subscribers. As a result, they are changing the terms for their data plans at an unprecedented rate. For example, AT&T is leveraging its acquisition of DIRECTV to push mobile data and entertainment bundles.

Other benefits, such as unused data rollover, free access to premium Wi-Fi hotspots, and loyalty rewards programs, are appealing to likely mobile service switchers. Lengthy contracts that help limit upfront costs are less appealing to consumers, and carriers are phasing them out of their offerings.

Important Factors in Selecting Next Mobile Service Provider

U.S. Mobile Service Subscribers



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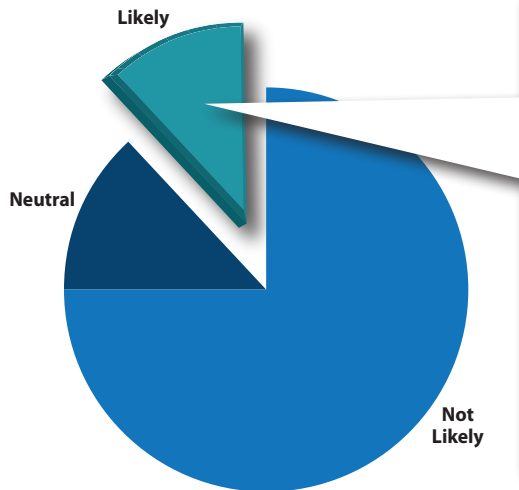
"Mobile operators in the U.S. are aggressively marketing mobile data plans and services to existing customers and customers from competing operators. As consumers demand data rollover and seek access to more mobile data without paying too much, operators must find ways to meet consumer demand to stay competitive. However, frequent data plan changes could backfire if consumers find data plan rules confusing to follow."

- Harry Wang, Senior Director of Research

All carriers are experimenting with marketing tactics to entice customers to switch providers, upgrade their data plans, or increase satisfaction. As wireless carriers experiment with new service offerings, they will emerge as new threats to fixed broadband services. **As of mid-year 2016, 10% of U.S. broadband households are likely to cancel their broadband service over the next 12 months because they have mobile data services.**

Do You Plan to Cancel Your Broadband Service and Use Only Mobile Data Service?

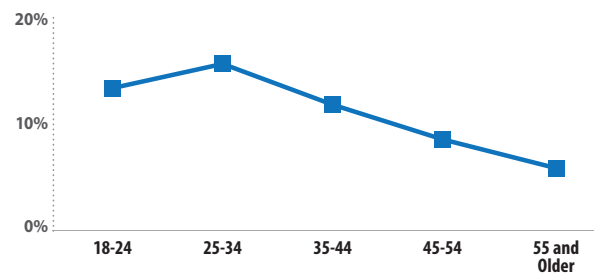
U.S. Broadband Households with Fixed Broadband Service



© Parks Associates

Likely to Cancel Fixed Broadband Service in the Next 12 Months and Use Only Mobile Data Services

U.S. Broadband Households with Fixed Broadband Service



© Parks Associates

As data service offerings and upgrades reach a stalemate, mobile carriers will start to develop bundled packages that include entertainment services (e.g., Netflix) along with data plans that offer zero-rated video streaming.

Offering tablets as a potential “add-on” to the wireless bundle could make the “cord-cutter” life even more appealing, which would capture ARPU currently going towards pay-TV and broadband service providers.

Players to Watch in 2017

AT&T Sprint Verizon
Wireless Broadband Alliance



“Video and entertainment will remain the key drivers for the future of consumer-oriented services. Video, virtual reality, and other entertainment experiences are data hungry. They will be the experiences that push consumers to higher tiers of broadband or mobile data.” - Brett Sappington, Senior Director of Research

CE manufacturers focus on new product categories and ecosystem strategies to compensate for stagnation in a mature market.

Mobile carriers aren't the only ones looking for new growth opportunities. CE device manufacturers continue to seek ways to move beyond razor-thin margins on mature product categories. For example, desktop adoption has declined from a peak of 91% down to 61% of broadband households; just 12% of households bought a desktop in 2015. TV purchases continue at a slow rate, with 4K doing little to inspire buying.

Annual purchases of flat-panel TVs have fallen from a high of 35% in 2011 to 26% in 2016.

With a decline in desktop computing and flat-panel TV purchases and the plateauing of the smartphone and tablet markets, CE makers must look elsewhere for growth opportunities.

Amazon generated lots of attention to its Alexa brand with announcements at CES® 2016 and celebrity-fueled commercials during the Super Bowl, and the company has followed up with diversification in device types with Tap and Dot.

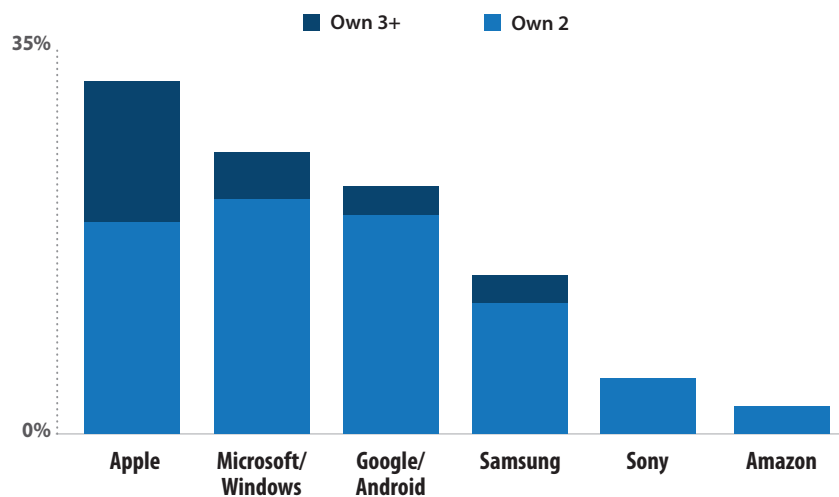
The personal assistant device market is still in its early stages, but Google has already entered the market, with Apple not far behind.

Wearable form factors like fitness bands and smart watches are another growth opportunity:

- 11% of consumers in U.S. broadband households reported owning a smart watch in Q2 2016, up from just 6% in Q1 2015.
- 12% of consumers in U.S. broadband households reported owning a fitness tracker in Q2 2016, up from 6% in Q2 2014.

A key strategy for CE manufacturers is to build product ecosystems that have cross-platform functions as well as cross-marketing opportunities.

