Smart Home Ecosystem: IoT and Consumers

PARKS ASSOCIATES

CEA
Consumer Electronics Association

Parks Associates and CEA have partnered to provide comprehensive research and analysis of the emerging smart home industry. For this effort, in 2Q 2014, Parks Associates completed an online survey of 10,000 U.S. broadband heads of household to assess ownership of, knowledge about, and attitudes towards many types of smart home products that offer new benefits resulting from IoT capabilities. The respondents are representative of all U.S. broadband households with results having a ±.098% margin of error.

This paper provides a broad overview of findings. Parks Associates and CEA also offer a comprehensive report with detailed findings for this study. For more information on the detailed report, please email sales@parksassociates.com or research@ce.org.

Understanding the transformation from connected to smart home products

A new type of home management, safety, and surveillance devices is emerging.

Dubbed smart home devices and systems, this new type incorporates the capabilities inherent in IoT and provides enhanced benefits for one or more categories pertinent to managing the home.

What began as a trickle of products, has morphed to a steady stream of smart home device and system introductions. Starting with networked security taking advantage of broadband capability for surveillance of one sort or another to, more recently, smart thermostats coming from start-ups as savvy as Nest, and smart garage door openers from stalwarts such as Chamberlain, products are smart and connected.

Over the next 2-4 years, all home management products offering benefits that accrue to consumers, distribution, service providers, or manufacturers will offer smart home devices. These new devices, however, represent the beginning, not the end, of a transformation in the management of systems and devices in the home.

What is the Internet of Things?

The term Internet of Things (IoT) has several interpretations, but for the purpose of this research, IoT is defined as devices that connect to the Internet and have accompanying virtual objects in the cloud. Synchronized with the real-world objects, the virtual object represents the current state of the end device.

The virtual object also retains historical information on the device's operation, such as total operating time, total power-up cycles, last time it was on, and so forth.

Devices may be static objects that simply report their properties, sensors that measure the physical conditions or status, actuators that perform operations, or any combination of these.

Consumers are able to manipulate this virtual object through an interface such as a smartphone, tablet, or computer that remotely operates the device in the home. The device may also be queried or controlled by other platforms, controllers, or applications that coordinate multiple objects. In addition, the data from smart devices can be integrated with external data to create value-added services.

The potential breadth of applications is nearly unlimited with available applications increasing routinely.

Smart home devices and systems require that homes are connected—*have broadband capability*—and contain a home network of some type.

With these in place, smart home devices and controllers can communicate to each other and with the cloud to gain information or control products based on a consumer's preferences or commands. They can also use information external to their specific device to enhance the operation of that device to the consumer's benefit.

Finally, they use their capabilities to communicate with each other based on their individual status. In that way, homes will evolve to become their own ecosystems.

Smart Home Devices & Systems

Smart home devices have processing intelligence and connectedness to the Internet through a home network for the purpose of remote access, monitoring, and control capabilities.

Intelligence for systems and devices may be contained completely within the product, combined with platform intelligence in the cloud, or reside almost completely within a platform to which the product connects to perform functions.

Prior generations of home management products/systems have provided some or great programmability but have had functional control capabilities contained within the device/system itself. Examples include programmable thermostats and high-end/advanced central controllers.

Why do manufacturers and service providers want to be part of the smart home ecosystem?

Driving the industries planning to or introducing smart home products, systems, and services are competitive forces as well as the simpler, but compelling, concept, "**It can now be done.**"

These product transformations provide industry players a chance to reposition as leaders in this new market. Also propelling the transformation is the promise of innovative business models that allow a manufacturer to gain more recurring revenue, market aftermarket supplies or products, maintain their mindshare, or offer consumers a different path to purchase. Consumers may gain discounts from sources as disparate as insurers and product suppliers. The manufacturers can use gained product data to help consumers in new ways.

CREATING HIGHER VALUE FROM A ONE-SHOT PURCHASE IS A HOLY GRAIL.

Using updates to continuously improve products, remind consumers of supplies or maintenance issues, and connect to other products among other use cases is an enticing concept to manufacturers ever in search of higher margins and customer loyalty. Manufacturers may use one or more of the business models noted in Figure 1; other models will emerge that are not even imagined today as the market tests and refines models.

Most of today's smart home products are at the lower edge of envisioned capabilities, capable of storing data, responding to user commands from smartphones, tablets and computers, and sending alerts. A few products like Nest's smart thermostat have entered Level II, if only at its lower edge. More intelligence, more modeling, and more weaving of information that can help a product execute ever-better decisions on a consumer's behalf are coming.

Disruptions take time to occur…but once established, there is a rush excel and improve.

