CABA™ Continental Automated Buildings Association

Home Automation Distribution Trends

An analysis for 2017

A CABA WHITE PAPER

Katherina Sutter
MarkIntel

CABA Connected Home Council

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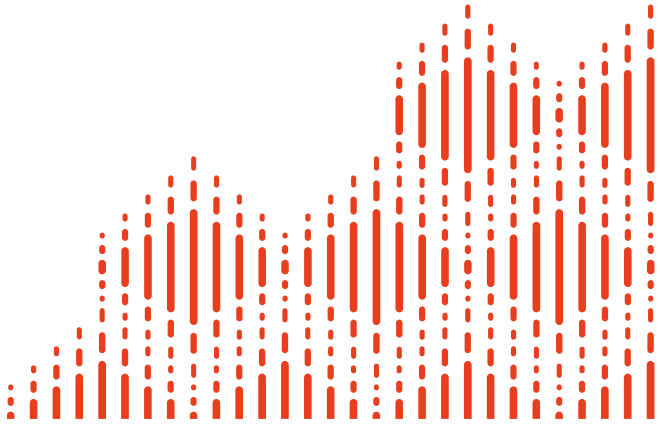

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Published: December 2017

ABOUT CABA

The Continental Automated Buildings Association (CABA) is an international not-for-profit industry association, founded in 1988, and dedicated to the advancement of intelligent home and intelligent building technologies. The organization is supported by an international membership of over 365+ organizations involved in the design, manufacture, installation and retailing of products relating to "Internet of Things, M2M, home automation and intelligent buildings". Public organizations, including utilities and government are also members. CABA's mandate includes providing its members with networking and market research opportunities. CABA also encourages the development of industry standards and protocols, and leads cross-industry initiatives. CABA's collaborative research scope evolved and expanded into the CABA Research Program, which is directed by the CABA Board of Directors. The CABA Research Program's scope includes white papers and multi-client market research in both the Intelligent Buildings and Connected Home sectors. www.caba.org

ABOUT CABA'S CONNECTED HOME COUNCIL (CHC)

Established in 2004, the CABA Connected Home Council initiates and reviews projects that relate to connected home and multiple dwelling unit technologies and applications. Connected homes intelligently access wide area network services such as television and radio programming, data and voice communications, life safety and energy management/control information and distribute them throughout the home for convenient use by consumers. The Council also examines industry opportunities that can accelerate the adoption of new technologies, consumer electronics and broadband services within the burgeoning connected home market. www.CABA.org/CHC

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Published: December 2017

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PUBLISHED
December 2017

Published: December 2017

TABLE OF CONTENTS

Published: December 2017

1. INTRODUCTION

This report analyzes the change in distribution channels for home appliances with the evolving Internet of Things (IoT). As homes become smart and a new generation gains purchasing power, and as new suppliers with different distribution channel access enter the market, end-users will change the way they shop to equip their home.

To be specific, while distribution of building services devices traditionally through the "professional channel", vis-à-vis installers or other service providers, the adoption of wireless connectivity and Internet connection changed the marketplace. End-users can now install systems by themselves. As a consequence, a number of start-ups were founded to manufacture and sell DIY equipment. These new manufacturers did not have an established network of distributors and contractors to sell their product and decided to sell directly to the end-user, circumventing the intermediary, by offering their products through big box and online retailers. However, the increase in diversity of distribution channels did not end there; other alternative channels also emerged and channel selection keeps evolving.

Who knew five years ago that wholesalers could or should be interested in carrying DIY brands? Or that online retailers would hire system integrators as employees? Who would have anticipated the success of bring your own thermostat (BYOT) demand response programs? Such changes can reveal new opportunities and threats. Consequently, staying informed is relevant to the success many industries.

To analyze the emergence of alternative distribution channels and current distribution trends, the author looked into the last 10 years' of development of the supplier base, user base and purchasing behavior for HVAC systems/thermostats, security systems, AV systems and lighting, which are the core components of modern home automation systems.

2. TRADITIONAL DISTRIBUTION CHANNELS

Household electronic equipment and electromechanical building services equipment such as HVAC and lighting has been around for 100 years.[1] Burglar alarms were invented in the middle of the 19th century[2], and video monitoring for home security became commercially available in the middle of the 20th century.[3]

Traditionally, these types of electromechanical equipment were installed by professional contractors, who typically purchased them from distributors, who obtained them from the manufacturer.

[1] http://www.popularmechanics.com/home/how-to/a7951/a-brief-history-of-air-conditioning-10720229/
https://en.wikipedia.org/wiki/Electric_light
[2] https://archive.org/stream/domesticsecurity00donn/domesticsecurity00donn_djvu.txt
[3] http://www.freepatentsonline.com/3482037.html

Published: December 2017

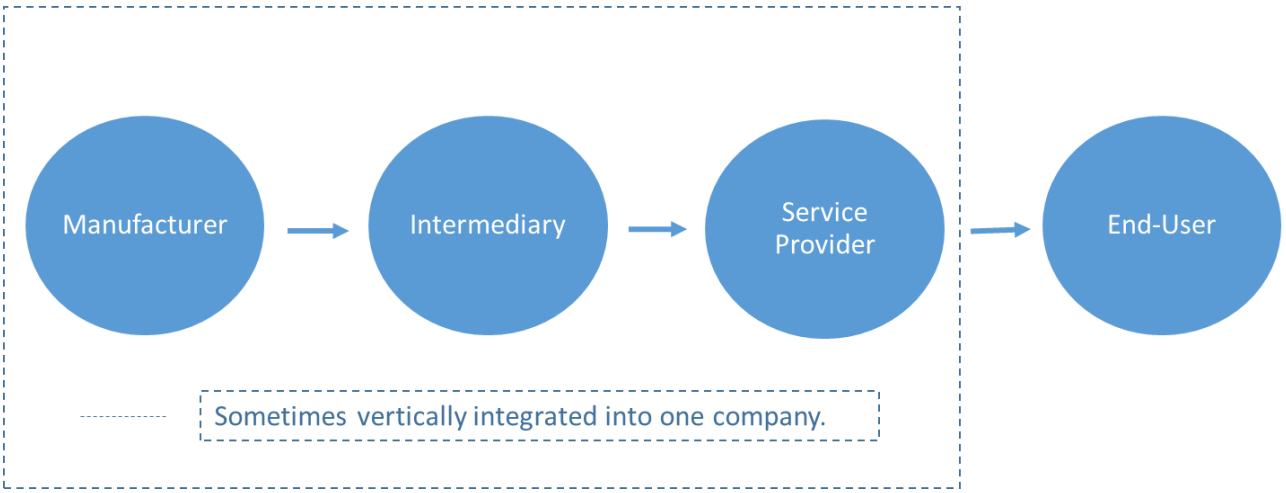


Figure 1 Traditional distribution channel for HVAC, lighting and security systems

While residential HVAC equipment- and controls/thermostat manufacturers typically sell their goods to wholesalers who resell them to professional installers, home security companies operate an integrated manufacturing business, monitoring service and installation business and deal directly with the end-user.