Users of Multiple CE Products by Brand
U.S. Broadband Households



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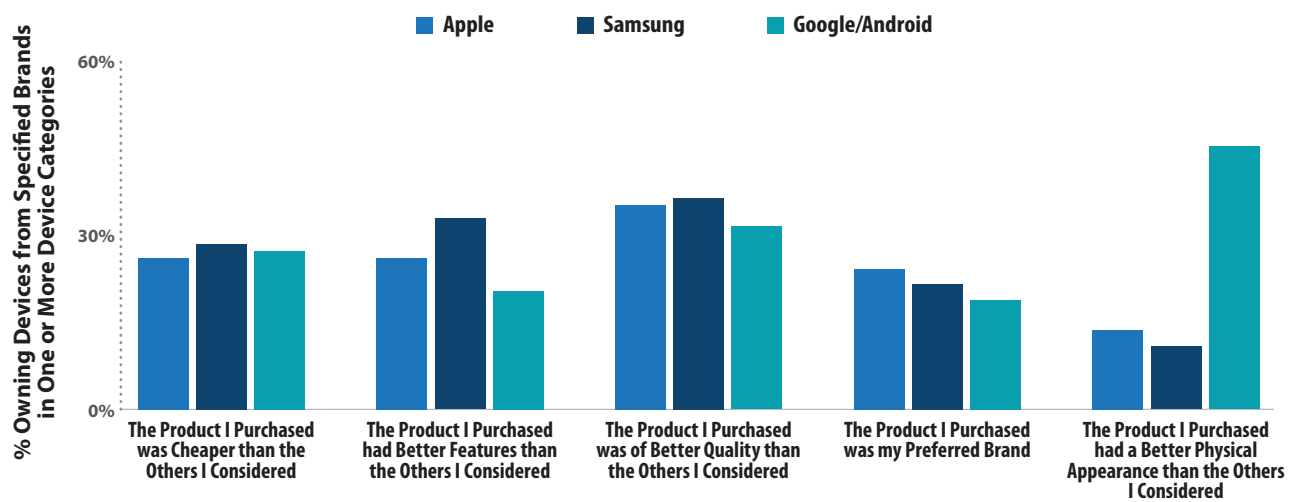
"New players and product categories are emerging in consumer electronics, challenging the traditional players that have deep pockets and established distribution channels. Online giants like Amazon and Google have the scale and technology capabilities to take risks in new areas of innovation. In some cases, these innovations are transforming whole sectors within the connected home." - Brett Sappington, Senior Director of Research

Apple is a clear leader in brand loyalty—consumers are more likely to own multiple CE products from Apple than from other CE brands. This multiplatform ownership is concentrated in the company’s mobile products, the iPhone and iPad, but the company is also seeing a bump in its computer adoption, which recently topped one-fourth of U.S. broadband households after lingering at 10% for many years.

Creating an effective, brand-oriented ecosystem is difficult to achieve. Samsung, Sony, Amazon, and others have sought to develop device ecosystems similar to those created by Apple, though with limited success. Samsung has achieved some success in developing brand affinity within its mobile devices, but that affinity has not extended to televisions or other devices. Amazon has achieved some synergy between its tablet and Fire TV customers.

Reasons for Purchasing One Brand Over Others Among CE Brand Loyalists

2015 U.S. CE Device Buyers Who Own 2+ Devices of One Brand but Considered Multiple Brands in Purchase Decision



© Parks Associates



“CE strategy transcends any one product. Leading brands build ecosystems of products and platforms, hoping to win consumer loyalty.”

- Hunter Sappington, Researcher

Players to Watch in 2017

Amazon	HTC	Snapchat
Apple	LeEco	TiVo
Google	Samsung	

Virtual and augmented reality gain a foothold in niche operations and greater awareness among early adopters, creating opportunities for social VR experiences.



"VR is an immersive experience, and the industry is only in the earliest stages of leveraging this new technology. Content producers are still learning the best ways to tell stories and entertain viewers through VR. Many are using VR to promote more traditional content, while others are using VR and 360-degree as its own medium, creating standalone experiences that are unique from video entertainment options today."

- Brett Sappington, Senior Director of Research

The emerging technologies of augmented and virtual reality continue to pique the interests of consumers and companies alike, with major players such as Google, Facebook, Intel, Microsoft, Fox Sports, and many others investing in devices, content, and distribution.

Virtual reality (VR) headsets in particular have captured a great deal of attention:

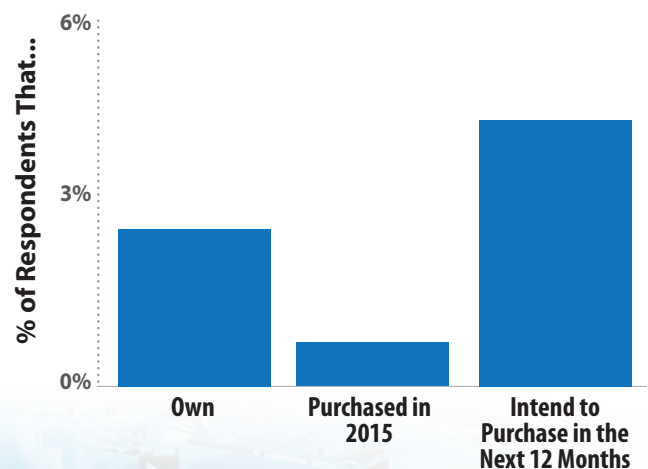
- VR headsets first became available to consumers in late 2015, and at the end of 2016, consumers now have multiple headset options to consider.
- 4% of millennials (heads-of-household ages 18-34) own a VR headset, and 8% of millennials plan to purchase a virtual reality headset in 2016.
- 2% of U.S. broadband households, or 2.3 million households, own a virtual reality headset.
- 8% of millennials show high familiarity with augmented reality, compared to 3% for Generation X and just 1% for baby boomers.

Companies in the entertainment IoT space are watching VR and augmented reality (AR), observing the evolution of content creation, monetization, and content distribution for these technologies. There were some initial concerns that the surge in VR interest would follow the same parabola pattern as 3D TV, where interest and activity spiked quickly and then declined with the same rapidity. Holiday purchases of VR hardware will be a good indicator of the technology's trajectory in 2017.

Parks Associates analysts predict VR, combined with social media experiences, will grow far beyond 3D TV's false start.