Disruption requires innovative products blended with innovations in business models. The industry is watching the edge of the movement forward. The companies that mesh product advancement with valuable business models will have strong positions for a long time (Figure 2).

Innovations in Business Models
Recurring Fees that Replace Some Upfront Product Pricing
Transaction Fee as Distribution Channel
New Premium Product Sales
Differentiation in Portfolio Bundles (Higher Margin Mix)
Complementary Product Sales (Accessories, Services)
Sales Channel Expansion
App Sales for Upgrade Revenues
Mobile Advertising Revenue
Sales of Smart Data
Platform Connection or Transaction Fee
Increased Loyalty as Trusted Home Advisor, Churn & Customer Acquisition Cost Reductions
Subscription Revenue Cuts—Energy Management (EE & DR)

Figure 1

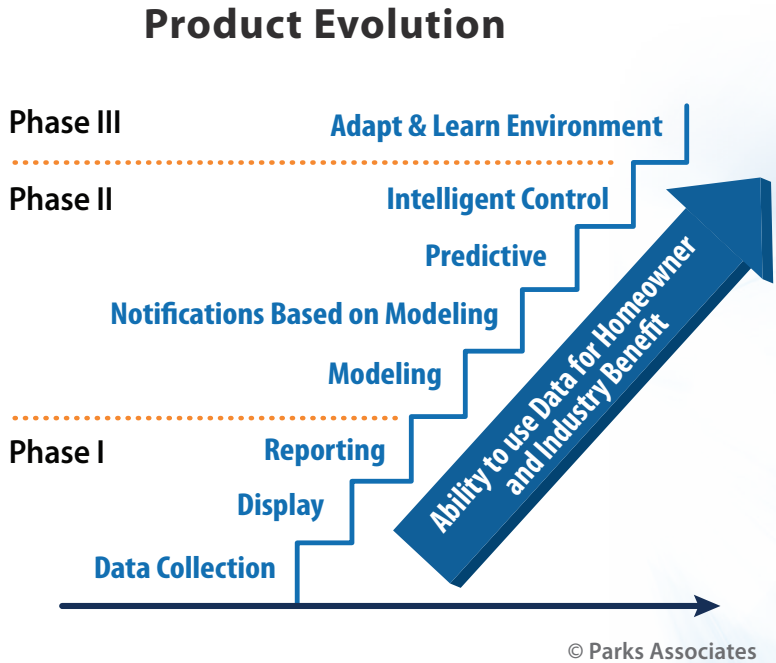
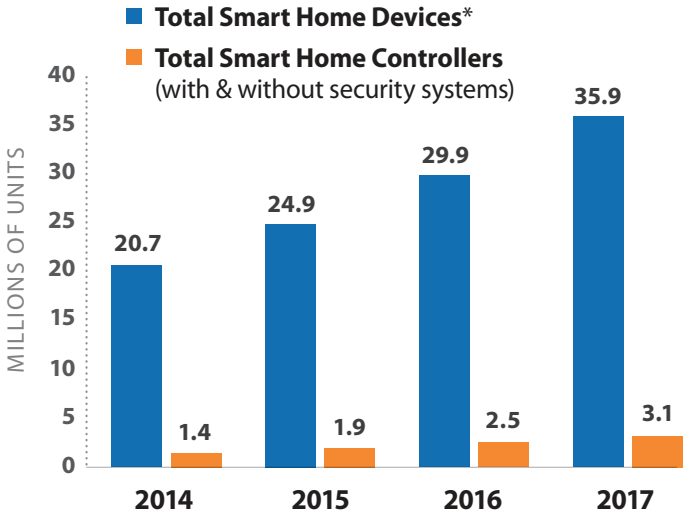


Figure 2

Unit sales, overall, offer high growth rates, well beyond the years forecast in Figure 3. The volume represented is not for all devices that may be connected but rather for common home management devices. No installation numbers or corollary services are represented.

U.S. Unit Sales of Smart Home Controllers & Selected Smart Home Devices



* Units of smart home devices include smart thermostats, networked cameras, smart door locks, smart water leak detectors, smart smoke detectors, smart carbon monoxide detectors, and smart light bulbs, smart light switches, smart plugs and outlets, and smart power strips

Figure 3

Current Consumer Market for Smart Home Devices

Since broadband capability must be available for smart home devices to function as part of the IoT, the first stat to understand is the percentage of U.S. homes having that capability.

At the end of 2014, 79% of U.S. households will have broadband access. About 80% of those households have an operating home network.

Therefore, smart home device ownership rates are lower for all U.S. households than they are for U.S. broadband households and a bit higher than shown in Figure 4 when measured against homes having broadband *and* a home network.