Professional installers and service providers such as HVAC technicians, electricians, residential security and monitoring companies therefore were the only traditional access points to the consumer for HVAC, security systems and lighting. Typically, such services were sold separately and were wire-based.

3. EFFECT OF THE IOT ON SUPPLIER BASE AND DISTRIBUTION CHANNELS

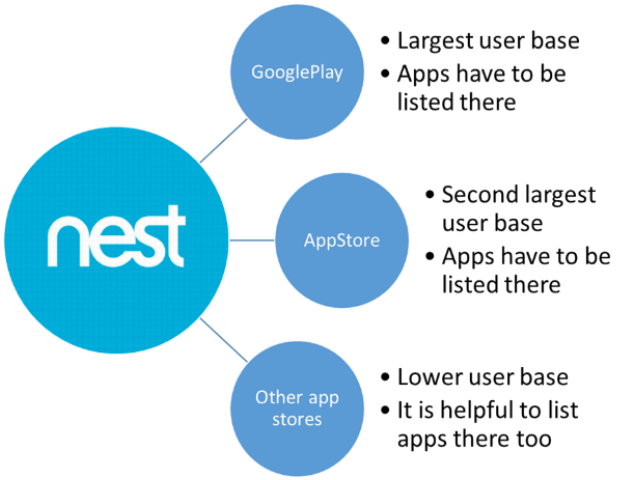
Without the availability of wireless connectivity and the widespread use of smartphones amongst consumers, there would not be a market for smart homes. By the same token, wireless communication was the cradle of DIY installed smart home devices. Connecting wires is electricians' and installers' work. The less wires to connect, the higher the likelihood of a DIY project. While wireless networks and smart *phone* technology were available in the 1990s, it was only 10 years later that they became mainstream – somewhere around year 2007, when iPhones became popular.[4] Around the same time, the first wirelessly connected household electronic devices came on the market (e.g., the Ecobee thermostat), that could be programmed online and communicate with a remote sensor. This arguably made smart home products more popular.

[4] https://www.flashrouters.com/blog/2015/08/07/what-is-wi-fi-router-wireless-router-faq/ https://www.cnbc.com/2017/01/09/apple-iphone-turns-10-heres-a-look-at-the-smartphone-through-the-last-decade.html#slide=1

Published: December 2017

Three years later, after 2010, a number of start-ups were founded to cater to the market for DIY home automation and self-monitoring via cell phone apps, thereby disrupting the business of installers, electricians, and home monitoring companies and boosting retail business. It is understandable that "DIY start-ups" chose to sell through retailers. If you intend to install a device on your own, why would you buy it from an installer? Instead of buying directly from a manufacturer, consumers could purchase directly from a retailer where they compare brands and prices. Hence, "DIY start-ups" initially did not bother to build or acquire professional channels to distribute their products, but went straight to big box and online retailers.

Yet, professionally installed products were far from extinct, and also largely evolved into wireless devices, saving installers considerable installation time while retaining the same installation business while entering new lines of business. With the development of home automation systems, new service providers from different industries entered the market, providing an alternative to electronics dealers, HVAC dealers and monitoring companies.



Whether the hardware is distributed through retail or service providers, the corresponding software app of smart home devices is always distributed through the app store of the common cell phone operating systems, which would be mainly Google Play for Android and App Store for iPhone. For Samsung Galaxy for example, apps can be downloaded through Samsung's own app store or through Google Play. Being part of Samsung, the SmartThings app in particular is pre-installed on Samsung phones. Many smart home suppliers provide their apps for free, especially when their business model is centered on device sales or installation services, rather than Software as a Service (SaaS). Fees for access to the cloud most often occur in context of security camera cloud recording and professional monitoring of security systems.

Some manufacturers of security cameras have started to offer cloud recording for free. Due to price competition, cloud recording may not be a sustainable method of generating future recurring revenue. Other ways to secure revenue might include: system integrators charging fees for remote system upgrade and maintenance, and in-app advertising revenues.

To illustrate the trend of device sales towards retail and alternative service providers, the author individually looked into the markets for HVAC systems/thermostats, security systems, AV systems and lighting - the core components of modern home automation systems. While all home automation products experienced the same general trend, details

Published: December 2017

including type of new service providers and market segments vary depending on the type of device.

3.1 Thermostats

Thermostats used to be included with HVAC systems (e.g., Carrier, Trane, Lennox), or from a controls manufacturers (e.g., Honeywell, Lux, Braeburn or Emerson), and were typically professionally installed. With the 2011 launch of Nest's Learning Thermostat, thermostats shifted from purely being distributed via the professional channel towards retail and direct sales.

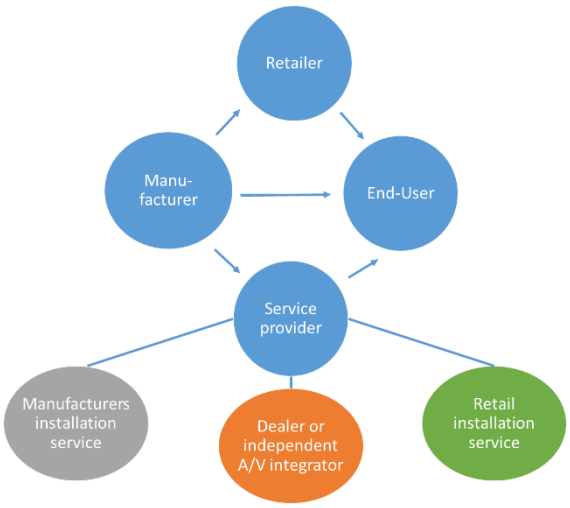


Figure 2 A selection of Smart Thermostats and their distribution channels at launch

Brand	Model	Launch year	New feature	Channel at time of launch*
Ecobee	Smart Thermostat	2008	Interdevice communication external sensor	Professional
Nest	Learning Thermostat	2011	Learning user preferences	Retail**
Ecobee	Ecobee3	2014	Demand response program	Retail
Honeywell	Lyric	2014	Geofencing capability	Professional Retail

*All of the indicated companies sell directly, other channels than direct sales are listed in the table.