Virtual Reality Headsets: Adoption, Purchase, & Intention to Purchase

U.S. Broadband Households



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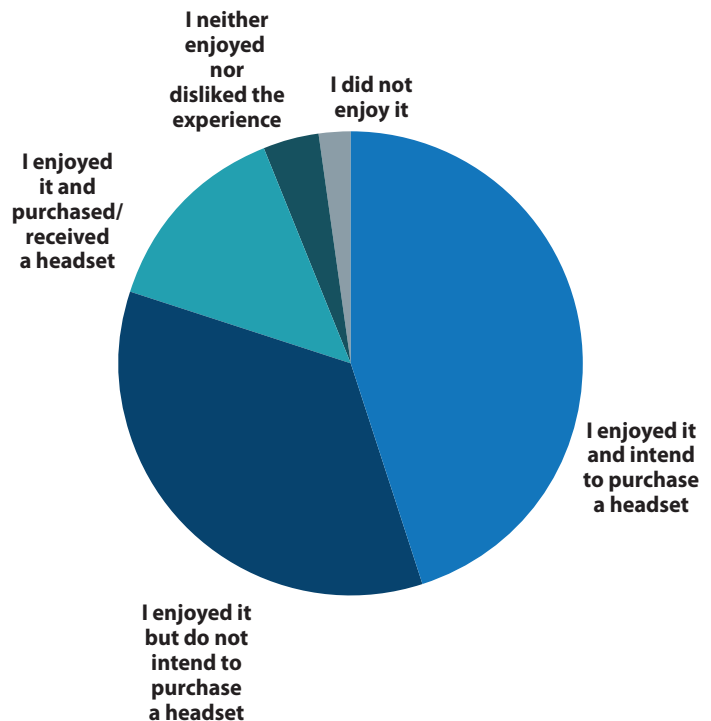
Augmented reality enjoyed a quick start and high initial awareness but still lags VR in technology support and content. The key to wider adoption for both AR and VR is for people to experience these technologies firsthand. Pokémon GO exposed millions of smartphone users, particularly millennials, to AR. Yet, following brief, rabid interest in the summer of 2016, uncertainty remains as to whether its success can be sustained or replicated.

In 2017, companies will continue to experiment and develop AR and VR content with hopes of finding the content or killer applications that will make AR or VR a “must-have” technology.

Despite interest and excitement behind AR and VR, the industry must overcome technology obstacles that are hindering growth. Multiple companies have created unique VR headsets, each with software that is often incompatible with others. This fragmentation forces content and apps to be customized to each type of headset, affecting cost, availability, and distribution of content. VR content has higher data requirements than traditional content. Latency in VR can potentially produce motion sickness, alienating consumers from the technology.

User Experience of Virtual Reality Headsets

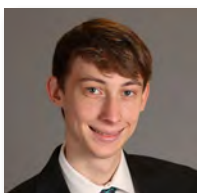
U.S. Broadband Households That Have Tried a Virtual Reality Headset



© Parks Associates

Players to Watch in 2017

Google	Oculus
HTC	Samsung
Magic Leap	Sony
Microsoft	



“It is difficult to explain the merits of VR to someone who has never experienced it before. The key to wider adoption is for people to experience these technologies firsthand. In 2016, almost half of consumers who tried a VR headset enjoyed it and intended to purchase, while 15% enjoyed it and purchased or received a headset. Demos and promotions that expose consumers to VR will go a long way towards growing the market.”

- Hunter Sappington, Researcher

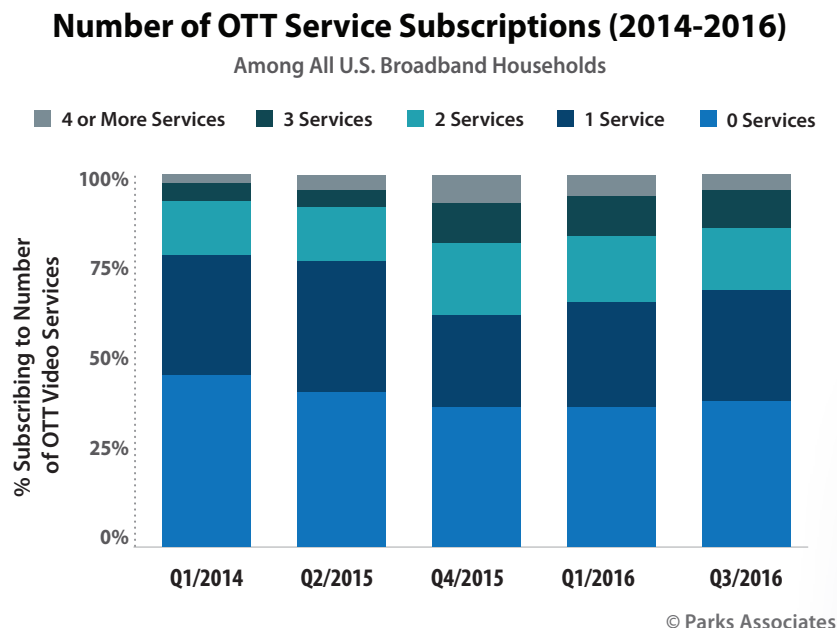
The differences between on-demand and live viewing continue to blur as consumers embrace a variety of OTT video services.



“The OTT space has evolved from a repository of licensed library content to a market for high-quality original content, much like how the premium TV network space developed from the late 1990s into the 2000s, and OTT providers are being rewarded for their efforts. To date, Netflix has won 24 Primetime Emmy Awards, and Amazon has won 11 Emmy awards. These services are also using their signature shows, including *House of Cards* (Netflix), *Transparent* (Amazon), and *Orange is the New Black* (Netflix), to sell subscriptions. Netflix already plans to expand its originals budget, and other large OTT players are sure to do so as well.” - Glenn Hower, Senior Analyst

Many OTT watchers have kept their pay-TV subscriptions because they are video enthusiasts, but churn rates for OTT services are high. Many OTT subscribers sample different services and then drop new services as they emerge. Market leader Netflix has avoided this trend, due in part to its high Net Promoter Score (NPS) and early commitment to original content (e.g., *House of Cards*, *Orange is the New Black*), along with its status as one of the longest-tenured OTT services on the market.

With the exception of Netflix and Amazon Prime, OTT services are experiencing churn rates exceeding 50% of their subscriber base.