Regardless of which denominator is used, smart home devices and systems are in early adoption. Thirteen percent of broadband households report ownership of at least one smart home device from the list of devices under survey (see side bar).[1]

Products Under Survey
Connected Smart Devices for Doors and Garage Doors
Door Locks
Motorized Garage Door Openers
Door Bells/Door Chimes and Intercoms
Connected Smart Sensors
Smoke Detectors
Carbon Monoxide Detectors
Water Leak/Humidity Detectors
Combination Smoke & Carbon Monoxide Sensor
Connected Smart Lighting/Power Devices
Lights
Wall Outlet/Smart Plug
Power Strip
Other Connected Smart Devices
Programmable Thermostat
Sprinkler System
Blinds or Drapes
Home or Kitchen Appliances
Networked Security or Monitoring Cameras

[1] Not all networked security cameras are included in this count. Total adoption of networked security cameras by U.S. broadband households is at 15%-17% as of 2Q 2014.

IN TOTAL — **10% of all U.S. households have at least one smart home device.**

NO SINGLE SMART HOME device under survey earned over 6% ownership.

TWO-THIRDS OF SMART HOME device owners report that their devices are attached to a centralized controller of some type.

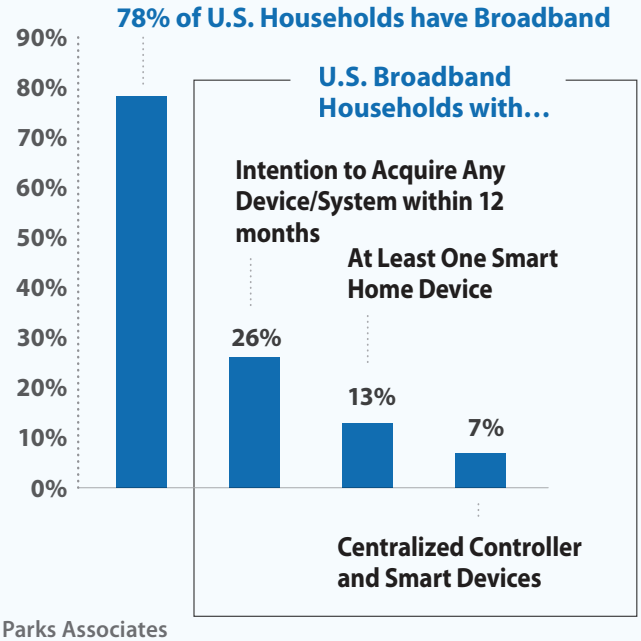
THE BULK OF THE OWNERS that report having their devices attached to a centralized controller, 7% of broadband households, have acquired smart home devices with their security systems.

A LOW PERCENTAGE have a hard-wired, high-end central controller such as offered by Control4, Savant, and Crestron.

THE REMAINDER of those reporting the presence of a centralized controller acquired it without a security system connection.

FINALLY, the remainder of the 13% who report any device ownership acquired the device as a stand-alone product, independent of any centralized controller (Figure 4).

Households with a Smart Device/System



© Parks Associates

Figure 4

Understanding the Smart Home Market

Several characteristics describe the consumer and his or her relationship to smart home products and services today. Some are predictable early adopter factors; others offer a bit of a paradox.

LOW FAMILIARITY

The most important identifiable inhibitor is *low awareness* among consumers that smart home product and systems exist.

Consumers cannot assess products and services of which they are unaware.

What familiarity does exist reflects activities of two sectors—

1. Security providers with smart home adjacencies;
2. Nest, with its 'cool' designs and Apple-like panache.

To accelerate adoption of smart home devices and systems requires more consumer understanding. Given the newness of the benefits, and consumers' lack of understanding, educational outreach needs to come from manufacturers and retailers of all sizes as well as from big player activity. Familiarity will increase naturally over time, but accelerating the rate of familiarity diffusion will directly affect short-term unit device, systems, and services sales across categories. The higher the familiarity, the more likely consumer assessment of benefits can occur, and the faster product improvements and additions can also (Figure 5).