**Nest established a certified dealer program soon after launch, however installers did not push the product and retail remained the main channel.

Source: Katherina Sutter, 2017.

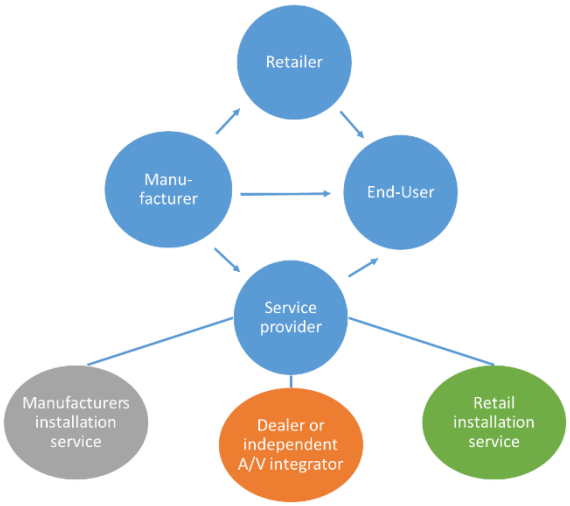
While thermostats had already shifted to Wi-Fi connectivity and interconnection with remote sensors prior to 2011, Nest untapped new purchasing and selection criteria in the

Published: December 2017

form of thermostat design aesthetics, added new functions and was the first company to position a thermostat as a DIY product.

In 2017, smart thermostat manufacturers do not singularly rely on one channel. In addition to selling through retail, Nest now trains and licenses professional "Nest Pro" installer contractors to reach end-user segments that want a home automation system rather than just a thermostat or lack time to spend on DIY projects and have the budget to pay for installation services. Nest offers an extended warranty on professionally installed thermostats, setting an incentive to have the thermostat professionally installed. Companies like Honeywell, who traditionally used the professional channel only, now has thermostat models that are sold through retail, such as the DIY version of Lyric. Finally, retailers including Best Buy, offer thermostat installations through on site-staff like Geek Squad.

3.2 AV (audio/visual) and entertainment systems



After the boom of iPod and (DIY) Wi-Fi speakers and after the world started recovering from the 2008 recession, the business of audio video (AV) integrators started to rebound as well.[5] It has been enjoying steady year-over-year growth, driven by demand for professional audio and video installations and in particular home theaters[6], but also assisted by demand for setup of connected lighting and security products. Apart from selling products through AV integrators, manufacturers also sell them directly and through retailers, often offering manufacturer or retailer managed installation service. In summary, professional and DIY installation are both common place for audio and video equipment.

[5] http://hometheaterhifi.com/editorial/decline-high-end-audio-sales-new-outlook/
http://ohmspeaker.com/news/the-golden-age-of-audio/

[6] http://www.grandviewresearch.com/industry-analysis/home-audio-equipment-market

Published: December 2017

3.3 Lighting

Wireless connectivity and IoT also will affect lighting distribution. Completely wireless solutions like those that Phillips offers (the Hue product lineup) are DIY products and sold through retail. With a bridge that enables online access and connectivity with other devices and brands, the end-user has the option to add on other devices to build a home automation system. There are products, such as those from Lutron that are still predominantly professionally installed through service providers like electricians and AV integrators. However, such products are now also available through retail.

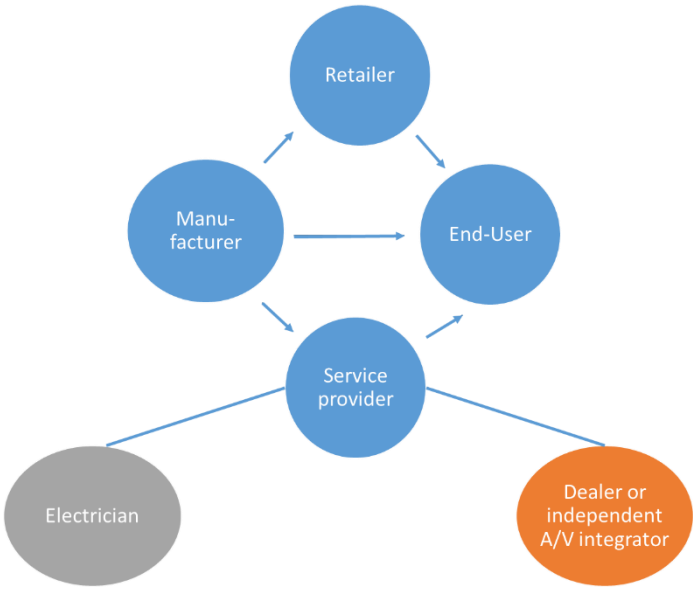


Figure 3 A selection of smart lighting kits and their distribution channels at launch

Brand	Model	Launch year	New feature	Channel at time of launch*
Philips	Hue	2012	Control via app, completely wireless	Retail
Belkin	Wemo	2014	Interaction with sensors and smart plugs	Retail
Lutron	Caseta	2014		Retail and professional channels
Other brands (Cree, LiFx, Osram, etc.)	N/A	2015 onwards	Similar features	Retail and professional channels
Ikea	Tradfi	2017	Similar features	Retail

Source: Katherina Sutter, 2017.

Philips Hue is the equivalent of Nest for lighting, since it introduced a new concept: complete wireless lighting installation (lighting systems that can easily be DYI-installed without the need to connect wires). The product was initially available for purchase through retail only. Adopting the DIY concept, other companies followed suit with

Published: December 2017

competing products. Some DIY brands diversified their distribution mix of smart lighting to include both retail and professional installation.

