# Top 2016 Trends for the Consumer IoT

**A Parks Associates Whitepaper**

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# Connected Car

**64%** of U.S. car owners want connected ***activity built into*** **their next car**

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## Automakers Embrace Apple and Android

Currently most connected activities in the car are performed on the smartphone, with no connection to the car, but consumers want these connected activities to be more convenient when they are in the car. This demand has inspired solutions from Apple and Android, and automakers now accept the inevitability of the tech giants' presence in the vehicle. They are also unwilling to let these mobile-centric solutions serve as a differentiator for their competitors, so auto manufacturers are building support for Apple CarPlay and Android Auto into new vehicle models. These smartphone mirroring solutions will provide car owners with a familiar experience in the vehicle, though one that is adapted for safe, distraction-free driving.

## Connected Cars Lead the Way in Crossing IoT Boundaries

With the exception of smartphones, no other device ecosystem connects so many touchpoints across consumers' lives as does the car. Cars connect consumers' home and work lives and connect community residents with their local infrastructure. Car-generated data will increasingly enrich connected solutions outside the car, while also offering an interaction touch point for those external solutions from within the car. Over 40 million U.S. vehicles will be connected to the Internet by the end of 2015.

## Connected Technologies Enabling a Shift in Vehicle Ownership Models

New technologies and urbanization trends are making it possible for consumers to relieve themselves of the burden of vehicle ownership. Following the music and video industries, consumers – and Millennials in particular – will increasingly embrace a relationship with vehicles that is defined by experience, not ownership.

## Autonomous Driving Features Coming to Market System-by-System

Tech companies, auto makers, and Tier 1 suppliers are making progress towards the vision of fully autonomous vehicles. State and local legislatures have been wary of self-driving cars, though, with California drafting rules that would require a licensed driver inside a self-driving car. In the near term, semi-autonomous vehicles with specific systems that adapt autonomous features under certain environmental and road conditions will become reality.

## Privacy Concerns will Remain in the Headlines until Connectivity becomes Indispensable to Driving

More than 50% of U.S. broadband households express privacy and safety concerns regarding connected cars, and as more connected vehicles hit the road, creating a larger addressable market for hackers, privacy and security breaches will increase. Consumers and regulators will continue to focus on the issue until connected car features are ubiquitous and necessary to the driving experience. Only then will the consumer evaluation of the security/value trade-off relent, as it has with online banking, e-commerce, and other forms of connected living.

# Connected CE

## Gaming as Revenue Generator

Makers of smart TVs and streaming media devices are focused on gaming as having the most potential to increase alternate revenue streams. Revenue can be realized through game subscriptions, purchases, and rentals as well as in-game fees for add-on items or services and upgrades.

## Innovations in Streaming Media Players

Currently, 20% of U.S. broadband households own at least one streaming media cube player and 8% own at least one streaming stick. Streaming media sticks, such as Google Chromecast and Amazon Fire TV, will be the choice of consumers who want basic content streaming due to the low prices. Cube-shaped streaming media players, such as the Roku 4, Apple TV (fourth generation) and Nvidia SHIELD, are now premium players. While priced higher than sticks, the cube players offer more features as well as the latest innovations at prices lower than gaming consoles or smart TVs.

## Cloud-based Services vs. CE Hardware

Gaming consoles are the most commonly used in-home connected entertainment platform, but their usage has been trending downward with the rise of smart TVs and streaming media players. Cloud-based gaming and subscription gaming are also growing in popularity, enabling consumers to utilize smart TVs and streaming media players for higher-performance gaming. This will result in continued declines in traditional gaming console sales but will also open gaming up to new market segments. Because content is king, industry leaders such as Microsoft and Sony will continue to prosper, but hardware sales will be less crucial compared to ongoing services.

## 4K TV Adoption

Roughly 7.5% of U.S. broadband households planned to buy a 4K TV set by the end of 2015. 4K TV adoption will continue to increase as broadband households replace existing TV sets. Within the next two to three years, HDR is likely to be part of all 4K TV sets. HDR has the capability to increase TV sales beyond what 4K could do on its own, which has been limited by lack of available content and low consumer awareness.

## Drones

Drones are increasing in popularity and will be a big holiday seller; however, registration requirements, attention from governing bodies (including municipal leadership), and HOA and consumer concerns about privacy, security, and injury and property risk are all likely to dampen interest and usage. People will not look out their windows and see a sky full of drones on January 1, 2016.