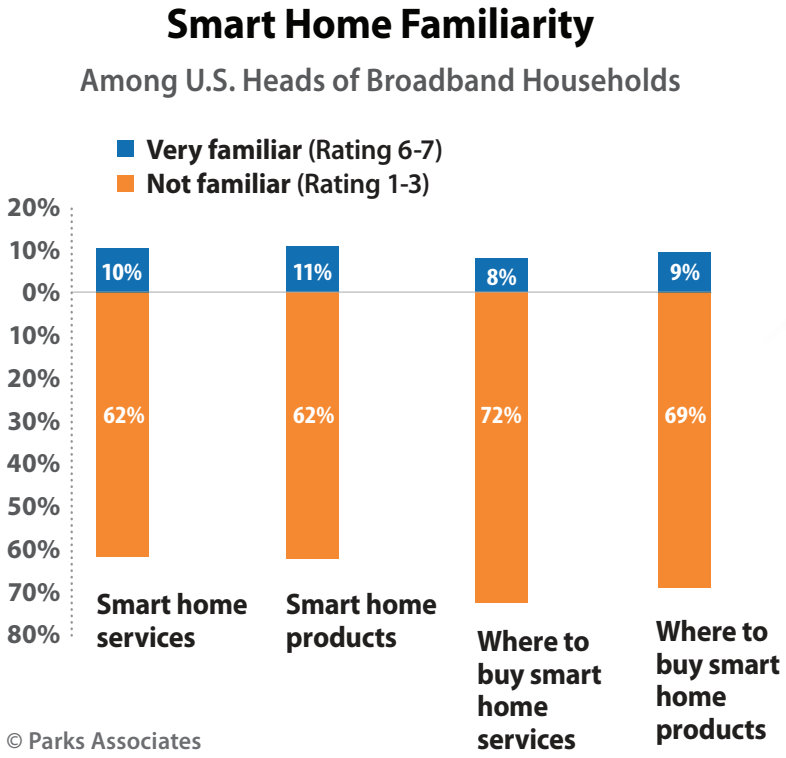


Figure 5

LOW AWARENESS OF PURCHASE PROCESS AND SALES CHANNELS

Unsurprisingly, familiarity with purchase process considerations such as knowing how and where to purchase smart home products is even lower than for the products and services themselves.

This finding is a natural consequence among products lacking consumer familiarity and will not change until familiarity increases. Addressing this market characteristic is important because it means that most consumers will only come across smart home products 'by chance.' That may occur when a householder finds some management product 'broken' and searches for a replacement.

Most people shop in stores with a sense of purpose, particularly for utilitarian items. This means stores and providers must showcase their smart home products and services in every way they can. It also translates to a current competitor advantage for security providers who meet with potential customers in person and can demonstrate the benefits of smart home devices.

> Moving householders to want to upgrade, to replace a working product, or to seek a benefit they have lived without requires strong, clear marketing of benefits.

LOW BRAND AWARENESS

Respondents were asked to cite three brands for smart home service providers and three for product manufacturers. ADT and AT&T had the highest rates of unaided awareness as "smart home service providers"—both companies were named, unaided, by 16% of respondents.

Consumers struggle even more when asked to name product manufacturers, unaided.

ADT and AT&T were again the leading companies named when consumers were asked to identify, unaided, smart home manufacturers but now with only 6-7% of respondents naming them. The first actual manufacturer to be named is Apple at 5%. Nest was written in by 3%. Manufacturers in this area haven't yet made a significant mark with their products/brands. While this presents a challenge in selling new products, it provides an opportunity for skillful companies to establish new market share and secure early brand awareness and recognition.

A BROAD SET OF ACQUISITION METHODS

Among current owners of smart home devices, methods of buying new products are diverse. There is a low rate for retail purchase and a relatively high rate for acquisition from security or broadband providers. The lack of dominance of any particular channel is also evident.

THE MARKET FOR SMART HOME PRODUCTS IS WIDE OPEN TO COMPETITION FROM MULTIPLE CHANNELS.

If retailers can host a compelling demonstration of smart home device systems and benefits, placing it for obvious attention, with interesting interactive guides, they have a good chance of increasing their take of the sales (Figure 6).