3.4 Security systems

For the sake of comparing "like for like" when comparing traditional security systems with DIY security systems, the following overview focuses on complete systems, including external motion sensors and alarm. Main suppliers of security systems have traditionally been professional monitoring services like ADT and Protection 1, which directly, or through affiliated dealers, sell their systems to the end-user and remain the contracting party in context of the monitoring contract.

With the increasing popularity of DIY and Wi-Fi connected products, channel shares soon shifted from monitoring service providers to retailers and independent professional installers. A few companies launched wireless security systems, but companies selling Wi-Fi security cameras as individual products were exponentially expanding.

Figure 4 A selection of smart security systems and their distribution channels at launch

Brand	Launch year	Initial features	Channel at launch
Honeywell Lynx Touch	2012*	Wi-Fi control panel supporting Wi-Fi connected siren, sensors and cameras	Professional Installer, Retail*
SmartThings	2013**	motion sensors, camera, siren**	Retail
Ismart Alarm	2013	motion sensors, cameras, siren	Retail
Canary	2014	One-piece system	Retail
Scout	2014	Motion sensors, cameras, siren	Retail
D-Link	2015	motion sensors, cameras, siren	Retail
Piper	2015	One piece system	Retail

*Product was initially pro-installed but had DIY friendly updates and was later also made available through retail.

**Camera and compatible siren were added later.

Source: Katherina Sutter, 2017.

While Honeywell worked with professional installers to supply their first Wi-Fi alarm system in 2012, companies like Canary, iSmartAlarm or SmartThings did not have a network of distributors or offer installation services, but they still succeeded in getting

Published: December 2017

their product to the end-user by selling it through retail- or direct sale. Traditional security systems installers and service providers were not the only access point to the user base any more. Even Honeywell – mostly targeting their security systems at professional installers – offers an updated Lynx Touch alarm kit that is now also available through retailers, which some end-users install themselves.

Even though most DIY security system suppliers started off with retail, Nest is now launching its first security system with optional professional installation and optional monitoring service through the security and monitoring company MONI. It will be interesting to see whether other DIY brands will follow suit and also diversify their channels by referring their customers to professional installers and monitoring services.

DIY security systems reached a sizeable customer base. Download counts of their respective apps give an indication of their popularity and market shares. The new brands gained share partly by addressing new end-user segments and partly by eroding the user base of established brands.

Figure 5 Download count of major smart security systems manufacturers

Brand	Download count (range) on GooglePlay*
D-Link	100,000-500,000
SmartThings	100,000-500,000
Canary	100,000-500,000
Honeywell Lyric	100,000-500,000
Piper	50,000-100,000
iSmartAlarm	50,000-100,000
Scout	5,000-10,000
Honeywell Lynx	1,000-5,000

*Google Play is the most used app store, but only indicative of market share as iPhone users use Apple's AppStore, which does not publish download statistics.

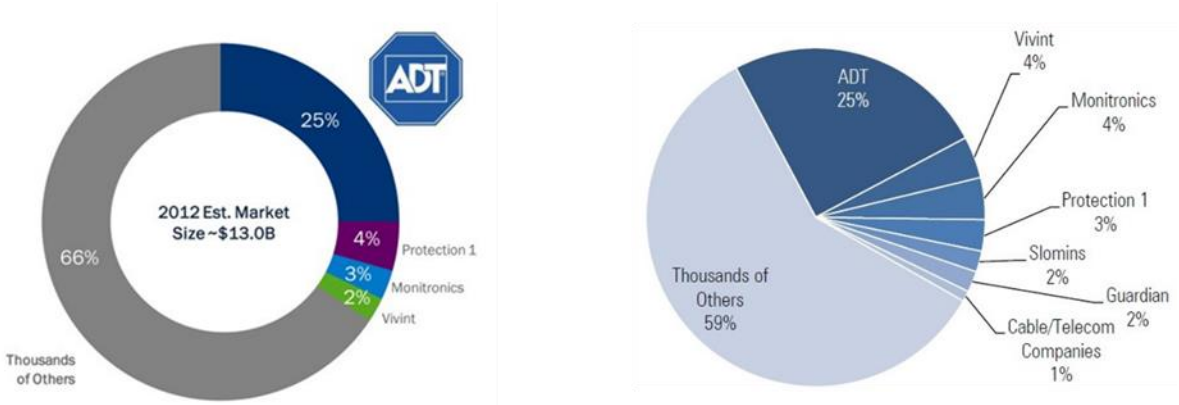
Source: Katherina Sutter, September 2017 reading from GooglePlay.

The above mentioned DIY brand listing does not include the monitoring service providers that also entered the market around the turn of the decade, following the widespread use of Wi-Fi. Not surprisingly, players from the wireless telecommunication and cable industries, including amongst others Internet providers Comcast (Xfinity) and Time Warner Cable joined the market for home automation and security around the turn of the decade providing a choice of professional monitoring or self-monitoring.

Published: December 2017

ADT claimed to have 25 percent of a $13 billion market (total American revenues from home security end-users) in 2012, with a customer base of about seven million. A study carried out a little later, cited by Morningstar, Inc. in 2013[7], shed light on telecom and cable companies that combined were estimated to have a 1 percent market share, i.e., $1.3 billion, a fraction of which was allocated to Xfinity.

Figure 6 Market shares security system sales (revenue as % of market value) in 2012



Sources: ADT, Bain analysis, Morningstar.

Since then, ADT's customer base using its smart security system pulse grew by 43 percent from 1.4 million to two million users in the four years between 2013 and 2017.[8] In the timeframe between 2013 and 2017, the Xifinity home customer base grew by 100 percent to one million,[9] and AT&T grew its user base to half a million.[10]

[7] http://ibd.morningstar.com/article/article.asp?id=644538&CN=brf295,http://ibd.morningstar.com/archive/archive.asp?inputs=days=14;frmtId=12,%20brf295

[8] http://www.cepro.com/article/adt_reports_75_of_new_customers_now_buy_adt_pulse

[9] http://www.fiercecable.com/cable/comcast-challenging-incumbent-adt-home-security-market-ihs-says

[10] http://fortune.com/2017/08/18/att-might-be-selling-off-this-security-business/