## Virtual Reality Hardware

Virtual reality headsets, including the Oculus Rift and Sony PlayStation VR, are expected to be released in 2016. Sony will focus on gaming, while Oculus's parent company Facebook will focus on sharing and connections. Gaming will be the major initial use case for VR, but the innovation could be disruptive enough to attract non-gamers and expand the market. However, while VR is likely to expand to multiple devices with non-gaming entertainment use cases, it remains to be seen if the experience will be successful only until the "new" wears off or if the novelty evolves to be a consumer requirement over a longer term through the identification of compelling non-gaming use cases.

**Two-thirds**
of U.S. broadband households
connect at least one
**ENTERTAINMENT DEVICE**
to the Internet.

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# Content Licensing and Distribution

## International Licensing

As OTT video services like Netflix continue expanding overseas, acquiring the rights to distribute content over international borders is becoming increasingly important. Content is king for streaming services, and specific offerings need to be tailored for individual regions or even countries. The ability to balance local content offerings with international offerings will be a primary factor for whether or not a service achieves success in a given market.

## Exploiting Digital for Established Content Brands

Digital services provide established content brands with an avenue for new life. Beginning back when Netflix revived *Arrested Development* and continuing with the likes of *The Mindy Project* on Hulu and *Star Trek* on CBS All Access, digital services provide outlets for reboots, spin-offs, and continuations that would struggle to gain airtime on linear television. Creating content based on established brands is less risky than investing in untried stories. The success or failure of established brands on digital will determine if the trend continues through 2016, or if customers of digital services desire truly original content.

## Skinny Bundles

Bundling has been fundamental to service provider strategies, and triple-play penetration has increased by 50% or more since 2011 among the largest cable operators (Comcast, Time Warner Cable, Cablevision, Charter, and Cox). At CES® 2015, Sling TV emerged as a potential game changer in the TV services industry by offering small channel bundles exclusively for OTT distribution. Announcements from Comcast, Sony, Verizon, and CenturyLink added further fuel to the "skinny-bundle fire," setting the stage for OTT skinny bundles to emerge as legitimate offerings from multiple providers in 2016. Content providers show some inconsistency in their willingness to be on skinny bundle plans, but consumers established a demand for lower prices and more options. A positive reception by consumers of these new services will play a large part in whether or not more providers begin offering their own custom services.

The average consumer watches ***just under*** **30 hours** of video per week



## The Evolving Theatrical Window

Netflix and Amazon have both announced plans to institute limited theatrical runs for original feature films in conjunction with exclusive streaming on their services. Paramount also announced plans to release a limited slate of films for accelerated theatrical-to-digital runs. While the box office remains a measuring stick for the performance of films, particularly big-budget blockbusters, studios increasingly seek to exploit all means to monetize content. For popular but smaller budget films, it may make sense to recoup a high percentage of the budget at the box office, then monetize through means accessible within the average consumer's home. Theater owners have pushed back on accelerating the theatrical window, but studios may increasingly see value in shortening the window and pushing for home video distribution.

## Streaming as the New Premium

As consumers increasingly turn to streaming platforms for movies and television, content companies and networks alike are seeking ways to increase viewership and monetize video through digital means. An August 2015 deal between Hulu and Epix brought new releases from Lionsgate, MGM, and Paramount to the streaming service. In 2016, Netflix will take up the first television licensing window for new release Disney feature films, a window which Starz previously held. That means all new Disney, Pixar, and Marvel films, which would normally go to a premium movie network, will go first to Netflix. HBO launched its HBO Now service, which caters to consumers without a pay-TV bundle. Through 2016, what constitutes "premium channels" will evolve to include standalone OTT services from content providers and third-party streaming services.

# Digital Health

## Consolidation

Health and wellness apps are key use cases on smartphones and tablets. The strong growth and tremendous potential in the healthcare markets have prompted new rounds of innovations and consolidation. In 2016, consolidation in the payer and provider markets will continue, helping reduce market fragmentation and increase the scale of digital health solution deployment.

## Outcome-based Values

The shift to pay for performance will incent care providers to invest in scalable and effective digital health solutions. The value proposition for digital health solutions will increasingly become outcome-based, and solution providers will be asked to participate more in a risk-sharing contract. This trend will require new strategies to engage the most at-risk (and high-cost) patients. Currently 40-45% of U.S. consumers with chronic conditions have used at least one health app, but the percentage of daily users is still under 5%.

## Pathway for Innovations

As innovators demonstrate their solutions' value to the healthcare industry, the incumbent players will become more active in the digital health market via partnerships and mergers and acquisitions. The digital health entrepreneur market will experience a shakeup in the next 2-3 years. The top innovators will find their IPO path or be acquired, and the struggling entrepreneurs will find access to the capital markets closed.