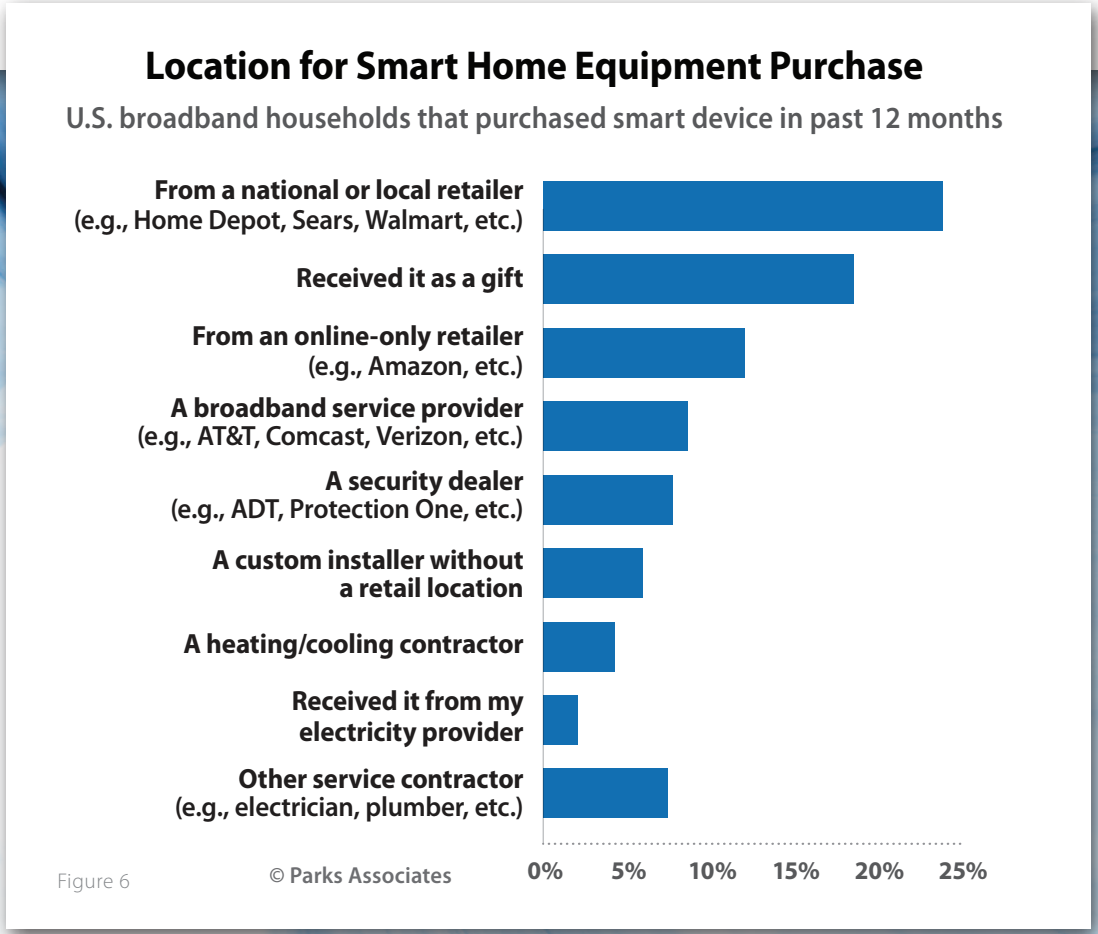


Figure 6

PURPOSEFUL PURCHASES

Over 60% of current smart device or system owners spent more than a day shopping for their purchased smart home systems or devices.

That process includes comparisons and research. Only 13% of buyers purchased nearly spontaneously.

Starting now—and for the coming 18 months or so—**companies need to prepare to answer questions** about their smart device and system offerings.

Retailers need to train salespeople or make one or two people on the store floor 'experts.' Online sites need to offer chat with live and knowledgeable personnel. Providing bad or incomplete information will stop a sale (Figure 7).

Retail stores should add point of purchase displays, demonstration stations, and perhaps even educational events. If online, retailers need to provide crisp videos showcasing benefits, ease-of-installation, and ease-of-use.

Time Spent Shopping for Smart Home Devices

U.S. broadband households that purchased smart device in past 12 months

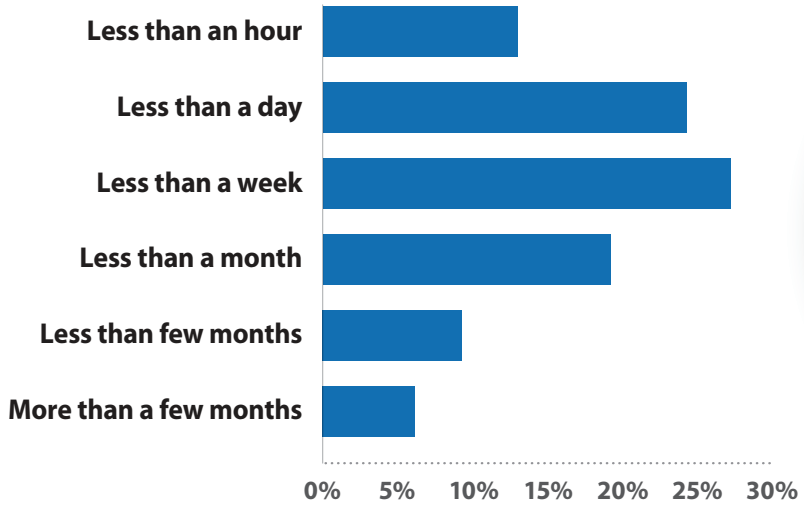


Figure 7

INTEROPERABILITY BETWEEN DEVICES, EVEN FROM DIFFERENT MANUFACTURERS, MATTERS

Overall, householders report a preference for systems over stand-alone products.

Even for non-owners of smart home devices, 50% report interoperability as "very important."

As the number of devices that a household owns increases, so does the importance of interoperability, with 60% of owners with three devices or more finding it "very important."