Published: December 2017

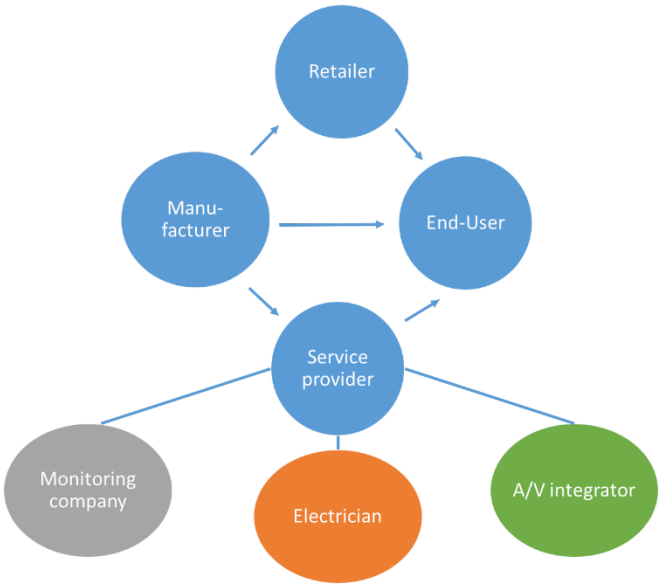
Figure 7 – user base (in number of users) of ADT compared to Xfinity, Time Warner Cable (TWC) and AT&T

Source: Katherina Sutter, 2017 with third party data.[11]

The user base of the three largest alternative monitoring service providers who joined the market from the telecom and cable industries has grown close to the market leader's overall user base for wireless security systems.

The home monitoring market entry by AT&T, Time Warner Cable and Comcast is an example of alternative monitoring service providers who entered the evolving IoT market early. Others followed suit.

Manufacturer-to-end-user direct sales of security systems are often promoted by other industries like insurance and home warranty services providers. An emerging trend is promoting security products through end-users with the help of a referral program initiated by manufacturers, again often leading to a direct sale.



3.5 All products

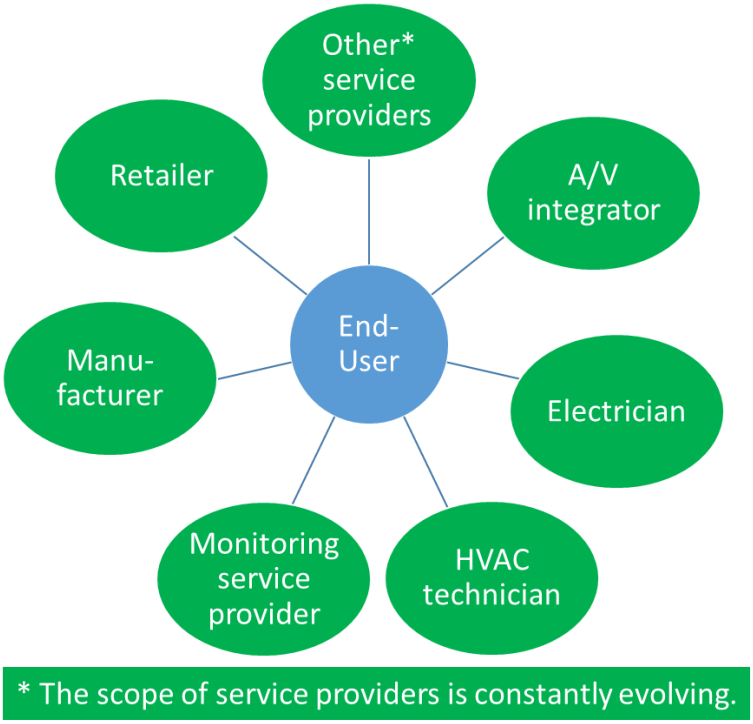
For all of the categories of home automation devices discussed above, there is now a substantial amount of retail sales, an increasingly wide range of service providers and a

[11] ADT, 2017; Comcast, 2017; Reuters, 2017.

Published: December 2017

minor amount of direct sales. Promotion of smart home platforms and devices is now also done in cooperation with other industries, and is further discussed in section 4.3 of this paper. Peer-to-peer applications for home automation installation services are being pilot tested,12 and may disrupt the home automation service business in the future.

Figure 8 – Overview over service providers for home automation products



4. DISTRIBUTION STRATEGIES FOR SMART HOME DEVICES

Distribution strategy depends on end-user segment, product type (equipment type and ease of installation) and business model (specifically source of revenue generation and pricing strategy).

4.1 By end-user segment

End-users' generation, stage in life, disposable income, and time all impact their interest in home automation; their purchasing motivation (e.g., security or energy efficiency or entertainment); and their go-to point of sale.

[12] https://www.cepro.com/article/uber_for_smart_home_arrives_tech_savvy_neighbors_mila_orange

Published: December 2017

Millennials have been identified by Nielsen as the most dominant end-user group when it comes to demand for smart home products.[13] The development of IoT coincides with the millennial generation having come of age. It also coincides with a retiring baby boomer generation.

Millennials enjoy high purchasing power as they have joined the work force and many of them receive financial support from their retiring parents (baby boomers).[14]

In addition, the older half of the millennial spectrum also has reached the age where they have babies and are buying their first home, meaning they are at a stage in life where they have a "need" for smart home devices.[15]

Due to their early childhood exposure to technology, millennials are more likely to try a home automation DIY project than other generations and therefore more likely to shop at big-box or online retailers.

In terms of purchasing motivation, as per Nielsen, wireless home security and home automation devices like lighting and thermostats are the most popular ones. Amongst those, the interest in wireless home security is higher than that in smart thermostats and lighting, which is trailed by the interest in smart, wireless sound systems. Also, security systems are more popular than individual security cameras, and professionally monitored systems are still more common than self-monitored systems.[16]

Which brings us to distribution strategy. Looking at the above mentioned statistics, security systems and monitoring service providers are a point of sale for smart home products preferred by a relatively large segment of end-users, which is why it makes sense for smart home device manufacturers to use monitoring service providers as a distribution channel. At the same time, due to the growing share of millennials amongst consumers, retail and in particular, online retail, are major segments within distribution channels. It is worth noting that the standalone DIY home automation equipment meets the needs of end-user segments beyond those who would buy a security system; DIY enthusiasts that would not normally buy a security system but would install a camera for other reasons. For example, they would buy a camera to 'monitor' and take pictures of their dog while they're not at home, and enable them to remotely communicate with their pet.[17] Or they would buy a Nest thermostat because it looks nice. In conclusion, there is a viable, albeit relatively

[13] http://www.nielsen.com/us/en/insights/news/2017/connecting-and-protecting-the-big-investment-how-consumers-use-technology.html

[14] https://www.cnbc.com/2017/04/25/heres-how-much-money-the-average-first-time-home-buyer-makes.html

[15] http://www.pewresearch.org/fact-tank/2017/05/11/6-facts-about-u-s-mothers/

[16] http://www.nielsen.com/us/en/insights/news/2017/connecting-and-protecting-the-big-investment-how-consumers-use-technology.html
http://www.nielsen.com/content/dam/corporate/us/en/public%20factsheets/connected-life-sell-sheet.pdf

[17] http://w5insight.com/ruff-life-millennials/

Published: December 2017

small market segment that can much easier be reached via retailer than through a service provider.