## Body Area Networks

Sensor technology will experience significant strides forward in the next five years; Body Area Networks (BANs) will become affordable solutions and add significant value to the digital health markets.

## Care Coordination

Low awareness among consumers hampers utilization of wellness benefits. For example, only 6% of health insurance customers are aware that their insurers offer discounts towards the purchase of certain fitness tracking devices. Healthcare companies are under pressure to improve their engagement efforts, especially among customers with chronic conditions. As a result, the care coordination function will become more sophisticated and personalized in 2016, as more health data converge and smart algorithms play a key role in personalized care delivery.

# Energy Management

## Residential Solar Gaining Momentum

The price of solar photovoltaic panels has seen a rapid decline, and aggressive competition (SolarCity, First Solar, many smaller competitors) is driving down the price of inverters and installation. Tax incentives and third-party financing are also making solar more affordable. As the adoption of solar increases, it will drive adoption and usage of devices or apps that allow the user to monitor their system.

## Leveraging Smart Home Products and Services for Demand Response

The market will see a rise of bring-your-own-device programs that take advantage of the installed base of connected products, with co-marketing with manufacturers in order to recruit consumer participation in energy programs. There will also be a shift in demand response programs where they will be connecting via the cloud rather than the smart meter or legacy systems.

## Market-Driven EE and Demand Response Programs

These programs will utilize smart meters for measurement and verification of participation in demand response. Lengthy pilots have hindered the use of new technologies in DR programs, so newly designed programs will use DR bidding and market-based measurement and verification to measure success. Through this, the market will see DR direct participation in energy markets.

**25%** *of U.S. broadband households* **consider** an **energy monitoring service** very appealing



## Data Analytics Driving Value in the Industry

Utilities will broaden their use of data analytics to optimize grid operations, including outage management and volt/VAR control. The use of disaggregation will drive value for energy providers, consumers, and businesses.

## Battery Storage

The unprecedented availability of onsite backup power, EV charging, will make solar useful into the night. Tesla is bringing the PowerWall to market in 2016, and other technologies will compete (EOS aqueous zinc). The expansion of ancillary services in energy markets will enable cost-effective battery storage solutions.

# Mobile Apps

### HTML5 as a Cross-platform Solution

As HTML5 standards take shape and become more widely adopted, HTML5-based app development tools will become more readily available, helping shorten the cross-platform app development time and improve app interoperability across PC, TV, and mobile platforms and among their different operating systems.

### Smarter Advertising

Use of app blockers and stricter protection of consumer privacy will force app developers to come up with new means to support ad-supported business models. Ad inventory on mobile platforms will become less intrusive, more logically embedded within the content, and less disruptive to the user experience. Parks Associates research indicates younger consumers will be receptive to this approach—the willingness to share personal data increases with each younger age group, peaking among heads of household 18-24.

### Voice Control

Apps for other devices, such as connected TVs, connected cars, and wearables, will evolve with new designs, supplemented by voice-control. Voice control will be as important to app experience as today's touchscreen sensors. Currently almost 40% of smartphone owners use some sort of voice recognition software.

### Mobile Payments

Commerce activities will increasingly take place inside mobile apps. In-app payment will gradually be able to process transactions with higher prices, driving the continued consumer retail spending from offline to online and to mobile in particular.

### Impending Battle for App Revenues

Services will be gradually delivered via app as well, resulting in an increasing proportion of subscription revenue from apps. The current model for app stores will be challenged by large subscription service providers, which view the 30% cut charged by app stores as too expensive in an agency pricing model. The fight will be epic like today's battle between pay-TV providers and pay-TV content producers over rights negotiation.

**35%** *of smartphone owners*
**use social networking apps**
**for an hour or more** daily.

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# OTT Video Services

### Uptake of New Direct-to-Consumer OTT Services

Parks Associates' ***OTT Video Market Tracker*** reports that over 25% of OTT video services in the U.S. market today came out in 2015, with 40% of services launched within the last two years. While Netflix will continue to lead the OTT video services market in the U.S., many content producers such as HBO, CBS, NBCUniversal, and Viacom have launched direct-to-consumer subscription OTT video services. More will be doing so in 2016, making this year a critical time for these services. Will these services continue to grow throughout the year, or will they quickly plateau to become one of a jumble of options that consumers could take or leave?

### Entry into the OTT Market by Non-traditional Players

Several non-traditional players in video service subscriptions are beginning to stake their claim in the emerging OTT video services market, a trend that will become more prominent in 2016. Magazine and news publishers have moved major portions of their publications online and to a video-based format. These companies have recognized brands, professional production, strong creative teams, and roots in both subscription models and advertising. All of these factors position them well for OTT services. E-sports, weather services, and others will also jump into OTT in 2016.