With that said, the rate of interoperability importance varies by device. For example, only 28% of first-time smart garage door openers declare interoperability to be "very important," compared to 67% of door lock buyers. The two products for which interoperability is less important for first device and even second device purchasers are smart garage door openers and programmable thermostats. They are also the two devices most likely to be purchased "stand-alone."

Importantly, the more devices a household owns, the more interoperability matters as a purchase process consideration.

Going forward, providing interoperability that encourages the purchase of additional devices is a critical component of success. Lacking interoperability is a competitive disadvantage. Only the most powerful manufacturers or providers will be able to succeed with closed systems or walled gardens; over time, they too will need to provide a way for diverse product sets to attach to their controllers or devices.

DRIVING REPEAT BUYERS

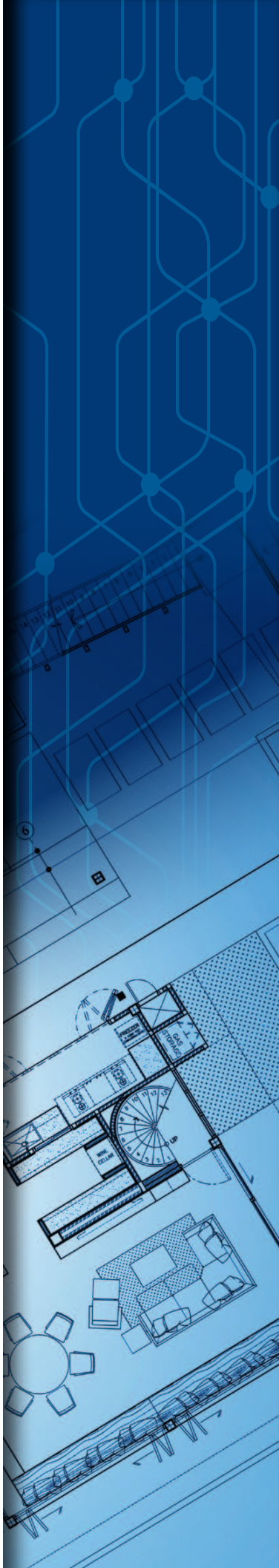
30-40% of all smart home device and system purchases occurred in the 12 months prior to the Q2 2014 survey.

This finding reflects the newness of the marketplace. In addition, 30-40% of purchases in the past year were upgrades and replacements, with 30-50% of purchases being first-timers for smart home devices and systems.

Once a household has one smart device, there is, on average, a **1-in-2 chance** that same household will **acquire another device within a year**.

That reality points to the high importance of two different messaging opportunities:

1. Messages and options encouraging first-time purchases
2. Enticing current owners with opportunities to expand their benefits and features by adding on additional products to the first-time purchase



Who are today's smart device and system owners?

HIGH TECH AFFINITY

Unsurprisingly, early adopters of smart home devices and products are often householders with high tech affinity.

They like technology in general and are ***four times more likely*** than the population at large **to purchase technology products as soon as they are available** (Figure 8). Smart device owners are also 50% more likely than the nation at large to report that they buy technology "soon after it is available."

In keeping with that theme of tech affinity, the study discovered that ***smart home device owners*** are **twice as likely to own one or more** of a set of high-tech products under survey than non-owners (32%).[2]