If the end-user is more interested in an individual device, they are more likely to buy it through retail, whereas if the end-user wants a full-fledged home automation system, they are more likely to hire a professional service provider. A buyer just wanting a Honeywell wireless water leak detector does not necessarily want a security system, HVAC system or home theater to come with it, and would not contact a monitoring company, AV integrator HVAC installer or electrician, but just go to a DIY store.

However, even when the devices can be purchased individually, manufacturers generally have an interest in offering installation services, in case an end-user with lack of time and technical skills wants to buy the whole system, or just to ensure individual devices are installed correctly.

For example, Hisense sells their new laser TV directly to the end-user and through retail, but offers installation by Hisense's own installers. Retailers on their end have onsite installers (e.g., Geek Squad) or refer installers (Amazon and Nest). Wink teamed up with Pro.com to offer installation services.[18] According to Honeywell, 50 percent of Honeywell's DIY thermostats purchased at retailers end up being professionally installed.[19]

In summary, it makes sense for a manufacturer to use a variety of distribution channels to reach a maximum scope of end-user segments. How they leverage the channels and which channel they emphasize and use as a core distribution strategy depends on the business model of the manufacturer.

4.2 By business model

Firstly, a business model for home automation can be product centric (revenue generation through sales of devices) or service centric (revenue generation through installation, monitoring service or other SaaS). Examples of companies with a product centric business model would Nest and the SmartThings division of Samsung (product predominantly sold through retail). Examples of companies with a service centric business model would ADT (product sales exclusively tied to monitoring contracts) and Comcast (products sales always generating some kind of recurring revenue).

Secondly, a product can be a relatively complex and high tier or appeal to a smaller budget. High tier products like Control4 controls tend to be professionally installed even though the company has a product centric philosophy. Part of the reason control of quality and customer experience can be assured through limiting installation to certified dealers for integration with fully compatible products. To the contrary, the SmartThings hub would be an example of a 'budget' product that is predominantly sold through retail. SmartThings place less emphasis on enforcement of exclusivity and compatibility. Users encountering

[18] http://blog.wink.com/wink-blog/2015/6/15/procom-partners-with-wink-to-make-smart-home-installation-even-easier
[19] https://www.cepro.com/article/smart_thermostats_diy_consumers_pro_installer_honeywell_homeadvisor

Published: December 2017

compatibility- or other technical issues can join an online forum to find help to problems that come up during DIY installation.

Nest and SmartThings are at the far end of the spectrum, i.e., they are clearly product centric in terms of business model and emphasizing retail distribution. While Nest and SmartThings now have a diversified distribution approach, retail remains their main distribution channel. Nest started its certified dealer program soon after the launch of their first product, but initially the program lacked incentives for HVAC contractors to promote the Nest thermostat.

Inversely, service centric suppliers started to diversify into retail distribution while keeping an emphasis on the professional channel. For example, security systems provider Vivint, even though they rely on revenues from monitoring services offers their products through consumer electronics retailer Best Buy (through Vivint representatives), while also keeping their network of professional installers.[20] Vivint clearly diversified their distribution mix. Thermostat, fire and security system provider Honeywell has launched a variety of wireless and communicating product lines such as Lyric and Lynx. These product lines both have models for professional installation and DIY versions. Honeywell continues to emphasize professional installation in their distribution strategy – part of the aim being setting the brand apart in terms of quality, avoiding complications in context of faulty self-installation, and as a result achieving higher customer satisfaction.[21] However, Honeywell's business model is more product centric and not entirely tied to installation and monitoring services, which may be a contributing factor to their decision to allow retail distribution of both the DIY and the professional version of their thermostat.

DIY products generally started off with retail sales and some direct sales. This made sense as DIY customers would typically shop in retail, but it was also partly due to lack of other options; professional installers and monitoring services would initially not be interested in selling less known DIY devices at low margins. Today, the increased popularity of certain DIY brands represents an incentive for professionals to install them. End-users ask installers to install popular DIY brands, creating a market pull effect. As some DIY brands have become very popular, at times dealers now give them away to customers as a hook for a potential purchase of further products and installation services.[22] Maybe as a consequence of noticing the market pull effect of popular brands like Amazon Echo, Nest and Phillips Hue, more companies are now actively diversifying their distribution approach.

The Skybell doorbell for example, initially only sold through retail, is now also and increasingly often sold through monitoring service providers in integration with a

[20] http://www.businessinsider.com/vivint-best-buy-partner-to-expand-smart-home-ownership-2017-5
[21] https://readwrite.com/2014/06/11/honeywell-and-vivints-new-smart-home-platforms-openness-is-overrated/
[22] https://www.cepro.com/article/smart_home_dealer_drops_amazon_echo_on_doorsteps_gets_control4_business

Published: December 2017

compatible security system. Other service providers, such as certified integrators of other compatible home automation platforms also form part of Skybell's distribution system.

Observing the trend towards professional installation of DIY brands, distributors are now also starting to carry popular DIY devices in order to be a one-stop shop for their professional customers.[23] The initiative distributors are now taking to increase the range of brands they carry, which maybe an opportunity for recently launched and less established DIY brands to get access to the market through distributors.

In summary, even though the classical business models of service centric vs. product centric business and high tier vs. budget product positioning still exist, the majority of suppliers have diversified their distribution approach.