### Investments in Original Programming

As more companies add services, content-based differentiation will become more problematic and more critical to success. In 2016, a record number of OTT services will invest record amounts in original programming, a boon for worldwide content production companies.

### OTT Video Service Stacking

Parks Associates consumer research finds 22% of U.S. broadband households subscribe to more than one OTT service and more than 25% use two or more services on a monthly basis. In addition. A common question among players in the market today is regarding the number of concurrent OTT subscriptions that an individual or household will hold. Today, Netflix dominates subscriptions, with consumers churning through other services throughout the year. In 2016, service stacking habits will become increasingly clear as OTT video services mature and a select group of leaders begin to set themselves apart.

### The Success of Ad-based OTT Services

Though subscription OTT services like Netflix are popular, particularly in the U.S., advertising holds the key to more significant revenues. After all, it is difficult to make billions in revenue off of $7.99 per user per month. In the U.S., Verizon is pushing the envelope for ad-based services with its Go90 mobile video offering. If Go90 and other services with ad models are successful in 2016, it has the potential to shift both ad money and consumer viewing to new players and new types of offerings.

**22%** of U.S. broadband households

**SUBSCRIBE** to
***more than one***
**OTT service**

# Smart Home Devices and Services

## Entry of Large Outside Players

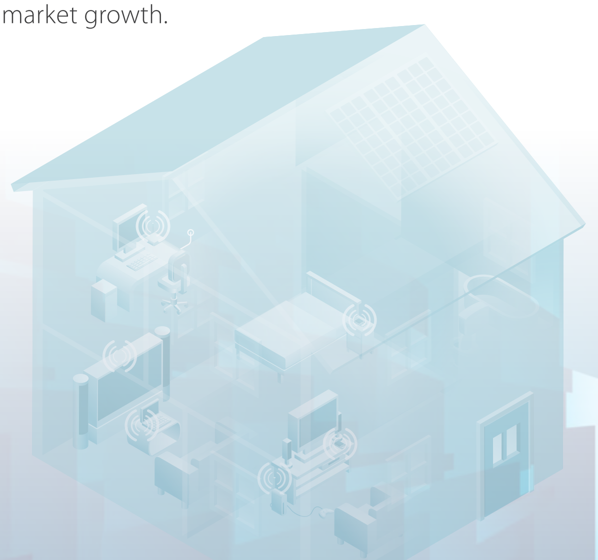
Ownership of smart home products increased substantially in the last year. This growth in consumer interest is attracting big players into the smart home, and Apple, Amazon, and Facebook are all entering this market. Given the market leadership position in their core businesses, entry of the behemoths must be taken seriously.

## Standards and Protocols

An increasing number of protocols and application standards are vying for position. ZigBee and Z-Wave must defend their smart home leadership against new entrants including 802.11ah, Bluetooth IP, DECT IP, and Thread networking standards as well as application standards from the Open Interconnect Consortium and the AllSeen Alliance.

## Nontraditional Players in Security

U.S. cable and telecom operators are starting to find success in the security business. The addition of home controls and interactive services is expanding the professionally monitored security market, and the security channel is the leading channel for smart home services. By the end of 2015, nearly six million professionally monitored homes will also have smart home control as part of their security system. While all channels are experiencing growth, Comcast, AT&T, and Time Warner Cable are all taking a large share of the market growth.



OVER **40%** of U.S. broadband households plan to purchase a **smart home** device in the next ***12 months***

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## Europe Providers jump into the Smart Home

European telecoms have been watching the U.S. market. Bolstered by the success of U.S. telecoms, numerous European telecoms including Orange, British Telecom, and Deutsche Telekom have entered the connected home market, with security as a key offering. Parks Associates research finds 11% of U.K. broadband households own a home control system, compared to 10% in France and Spain and 8% in Germany. Approximately 9% of broadband households in the U.K., Germany, Spain, and France own a smart home device.

## More Connected Products in the IoT

Nearly one-third of U.S. broadband households planned to purchase a smart lightbulb by end of 2015, while 17% intend to buy a smart kitchen appliance and 14% plan to purchase a smart thermostat. Lights, locks, thermostats, and network cameras continue to be the most popular categories of smart products, but the breadth of connected devices continues to expand as multiple manufacturers are launching numerous models of connected appliances, sprinkler systems, and ceiling fans. The smart kitchen will start to take shape as a mass-market concept in 2016.