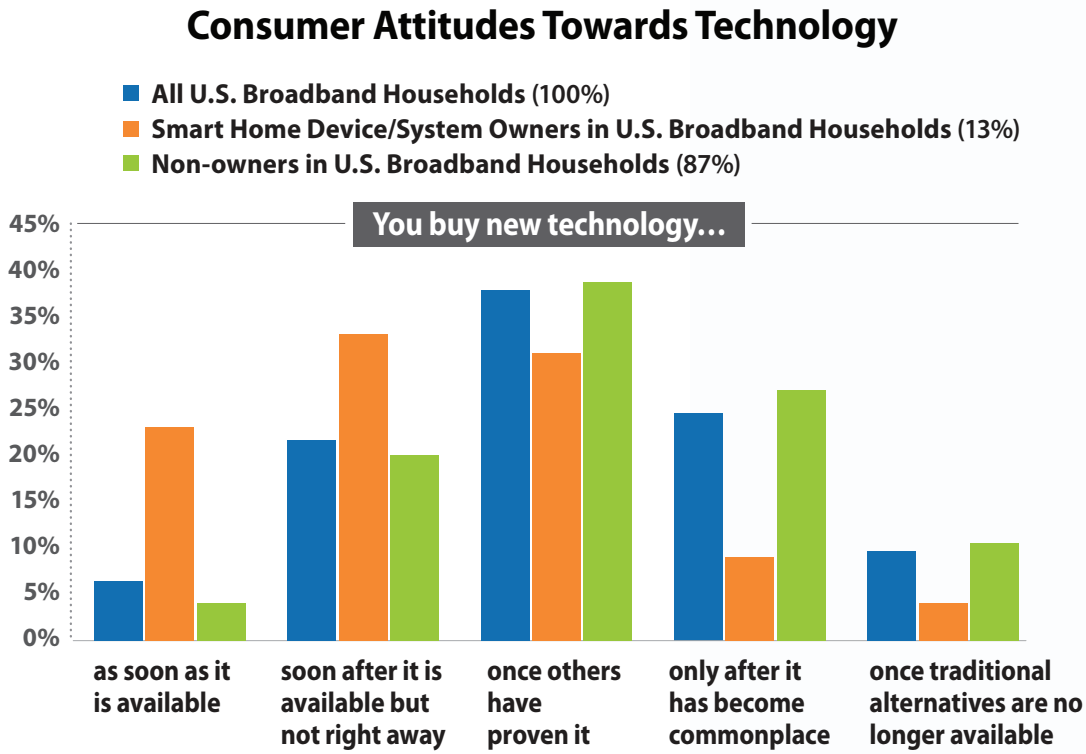


Figure 8

Tech affinity is not the only characteristic that separates early smart home device and system adopters from non-adopters, but it has the highest differential. Next, and in a batch, come **pride of home ownership** and **concern for the safety** of the home and family members.

As early adoption gives way to early majority, these important, but secondary-to-tech, factors will increase in importance.

[2] Parks Associates' set of high-tech products includes steaming media players, smart watches, and connected streaming music systems.

A paradox for early adopter profiles

Current smart device owners also tend to be well-educated, with incomes well above the national average. They are somewhat younger than non-owners, but not as much younger as is often true for early adopters of pure tech products. The reason: these products are for the home and its family, not the person.

HOME OWNERSHIP TRUMPS OTHER FACTORS, INCLUDING AGE.

Certainly some homeowners also enjoy new technologies, particularly in the 25-44 household age groups. But for many, even though an appreciation of technology products is present, the tech isn't why they purchased the smart device or system. They purchased for safety, security, convenience, and other reasons.

In addition, the most significant early smart home system offerings are from security providers offering professionally monitored security. Security systems sell, typically, to an older audience than pure techie products.

All family members may use the smart home system. Importantly, they may not all be comfortable with technology products unless they are easy to use.

Who are the target consumers for future smart home purchases?

Smart home device and system intenders[3] bear many of the same characteristics as today's owner but in less extreme ways.

For example, **intenders report higher tech affinity than the nation at large**, but the differential is less marked than the difference between today's smart home device or system owners and non-adopters. The same holds for characteristics such as income, home ownership, and family configuration.

The importance of high-value benefits other than innovative technology increases for smart device intenders over those reported by smart home device owners. As the marketplace expands, this will become an increasingly important pattern.

[3] Parks Associates uses a 7-pt Likert scale to measure intentions to acquire. Intenders rate their intentions for a 12 month period at 5 or more; High intenders rate their intentions as 6 or 7.

Which smart home devices do intenders report they want to purchase…and how?

Intentions are highest for smart lights and smart thermostats, continuing the present patterns of purchase. Not all intenders will purchase, of course. Purchases are likely to be 3-5% of broadband households for top intention products. Marketing and offers may cause some modification of intentions during the time frame surveyed.

Inertia also occurs if there are inadequate offerings or marketing for even top product categories.

Overall, nearly two-thirds of intenders report that they seek to purchase a smart device that is or can be part of a larger system so that they can expand as desired (Figure 9).

We asked intenders to provide the benefits they seek in an unaided way, simply by writing in words that describe what they seek. While responses are highly varied, several clusters appear.

The one word that appears most often is '**easy**.' Following that are '**control**,' '**safety**,' and '**convenient**.'

These words are marching orders to the service and product providers marketing their smart devices and systems.