- 5% of U.S. broadband households cancelled Netflix in 2015, up from 4% of households reporting in Q2 2015 that they cancelled the service in the past 12 months.
- 14% of U.S. broadband households subscribe to Hulu, and 7% of U.S. broadband households cancelled the service in 2015, roughly the same churn rate from Q2 2015.
- 24% of U.S. broadband households report having a subscription to Amazon so that they can stream video. The churn rate for Amazon's video service declined slightly from Q2 2015 to the end of 2015.

High churn rates will continue through 2017.

Right now, 31% of U.S. broadband households subscribe to more than one OTT video service. These consumers are called “service stackers,” and very often, they have one firm and one fluid subscription, as they are experimenting with another emerging OTT service.

The commitment to quality programming through original content has also helped OTT providers gain a significant foothold in the living room.

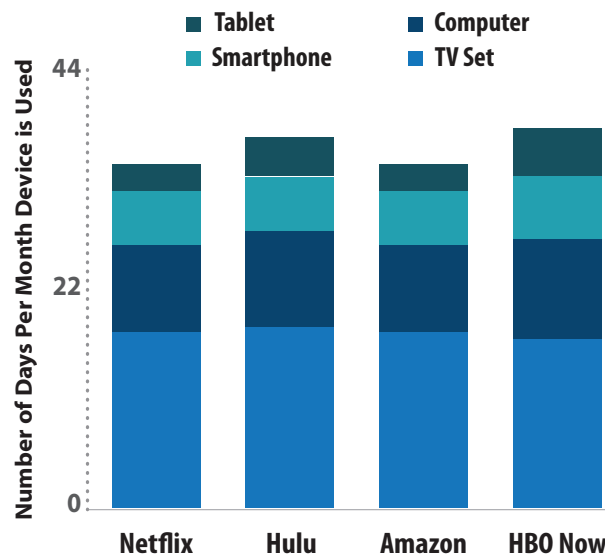
When it comes to visual media viewing, the largest screen possible is preferable. As OTT viewing takes on a bigger role in a household's entertainment with premium long-form original TV series and movies, the more the TV is used as an OTT delivery device. OTT users watch these services on their TV screens between 17-20 days per month, much more than platforms such as a PC, smartphone, or tablet.

This trend toward normalization of OTT services to be a standard part of viewing habits will continue through 2017 as more linear OTT options become available through providers such as DIRECTV and Charter.

With so many well-publicized service launches planned in 2017, there will also be another surge in OTT sampling, with the number of consumers subscribing to three or more services rising again. If this expected surge in service stacking does not occur, it would indicate that consumers overwhelmed by the number of choices or tired of the effort in service juggling. In this case, the incumbents stand a better chance of maintaining their market positions.

Frequency of Device Use for Internet Video by OTT Video Service Subscribers

Subscribers of Specified Service in U.S. Broadband Households



© Parks Associates

Players to Watch in 2017

Amazon	Hulu
AT&T/DIRECTV	Netflix
CBS	Sling TV
Crunchyroll	WWE Network
ESPN	

Consumers increasingly expect connectivity in their cars, but pricing, safety, and data privacy concerns inhibit market growth.

The lack of integrated, in-car connected features in the majority of vehicles on the road today forces drivers to use their smartphones in cars—a clear driver distraction issue.

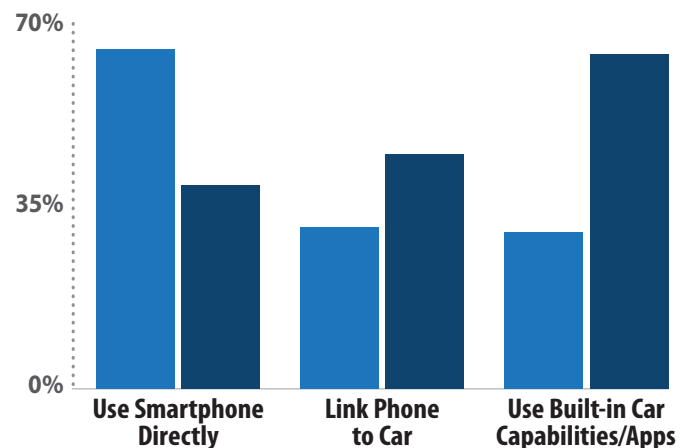
When looking to their next car purchase, consumers prefer to have built-in access to connected voice, text, and app services.

Sixty-four percent of car owners in U.S. broadband households who own a smartphone want embedded access to connected car features in their next vehicle, while 45% want to access these features through a tethered/mirrored smartphone experience. Just 39% indicate a desire to continue using their smartphone directly for at least one activity.

Current and Preferred Future Method for Connected Car Activities

Car Owners in U.S. Broadband Households Who Use a Smartphone

- Perform at least one activity with this method in current vehicle
- Prefer this method for at least one future activity in next vehicle



© Parks Associates

These findings point to significant pent-up demand for connected car solutions. However, when it comes to paying for services, most consumers do not yet value car connectivity at the same level at which they value mobile connectivity. In fact, the ubiquity of smartphones may limit consumers' willingness to pay for an additional connection in the car.

The entry of technology players such as Apple and Google into the connected car space is forcing many OEMs to open their ecosystems, speed up innovation, and provide a superior user experience for their in-vehicle infotainment (IVI) services. Apple CarPlay and Android Auto also provide OEMs a way to offer connected vehicle services to their customers without requiring a monthly subscription.

In U.S. broadband households, 65% of car owners who own a smartphone perform at least one activity on their smartphones without a car connection while driving.



"The connected car market is one of several consumer IoT markets. Connected car players need assets, partnerships, or both across adjacent connected ecosystems, such as the smart home and smart cities. Consumers will gravitate towards connected solutions that ultimately enhance their lifestyles wherever they are."