4.3 Cross Selling and Promotion

Service providers often sell devices of competing brands due to the strong market pull. The Nest thermostat for example is sold through a variety of competitor organizations, including: Vivint dealers, even through Vivint launched their own thermostat.[24] and through ADT as an incentive for their customers to sign up to a monitoring contract.

But it does not end there. Cross selling and promotion transcend industry boundaries. Examples of home automation products and services promoted by service providers from other industries abound. Just to mention a few: Airbnb promotes Vivint; a variety of insurance providers promote the Canary security camera; and Cross Country home services promotes SmartThings. Large builders are important product and brand specifiers, as they Wi-Fi certify homes and sell them with pre-installed smart home devices. With the energy savings function of programmable devices, utilities also emerge as promoters of home automation devices (Ecobee, etc.), involving credits and incentives to purchase smart thermostats.

Benefiting from market concentration in the utility sector and their large customer base, utilities can have a big impact on the market share of home automation devices. Utilities also have a vested interest in supporting the adoption of smart devices as it opens up opportunities of implementing demand response programs. For the introduction of demand response programs, manufacturers' cooperation and investment is needed in developing and introducing the necessary software into their products. Device manufacturers need to have a business case to make such an investment. Further research is needed to determine what business model would be ideal to establish and finance a demand response program. Smart home business models include:

23 http://www.twice.com/hey-dealers-smart-home-knocking-and-distributors-can-let-it/64694
24 https://www.vivintsystems.com/products/

Published: December 2017

- **SaaS**
  - Most companies charge end-users a fee for cloud recording of security cameras for example, but with some new start-ups that offer cloud recording for free[25], price competition is intensifying.
- **Monitoring services**
  - Monitoring service providers cover a variety of cost components through their monitoring subscription fee.
- **Installation and system maintenance**
  - System Integrators charge returning revenues for remote monitoring, upgrade and maintenance of systems, one of the upgrades can be enabling of demand response programs.
- **The sale of smart home devices and hubs**
  - Higher priced systems with expensive hubs/ smart home controls would offer a faster payback for a manufacturer to make such an investment than the budget starter kit.

There are a number of manufacturers that offer thermostats that already work with demand response programs and could be used for case studies on suitable business models:

- Alarm.com connects thermostat, security system and the corresponding monitoring contract, using its acquired platform Energyhub for demand response program.[26]
- Honeywell's products "can be demand response enabled using a remote software upgrade."[27]
- Nest "runs successful energy efficiency and demand response programs with some of the largest energy providers in North America"[28].
- Ecobee integrates "seamlessly with leading demand response management systems (DRMS)"[29]

Utilities promote participation in demand-response-programs along with compatible smart devices by offering rebates, credits or incentives to the end-user.[30]

Promotion of smart home devices can be carried out in a targeted manner. Rather than mass media, service providers with a large user base such as insurances and utilities can

[25] See for example Skybell. https://skybelltechnologies.zendesk.com/hc/en-us/articles/203256535-Does-SkyBell-charge-a-monthly-fee-to-store-my-videos-

[26] https://www.alarm.com/get_started/finddealer_survey.aspx?q=A4EDADF2E02D6F5E5C6EEAEC2C63B1DF

[27] https://www.honeywellsmartgrid.com/en-US/S_S/DR/Resi/Pages/default.aspx

[28] https://nest.com/energy-solutions/

[29] https://www.ecobee.com/utilities/

[30] https://www.ecobee.com/2014/10/how-incentives-rebates-and-on-bill-credits-work/

Published: December 2017

make the difference. In the case of DIY devices, promotion through such service providers increases the likelihood of a direct sale from the manufacturer to the end-user.

5. SMART HOME, COMPATIBILITY AND MARKET DYNAMICS

IoT started to be a buzzword at the beginning of this decade and is now omnipresent. Wireless communication, smart phones and the Internet made it technically possible for the user to remotely manage devices through online platforms and cell phone apps. Device-to-device communication goes one step further and is now "state-of-the-art" for household electronics. Device-to-device communication makes compatibility essential to access all functions of the system. Only compatible devices can communicate.

Some end-users purchase a hub from a certain brand but like to mix and match components of different brands to build a system; other end-users have a preferred service provider, but would like to use devices from a variety of brands. Aesthetic design and range of functions of individual devices are now the focal point with the development of IoT and the expansion of the device-centered DIY market.

As a consequence, besides distribution, compatibility strategy becomes essential to a product's success. From the perspective of a device manufacturer and platform provider, making competing devices compatible with your platform will promote your home automation platform and interface. Your device sales can benefit or suffer as a consequence, depending on the net effect between device cannibalization, increased use of your platform and possibly the effect of reverse-compatibility of your devices with the partner device manufacturer's platform.

Platform providers can belong to a variety of industries, e.g., classical professional monitoring, HVAC or appliances, cable, telecom, software or e-commerce. In the recent years, suppliers of cell phone operating systems and voice control became more powerful as they were already providing user interfaces in a different context that just had to be applied to home automation systems. DIY hubs like Google Home, Apple Home Kit and Samsung SmartThings have become focal points of compatibility between competing brands.

SmartThings, Apple Home Kit/ Siri and Amazon Echo/ Alexa are each compatible with over 30 other brands. Interestingly, there is a huge overlap of compatible brands amongst those three systems, indicating it is largely devices of the same manufacturers that are compatible with most the commonly used DIY hubs. For example, Nest Thermostats, Phillips Light Bulbs and August Door Locks are each compatible with all three of the above mentioned hubs.

Professional installation and monitoring service providers also integrate other brands. ADT Pulse for example supports about 10 other brands; Xfinity Home supports seven other

Published: December 2017

brands; Verizon Digital Life supports a handful of compatible brands; while Time Warner only support one other compatible brand.

The above examples suggest that DIY hubs lean towards maximizing compatibility while service centered companies have a more conservative compatibility strategy. It may play a role, that service centered companies usually had an established subscriber base before launching connected products, whereas DIY home automation product start-ups started off with a user base of zero and needed to cooperate to build their user base. However, compatibility strategy is more complex than that, and its complexity calls for further discussion.

6. SUMMARY

This White Paper demonstrates that the overall distribution trend for home appliances is channel diversification, to meet a variety of consumer segments exhibiting a variety of needs and purchasing behaviors.