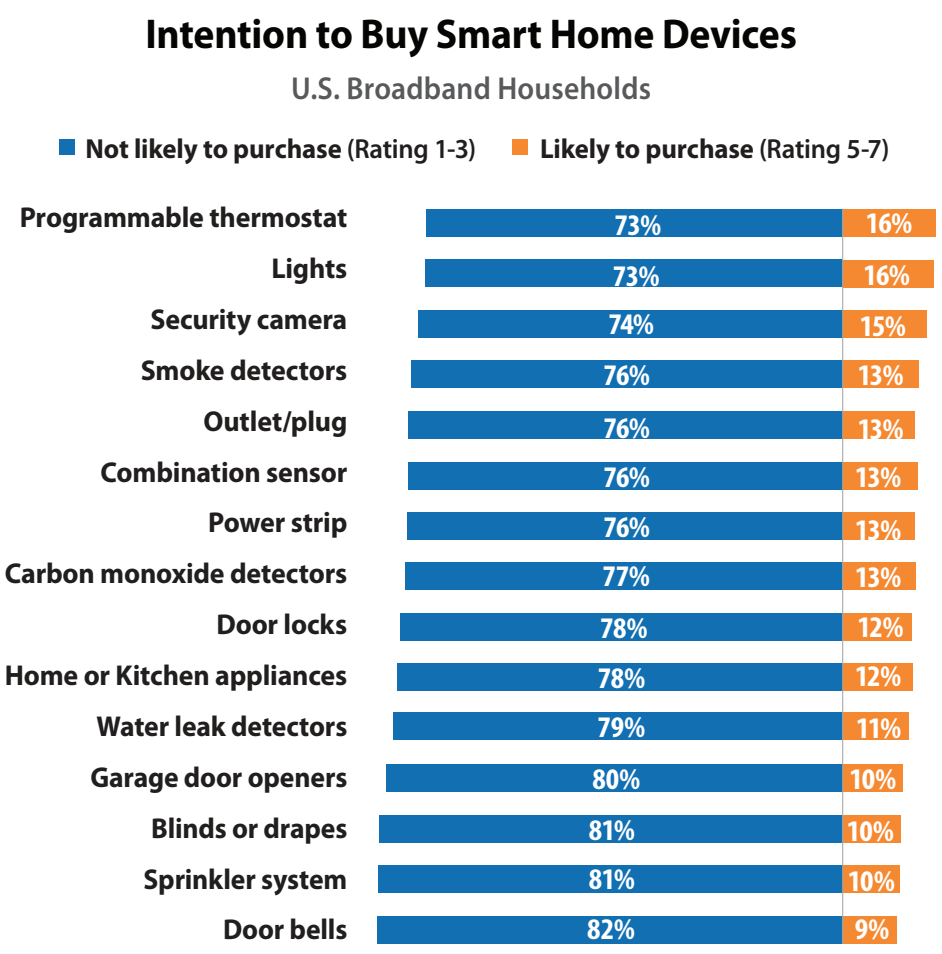


Figure 9

The Bottom Line : The Market Opportunity for the Smart Home is Immense

The smart device, system, and services marketplace is new, young, exciting, and expansive. It is in an early life stage both in terms of buyer profiles and product and system capabilities.

The brands with highest traction are those of service providers offering complete systems, often attached to the acquisition of a professionally monitored security system.

Consumers, even when unfamiliar with the term 'smart home' for specific products and systems, **understand the value of a system**; they prefer systems, even on a conceptual basis, over stand-alone products that will not interoperate as more smart devices become available.

Industry players must keep the word '**easy**' top of mind throughout product design.

For continuing product introduction success, product developers and managers need 'interoperability' to be a characteristic that is cemented next to 'easy.'

The power of available technology helps drive purchases for early buyers yesterday and today, but that characteristic will recede in the future. Control, convenience, and greater safety/security around the home will dominate for some time after that. Finally, consumers appreciate the idea of products working together or using each other for even better benefits.

The entire CE industry, including entertainment products such as speakers and displays, will be incorporated into smart home systems over time.

Over time, so will connected health devices, a now even younger consumer marketplace than smart home. Smartphones, tablets, and computers are already in the ecosystem for the purposes of controls, programming, and alerts.

Now is the time for the industry to deliver on a promise of better, easier-to-use products, systems, and services that help consumers manage their homes and security.

About CEA

The Consumer Electronics Association (CEA) is the preeminent trade association promoting growth in the $211 billion U.S. consumer electronics industry. More than 2,000 companies enjoy the benefits of CEA membership, including legislative advocacy, market research, technical training and education, industry promotion, standards development and the fostering of business and strategic relationships. CEA also owns and produces the International CES®—The Global Stage for Innovation. All profits from CES are reinvested into CEA's industry services. Find CEA online at **www.CE.org**.

About Parks Associates

Parks Associates is an internationally recognized market research and consulting company specializing in emerging consumer technology products and services. Founded in 1986, Parks Associates creates research capital for companies ranging from Fortune 500 to small start-ups through market reports, primary studies, consumer research, custom research, workshops, executive conferences, and annual service subscriptions.

The company's expertise includes the Internet of Things (IoT), digital media and platforms, entertainment and gaming, home networks, Internet and television services, digital health, mobile applications and services, support services, consumer apps, advanced advertising, consumer electronics, energy management, and home control systems and security.

For more information, visit **www.parksassociates.com** or contact **972.490.1113** or **info@parksassociates.com**.