- Jennifer Kent, Director, Research Quality & Product Development

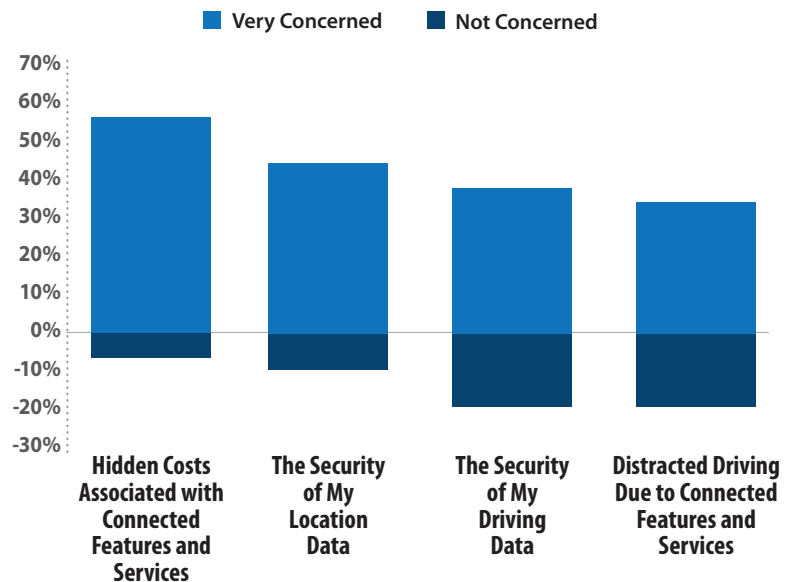
Fear of hidden costs and privacy concerns could be significant barriers if the auto industry does not address them directly.

Fifty-eight percent of car owners in U.S. broadband households are very concerned about hidden fees associated with connected features and services. This ranks as consumers' top concern about connected cars, with data security following close behind. Nearly half are very concerned about the security of their location data, and 43% are very concerned about their personal driving data, such as speed, mileage, hours driven, and location.

These findings are warning flags—connected car service providers must be fully transparent about costs and fees and must reassure consumers that the data generated from connected car features will not be used by unauthorized parties or in objectionable ways.

Consumer Concerns about Connected Cars

Car Owners in U.S. Broadband Households



© Parks Associates

Giving consumers the ability to easily delete their data is a dramatic but clear way to ease concerns about privacy and data vulnerabilities.

Players to Watch in 2017

Apple	Harmon
AT&T	Panasonic
Audi	QNX
BMW	Samsung
Ford	Tesla
Google	Vodafone
GM	

By 2021, 61% of all light vehicles in the U.S., 183 million cars, will have a connectivity solution.



"Auto makers must look beyond direct consumer-pays models to justify connectivity costs. Connected infotainment solutions are currently often justified as a loss leader but also a differentiator to help drive vehicle sales. Business models are not yet stable; experimentation will continue for the short and mid-term." - Chris Tweedt, Research Analyst

To cross the chasm, the smart home industry will continue to develop cases for security, peace of mind, and energy management.

“Hero” products—like the Nest Thermostat or Amazon Echo—have found an enthusiastic user base, but most consumers are unfamiliar with smart home products and services. **Only about 13% of U.S. broadband households are familiar with smart home products, and only 14% are familiar with where to buy smart home products.** Despite years of collective marketing, most consumers are also unfamiliar with utility programs. **Less than 20% of U.S. broadband households are aware of energy-efficiency programs from their utilities.**

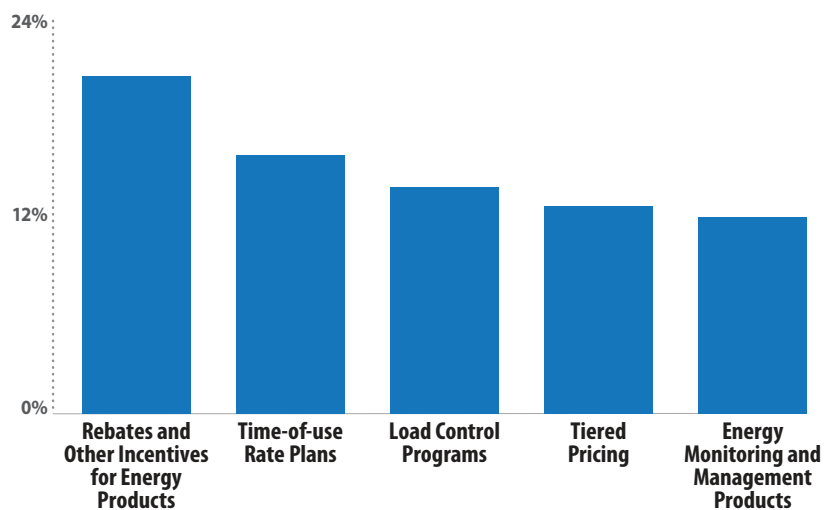
Consumers are willing to take action to save energy—over 60% of U.S. broadband households strongly believe that saving energy and lowering utility bills are important.

The smart home represents a new opportunity for utilities.

By taking advantage of the strong growth of smart home solutions, utilities can accelerate adoption through energy programs that incentivize adoption and in doing so raise awareness of energy programs and the broader smart home market. Joint marketing efforts help both utilities and smart home solution providers achieve their objectives.

High Familiarity with Energy Programs Offered

U.S. Broadband Households



© Parks Associates



“The energy provider has an opportunity to leverage smart home solutions for demand response and energy-efficiency initiatives, and the customer has a lot to gain from increased control, comfort, and convenience.” - Tom Kerber, Director, IoT Strategy

The security market continues to be the leading channel for smart home products and systems. The consumer value proposition of home security is clear. In addition, consumers quickly understand how smart home products and services can extend the value of security.

Among U.S. broadband households with a home security system, the ability to protect one's home while traveling is the top driver for their security purchases.

Remote access capability is very influential in motivating their security purchases—

nearly 40% of home security households claim this feature as a key driver for their security ownership.

Nearly 25% of U.S. broadband households have a working and active security system, and 65% of these households plan to buy a smart home device within the year.

Parks Associates analysts expect that almost 55 million smart home devices will be sold to U.S. broadband households in 2020. However, privacy and security remain an issue that the industry must aggressively address.