In fact, today's end-users show preferences for multiple points of sale including retailers, system integrators and a variety of other service providers. Regardless of the end-user segment, the *less* complex the home automation project, the more likely the corresponding devices are purchased from a retailer. The *more* complex the smart home system to be installed, the more likely the product is purchased directly from a professional installer, system integrator or monitoring service provider.

A diversified distribution strategy is justified to reach all end-user groups and provide for all use cases. The direction and degree of channel diversification and the weight of the different channels in the balance of their overall turnover depends on each manufacturer's original business model and distribution approach.

The push towards retail came from two directions around the turn of the decade and increased within the last seven years, as manufacturers of 100 percent professionally installed products added retail sales to their distribution mix, and start-ups and manufacturers from other industries launched DIY products being sold directly and through retail only.

Insurances companies and utilities have emerged as effective advertisers and "sales reps" for security systems and thermostats. End-users who find out about a smart home device or system from insurances companies and utilities often purchase it directly from the manufacturer. An end-user to end-user referral and rewards scheme could also promote direct sales in the future.

At present, there are indications of a reverse shift towards the professional channel. DIY product manufacturers are moving from selling only through retail, to diversifying their

Published: December 2017

distribution mix to include manufacturers' own installation services, sales through professional installers and sales through monitoring service providers.

Published: December 2017

REFERENCES

1. Amanda Green (Jan 1, 2015). A Brief History of Air Conditioning. PM Journal. Electric Light. Wikipedia. Retrieved August 10th, 2017.
2. Karen C. S. Donnelly (1992). Domestic Security: The Holmes Burglar Alarm Telegraph, 1853-1876.
3. Home Security System Utilizing Television Surveillance. United States Patent 3482037. Issue Date December 2, 1969. United States Patent and Trademark Office. Retrieved from http://www.freepatentsonline.com/3482037.html on October 2nd 2017.
4. Arjun Kharpal (Jan 9th, 2017). Apple's iphone turns 10: A look at the smartphone through the last decade. CNBC. Retrieved October 2nd, 2017.
5. John E. Johnson (August 22nd, 2016). The decline in high end audio sales: A new outlook. Hometheatrehifi.com. Retrieved October 2nd, 2017.
   John Strohbeen (December 27th, 2016). The Golden Age of Audio. Ohmspeaker.com Retrieved October 2nd, 2017.
6. Grandview Research (February, 2015). Home Audio Equipment Market Analysis by Product (Home Theater In-A-Box, Home Audio Systems, Home Radios) and Segment Forecasts To 2020.
7. James Krapfel, CFA (April 25th, 2014): ADT's Moat Less Secure. Morning Star Inc. Retrieved October 2nd, 2017.
8. Jason Knott (July 31st, 2015). ADT Reports 75% of New Customers Now Buy ADT Pulse. CE Pro. Retrieved October 2nd, 2017.
9. Daniel Frankel (April 28th, 2017). Xfinity Home hits 1M customer milestone, Comcast calls market '$9B opportunity'. Fiercecable.com Retrieved October 2nd, 2017.
10. Reuters (August 18th, 2017). AT&T Might Be Selling Off This Security Business. Fortune.com. Retrieved October 2nd, 2017.
11. ADT LLC (April 6th 2017). ADT Hits Industry Milestone; Company Announces 2 Millionth ADT Pulse Home Automation Customer. News.ADT.com. Retrieved October 2nd, 2017.
    Daniel Frankel (April 28th, 2017). Xfinity Home hits 1M customer milestone, Comcast calls market '$9B opportunity'. Fiercecable.com Retrieved October 2nd, 2017.
    Reuters (August 18th, 2017). AT&T Might Be Selling Off This Security Business. Fortune.com. Retrieved October 2nd, 2017.
12. Julie Jacobsen (April 5th, 2017). Uber for Smart Home Arrives, Powered by Tech-Savvy Neighbors. Cepro.com. Retrieved October 2nd, 2017.
13. Nielsen (Q4 2017). Connected Life Report. Nielsen.com. Retrieved October 2nd, 2017.
14. Ester Bloom (April 25th, 2017). Here's how much money the average first-time homebuyer makes
15. Kristen Bialik (May 11th, 2017). Six Facts about US Mothers. Pewresearch.org. Retrieved October 10th, 2017.

Published: December 2017

16. Nielsen (Q4 2017). Connected Life Report. Nielsen.com. Retrieved October 2nd, 2017.
17. Sarah Knapp (June 14th, 2017). The Ruff of Millennials. w5Insight.com. Retrieved October 2nd, 2017.
18. Wink (June 16th, 2015). Wink + Pro.com: Smart Home Installation made easy. Blog.wink.com. Retrieved October 2nd, 2017.
19. Julie Jacobsen (May 24th 2017). Smart Thermostats: 50% of Consumers Who Think They Can Install DIY … End Up Calling a Pro. Cepro.com. Retrieved October 2nd, 2017.
20. Nicholas Shields and Peter Newman (May 8th 2017). Vivint and Best Buy partner to expand smart home ownership. Businessinsider.com. Retrieved October 2nd 2017.
21. Adriana Lee (June 11th, 2017). Openness Is Overrated: Honeywell And Vivint's New Smart Home Platforms. Readwrite.com. Retrieved October 2nd, 2017.
22. Julie Jacobsen (April 21st, 2017). Smart-Home Dealer Drops Amazon Echo on Doorsteps, Gets Control4 Business. Cepro.com. Retrieve October 2nd, 2017.
23. Alan Wolf (April 3d 2017). Hey Dealers: The Smart Home Is Knocking And Distributors Can Let It In. twice.com Retrieved October 2nd, 2017.
24. Vivintsystems.com./products Retrieved October 2nd, 2017.
25. Skybell. Does SkyBell charge a monthly fee to store my videos? Skybell.com Retrieved October 2nd, 2017.
26. Find an Alarm.com Service Provider. Alarm.com Retrieved October 2nd, 2017.
27. Demand Response Program for Residential Customers. Honeywell.com. Retrieved October 2nd, 2017.
28. Nest.com/energy-solutions. Retrieved October 2nd, 2017.
29. Ecobee.com/utilities. Retrieved October 2nd, 2017.
30. Andrew Newton (October 14th 2014). How incentives, rebates, and on-bill credits work. Ecobee.com. Retrieved October 2nd, 2017.

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