# Tech Support

Nearly **Two-thirds** of U.S. consumers have some sort of **security and privacy** support service *for their connected devices.*



## Privacy/Security-focused Support Services

Security and privacy support will become more central to support subscriptions to satisfy both consumer and business needs. The rate of adoption for traditional support services has been relatively flat, so amid growing concerns for security and privacy among connected consumers, a greater emphasis on security and privacy will increase interest, adoption, and usage of support services.

## New Targets for Support Subscriptions

The demographic profiles of technical support subscribers are changing. Consumers 65 years and older have the highest percentage of those who have a technical support subscription, with 22% subscribing to a support service. As online activity and the use of connected devices among consumers in these older age groups increase, support providers will shift their focus to promote services that have strong appeal among this group. This shift in strategy will be especially important as support subscription adoption is declining among younger age groups.

## Expanding Device Coverage

Premium support providers are expanding device coverage to include smart home and other emerging connected devices. Support services for these devices will initially focus on purchase consultation services—for which there is currently a void in the market—as well as enablement services that help consumers to set up and use device features effectively. Premium support services for emerging devices will target consumers who purchase DIY products.

## Use of Big Data to Improve Support

Connected devices enable extensive visibility into device and network activities. As competition increases among consumer technology brands, many of these brands will look to include or offer support as a competitive differentiator for their product. They will also leverage the data generated by these connected devices to improve the efficiency and effectiveness of their support services. This tactic can be useful in attracting younger age groups, especially as U.S. broadband households with young heads of households (ages 18-24) are the most willing to share data in exchange for incentives or a better connected experience.

## Higher Use of Engagement Strategies

Strategies employed by premium support providers to keep subscribers engaged with their support services have been successful—more subscribers are using their support services and keeping their service longer. Providers will continue to use various methods to keep consumers engaged, including making regular contact with consumers and performing regular device-checks. Support services will eventually be more akin to support memberships.

# Video Technologies

## 4K / UltraHD Video Content

**56%** of flat-panel TV shoppers consider smart capabilities ***to be important,*** **versus**
**39%** who value 4K picture quality.

© Parks Associates

4K adoption has been slower than hoped, with content availability as a key inhibitor. When is 4K coming? When will 4K TVs be mass market, and when will the content arrive? These have been key questions for the past two years. 2016 will be an important year for 4K / UltraHD in the global marketplace. Many will look to the 2015 and 2016 holiday seasons and the 2016 Olympics as major events to drive new TV purchases. New disc formats (and now new disc players) will allow 4K physical media to reach consumers. However, 4K content will be the big factor. If December 2016 arrives without a notable increase in content, it would indicate that 4K will be a long-term play rather than a short-term hit.

## Video Delivery Platforms and Services

Competition in video delivery is more intense than ever. AWS, Microsoft, and other big players are adding video delivery capabilities, pushing some services ever more to commoditization. Differentiation among players remains a challenge, with many OVPs, solution vendors, and video PaaS providers seeming to offer slightly different variations of the same thing. 2016 will prove pivotal for these players. The influx of new services could keep several marginal players kicking. However, the significant number of players will keep competition high. Will this be a year of plenty or a year of consolidation? We will find out over the next 12 months.

## Video Apps

Watch for mobile to play an increased role in video discovery, interactivity, social/community connections, piracy, and consumption in 2016. New services like Verizon's Go90 and Viacom's Noggin are designed specifically for mobile platforms and will either succeed or fail over the course of the year. Periscope, Meerkat, and other personal streaming apps will be the talk of 2016. TV networks, broadcasters, and other players will be looking to take mobile to the next level in order to engage consumers. Be looking for new integrated functionality and for consumers to pick favorites and abandon pretenders.

## Cloud DVR and Virtualized Features

An increasing number of global operators and OTT video services are adding cloud DVR/PVR features to their service offerings, and the trend will continue in 2016. Cloud DVR bridges the gap between live and on-demand for consumers, and content companies are beginning to take notice of the benefits that cloud DVR offers over device-based DVR systems. Cloud DVR and other virtualized video features will gain a greater foothold across video markets throughout the year.

## Virtual Reality Content

From a consumer uptake perspective, virtual reality is still a long way from prime time. Content is limited, and users have to wear heavy glasses or helmets to get the experience. (Do we all remember what happened to 3D TV?) However, from a development and investment perspective, there are few hotter technologies than VR. Comcast, Google, Instagram, Samsung, Sky, Netflix, and others have either invested notable sums or are talking up VR as the next big thing. Many others will jump on the bandwagon in 2016.