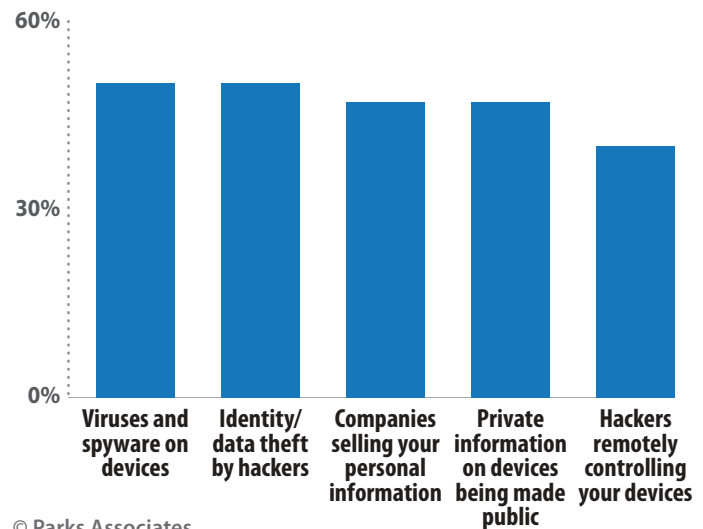
Controlling the message is key. What seems like a continuous series of negative news stories about the latest hack will certainly impact growth. In the latest story, from late 2016, hackers exploited IoT devices like networked cameras, Wi-Fi routers, and smart lighting systems with a malicious botnet that performed a denial-of-service attack on high-profile websites.

Currently 76% of broadband households express high levels of concern about security/privacy when using any of their connected devices. Forty percent of broadband households are specifically concerned about hackers remotely controlling their devices.

Collaboration to ensure best practices are followed by everyone may be needed to assure that overall, the smart home industry comes out from under the cloud of bad press and communicates a clear message of privacy protection and data security.

Top Five Most Common Security/Privacy Concerns

U.S. Broadband Households



© Parks Associates

Players to Watch in 2017

ADT	McAfee
Amazon	Nest
Google	Savant
Irdeto	Verimatrix
Lutron	Vivint



“The smart home is still in a stage in which the primary perceived value is in the convenience of home automation. Consumers do not yet conceive of devices collaborating or sharing data to deliver more intelligent services. More complex and less obvious use cases, such as multiple energy-related devices working together, will require consumer education efforts. Bundling of complementary devices can also help consumers see their interoperability benefits more clearly when promoted with careful messaging about the enhanced savings or safety they can achieve together.” - Brad Russell, Research Analyst

Insurers are exploring new business opportunities in smart home products and services and will continue to launch trials and new partnerships.

The insurance industry is an emerging player in the IoT space.

Access to connected device data can give insurers access to real-time data and the ability to prevent loss and mitigate damage. Parks Associates research indicates strong consumer interest for solutions that alert them to potential damage or safety hazards::

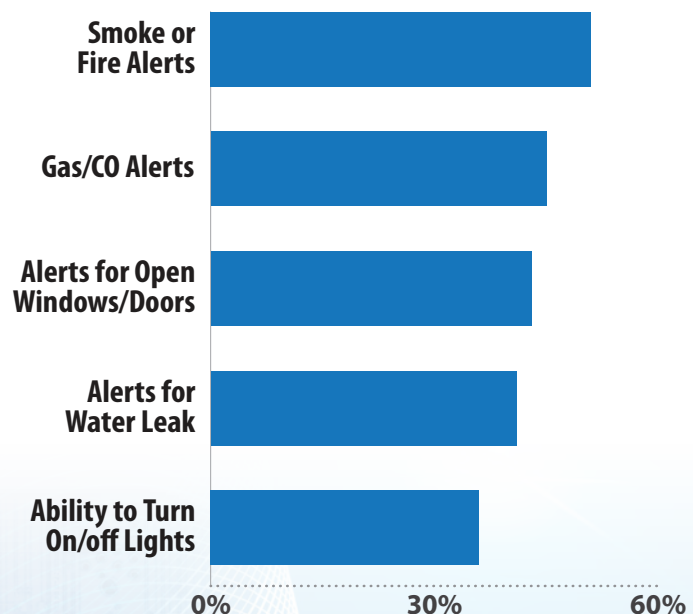
- 51% of U.S. broadband households find an IoT device that alerts them to smoke and fire highly appealing.
- 41% of U.S. broadband households find a device that alerts them to a water leak to be highly appealing.

Insurers in the home, property, auto, and health markets also gain valuable insight into customer behaviors through connected device data. They can use this new feedback loop of information to create new programs that leverage connected home data and devices to reduce damages, lower the number of claims, and give them better access to repair and damage prevention services.

At the end of 2016,
26% of U.S. broadband households
had adopted a
smart home device.

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Appeal of Smart Home Use Cases for Home Protection U.S. Broadband Households



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"Companies need to forge creative strategies and unique partnerships to help drive growth in IoT-based insurance solutions. The partnership between insurer Allianz and global manufacturer Panasonic is a prime example of an entry-level smart home solution, the Smart Home + Allianz Assist, which builds a strong security use case and promotes future add-on sales." - Tom Kerber, Director, IoT Strategy

Currently several insurers offer discounts or incentives for consumers to acquire smart home devices. For example, State Farm offers a policy incentive to install a Canary home security monitor, while Liberty Mutual offers a complimentary Nest Protect smoke detector.

This trend will expand from device promotion into insurer-branded programs. Areas of coverage will also extend further into the connected health market. Home monitoring can be a cost-effective method to continue treatment for chronic care patients and the elderly; however, a key challenge is to ensure compliance. Emerging IoT solutions such as networked cameras, wearables, and even in-home robots could help monitor and treat the aging-in-place population while keeping the elderly safe at home, reducing expenditures, providing tools for caretakers, and potentially lowering insurance payouts.

For the smart home to be a “win” for insurance, they need to understand the unique needs of the insurance industry and offer solutions that meet the needs of both insurers and consumers.

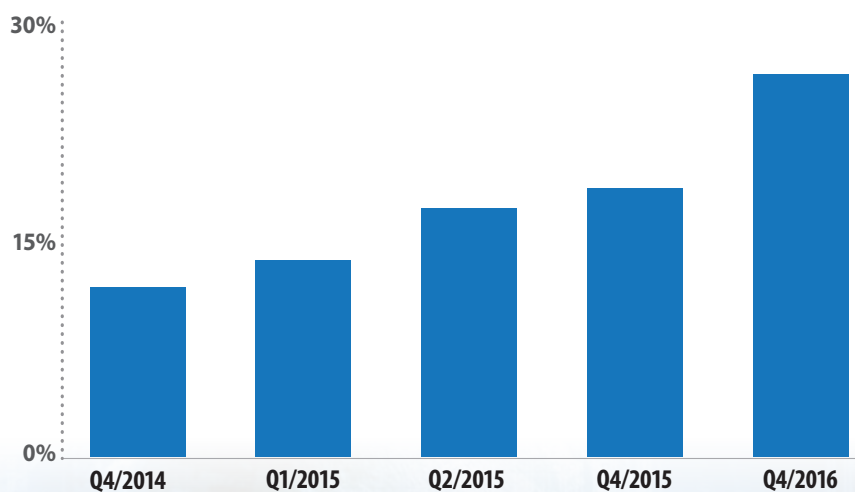
Roughly 50% of U.S. broadband households are concerned about sharing their data, so smart home solution providers and insurers need to develop transparent policies related to data collection and use.

Players to Watch in 2017

Allianz	Progressive
Canary	ROC-Connect
EVRYTHNG	State Farm
Nest	Travelers

Smart Home Device Ownership (2014-2016)

U.S. Broadband Households



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Top 10 Consumer IoT Trends in 2017

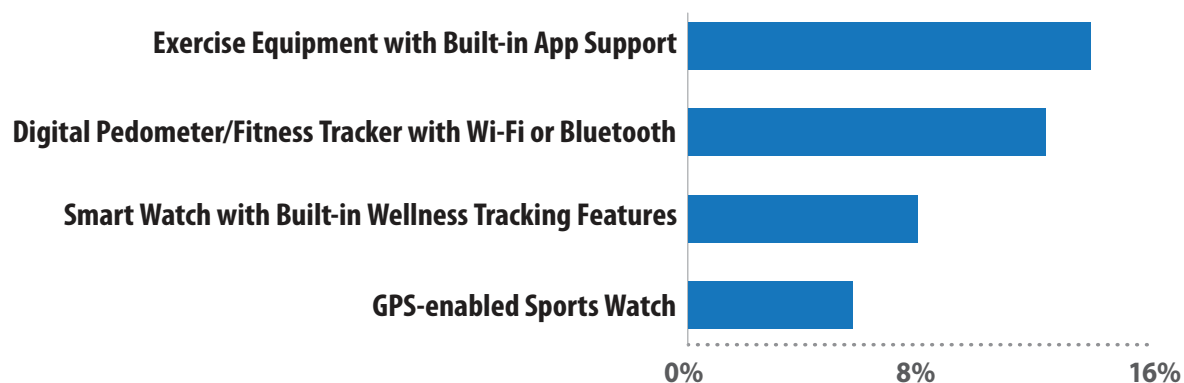
Wearables and smart watches are expanding as healthcare tools and will be integrated with other IoT applications.

The market for smart watches, and for wearables overall, is in the early stages. Only 11% of U.S. broadband households have a smart watch, but there are significant growth opportunities for both manufacturers and app developers.

Smart watch ownership jumped when Apple entered this market, and the company currently has approximately 40% of the market.



Adoption of Connected Wellness Devices U.S. Broadband Households



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Connected wearables help implement the new focus from healthcare reforms, which encourage more health monitoring and support outside of the doctor's office.

Consumers primarily use smart watches for health and wellness tracking (58%) and receiving notifications (57%). The next most frequent uses are replying to notifications (43%), checking the weather (39%), and making and receiving phone calls through their watch (37%).

Early consumer data comparing usage of smart watches vs. fitness trackers shows the former currently have an advantage regarding usage with sports and outdoor activities.



"Companies need to engage consumers for their healthcare solutions to be successful, and to do so requires knowledge to target consumers on an individualized basis. Such personal information includes social and attitudinal factors alongside accurate health risk assessment and effective engagement approaches. Wearables offer connected health companies access to such personal information."

- Harry Wang, Senior Director of Research

Among exclusive smart watch owners, 62% use the device while running and 30% for biking. In contrast, 50% of exclusive fitness-tracker owners use the device for running and 21% use it for biking.

Apple has taken notice of these use cases and looks to capitalize on its users' needs with the Apple Watch Series 2, which has GPS and water-resistant features to enhance these types of activities.

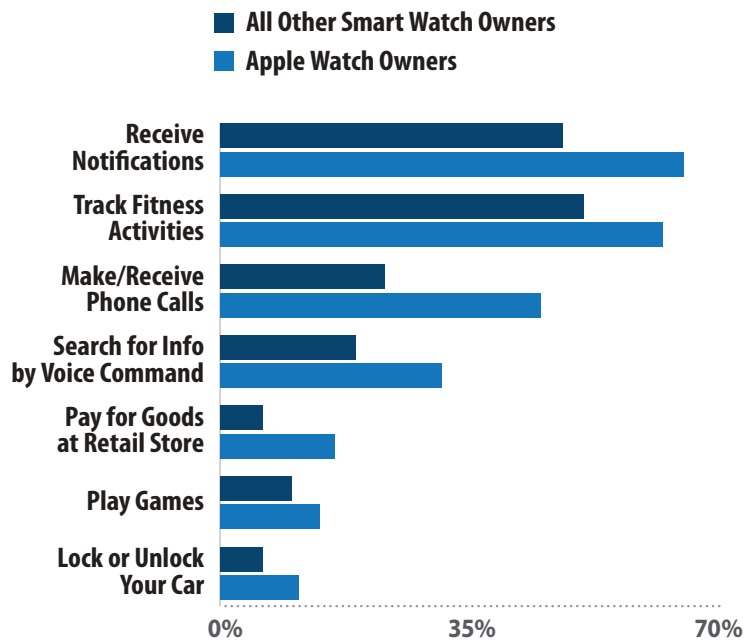
Wearables in general have generated interest in the IoT due to the easy access and immediacy of the platform, with applications in areas such as the smart home, insurance, and mobile wallets. Plus, wearables of all form factors collect some of the most personal and contextually relevant data available.

Going forward, smart watch app developers should focus on notifications and fitness tracking as primary app functions, with an eye to develop solutions in these emerging areas such as device control, insurance data, and mobile payments as adoption expands.

App developers will see emerging business models based on utilizing smart watch data to provide insurers with health and location information as auto manufacturers do with vehicles.

Weekly Smart Watch Activities by Brand

Apple Watch Owners vs. Owners of Non-Apple Smart Watches in U.S. Broadband Households



© Parks Associates

Players to Watch in 2017

Apple	Garmin
Coin	Misfit
Fitbit	Philips
Fossil	Samsung



"Health tracking and notifications are the primary consumer use cases for smart watches. Smart watches' easy accessibility and at-a-glance design are perfect for receiving quick notifications, and their health features capitalize on growing consumer interest in fitness tracking devices. Apps that facilitate these functions will likely be the most successful in the short term."

- Chris Tweedt, Research Analyst

Consumerization of healthcare services and devices drives integration with smart home ecosystems and new business models.

Currently 35% of U.S. broadband households own and use at least one connected health or wellness device, with 12% owning more than one.

Smartphone owners use numerous health-based apps both on their own and as required/incited by their employer or health insurer.

Connected healthcare is taking a more prominent role in the smart home as the smart home industry is exploring new use cases to drive consumer interest and forge revenue-generating partnerships. This trend has galvanized interest from a variety of players, including health insurers, device manufacturers, service providers, and app developers, for the potential to improve consumer care experience and generate new revenues from innovative services.

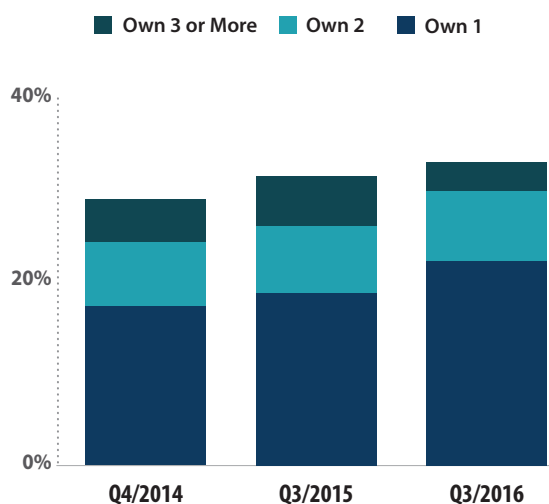
Revenue models in healthcare often deviate from the conventional home service provider revenue models, where a company charges a recurring monthly fee to its users.

This deviation is especially true for applications that touch a patient's health and require collaboration with healthcare professionals. As connected health solutions expand and are included in smart home solutions, healthcare players need to think "outside the box" to leverage these channels and experiment with new revenue models.

There are multiple connected healthcare business models being tested now, which will continue through 2017.

Health apps in the fitness tracking, diet management, and care coordination categories typically adopt a freemium model with an upgrade option to a paid tier. Apps or care platforms such as medication tracking apps or connected glucometers can promote complementary product or supply sales. Companies can also leverage partnerships to monetize lead generation. For example, a sleep tracking app may generate enough consumer interest in a sleep apnea test so that the app developer can monetize leads to a home sleep test kit vendor or a sleep clinic operator.

Number of Connected Healthcare Devices Owned
U.S. Broadband Households



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"Rising consumerism and pressure from government agencies and insurers to offer higher-quality services have prompted care providers to examine their practices with a more consumer-centric approach. The healthcare industry traditionally studied their patients from a cost and service utilization perspective, and the shift from the fee-for-service to the pay-for-performance models now incentivizes care providers to become more outcome-oriented and care-quality driven through effective consumer engagement." - **Harry Wang, Senior Director of Research**

As connected health apps and platforms drive positive changes in patient behaviors, and ultimately generate cost savings for healthcare providers or insurers, developers and manufacturers can build partnerships with insurers, hospitals, or other healthcare entities to get a share of the cost savings based on patient recovery progress and prevention of incidents that trigger a hospital readmission.

One other business model for connected healthcare is to monetize the data collected for health and medical research. Data collected from a connected health platform and cleared by end users for medical research purposes can be a goldmine for medical researchers and drug companies. This possibility also highlights the need for strong data privacy protections and usage rights transparency.

Consumers are already highly concerned about the vulnerability of their data—76% of broadband households express high levels of concern about security/privacy when using any of their connected devices.

Support for these devices needs to include strong security protections, and companies need to be transparent with consumers about their methods to secure user data. Nearly 50% of U.S. broadband households are interested in a support service that would remotely lock and/or erase data on a connected health device, including 30% who would find this service very appealing.

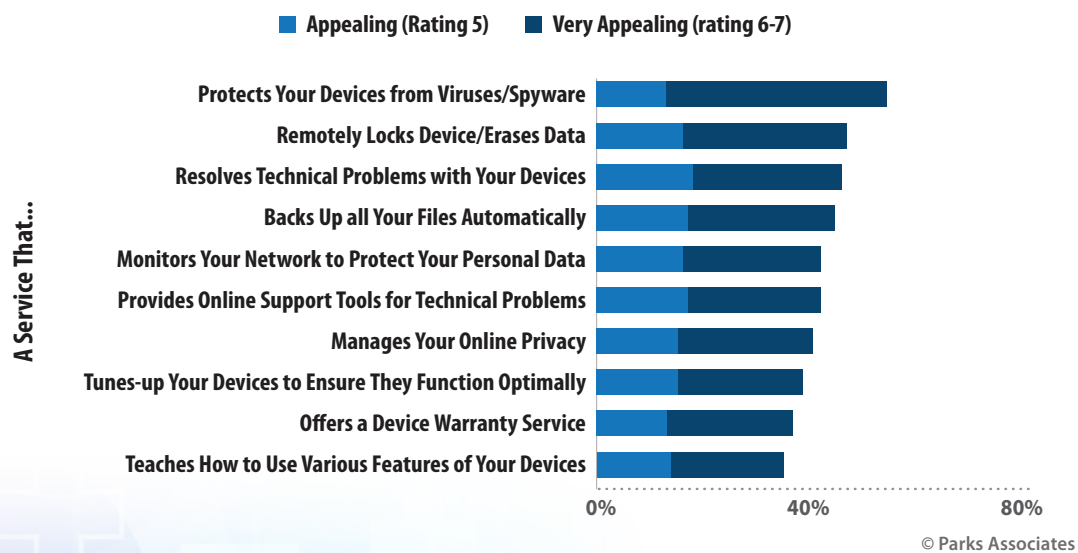
2017 will offer multiple opportunities for companies to expand healthcare service and also take the lead in protecting consumers and their data.

Players to Watch in 2017

GreatCall	Philips
Independa	Vivify Health
MDLIVE	Wellframe

Appeal of Support Services for Connected Healthcare Devices

U.S. Broadband Households



“As more consumers adopt connected healthcare devices, the demand for support services that protect these devices and their data will increase. Currently 54% of connected healthcare device owners find services that protect their devices from virus/spyware appealing, and 46% find a service that resolves technical problems with their device appealing. As connected devices handle more and more sensitive data, the tech support industry must evolve from a reactionary model to one that protects the consumer and ensures a positive experience.”

- Patrice Samuels , Senior Analyst

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