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The State and Future of The Home Automation Market

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Introduction

The home automation market is undergoing a progressive transformation propelled by the proliferation of smartphones and tablets. In addition to cellular technologies, home automation devices integrate different local and personal area technologies to connect among peripherals. This led to a new phase of evolution in home automation systems where wireless technologies enable connectivity for monitoring and control from anywhere at any time. Home automation solutions have broken through the early-adopter market phase. Mass market adoption on the other hand is yet to materialize leaving a great potential ahead for the next phase of development in a very dynamic market that's in the process of being defined. In this paper, we outline the main characteristics of the home automation market and expose trends are shaping the market, raising challenges, and creating new opportunities.

Market Characteristics

The home automation market comprises multiple segments, including:

a. Lighting control (e.g. switches, dimmers)

b. Security & access control (e.g. video surveillance, intrusion detection)

c. HVAC control (e.g. thermostat)

d. Entertainment control (e.g. home theater)

e. Outdoor control (e.g. landscape)

We observe the following characteristics of the market for this market which outline the dynamics among various stakeholders:

Silo segments: The market is siloed into segments without support for unified interface or interaction. For example, HVAC is independent from security control systems leading to different user experience.

Fragmented use cases: Distinct use cases and applications result in fragmentation across multiple fault lines including markets and technologies.

Uneven adoption: Some market segments are more mature than others, in part due to market and distribution channels. For example, HVAC and security control are well established while lighting control is emergent propelled by regulatory requirements and incentives especially in EU countries.

Non-interoperable technologies: Vendors select the technology and protocol stack that best meet the application requirements leading to a proliferation of non-interoperable systems. Attempts are underway to bridge this gap through industry alliances and organizations which began taking shape in late 2013 and has accelerated since.

Security risks: Security shortcomings are alarming across a wide range of products. Examples include lack of enforcement of strong passwords, nonexistent support for

mutual authentication, or absence of protected accounts against brute-force attacks[1]. Mobile applications are specifically vulnerable with estimated 20% not using encrypted communications to the cloud[2].

Inconsistent performance: Reliable connectivity is lacking due to a complex deployment scenario where signals could easily be blocked or be subject to interference from other systems operating in the same spectrum.

Market Players

Home automation is an active market with many players approaching it from different angles:

Technology giants: Apple (HomeKit, iOS), Google (Nest, Android), Samsung and Microsoft (Xbox, Windows) best exemplify this segment. These companies leverage the operating system of mobile devices, their incumbency in the Internet platform business, and the Cloud infrastructure to expand into the connected home market. New players are also entering this space with significant foreseen growth include Alibaba, Amazon and Xiaomi.

Industrial conglomerates: GE, Honeywell, Phillips, Schneider, and others, manufacture a wide range of appliances and home devices. Their centers on ensuring interoperability with home automation hub vendors as they seek to make their solutions as widely available to the market as possible. Some of these companies have decided to enter into the home hub market (e.g. GE, Honeywell) but others have kept out (e.g. Phillips).

Consumer electronics: Sony, Panasonic, LG and Samsung have incorporated connectivity into their products. The TV is often used as a control hub. This strategy works when devices are from a single vendor as interoperability between different vendors is challenging.

Product specialists: This segment includes manufacturers of different home products such as locks, alarms, sensors, garage door controllers, and other products. August, Big Ass Fans, Kidde, Rachio, Schlage, Skybell, Yale are examples of this segment. Product specialists focus on incorporating wireless connectivity into their products and integrating with a multiple home gateway vendors.

Service providers: This segment includes connectivity service providers (mobile and fixed access service providers) as well as monitoring specialists like ADT and Vivint who offers their own home automation systems. Connectivity service providers developed home automation products in partnerships with product specialists. The business model is based on recurring fees, for example, AT&T Digital Home allows monitoring of security and energy starting at $5/month. The trend if for service providers to become a one-stop-shop for home automation devices, gateways and Cloud service as exemplified by KT, NTT DoCoMo and PCCW.

[1]*HP, "HP Study Finds Alarming Vulnerabilities with Internet of Things (IoT) Home Security Systems," February, 2015.*

[2]*Symantec, "Security Response: Insecurity in the Internet of Things", Mario Ballano Barcena and Candid Wueest, Version 1.0, March 12, 2015.*

Startups & peripheral vendors: This segment comprises home automation solution vendors who have sprung up especially within the last 3 years. This group focuses on developing a home hub and a few complementary devices most sought out by customers. They leverage partnerships with product specialists to provide a broader range of connected devices. Interoperability is critical to this approach. Startups typically seek to support many technologies in their home hubs to broaden their appeal.

Retailers: Examples of this segment include Lowe's Iris system to control security cameras, light switches, locks and other devices; and office superstore Staples offers a similar system called Connect. These vendors have to compete with the well-known technology brands and their long-term presence in the market will be tested.

Semiconductor vendors: ARM, Intel, Qualcomm and others are active participants in the home automation ecosystem which is a vehicle to drive semiconductor sales. Qualcomm is leading activities at the AllSeen Alliance for interoperability of devices. These companies can make investments into product companies as exemplified by Intel's acquisition of wearable health-tracking device company Basis Science for $100 million in March 2014.

Many types of players constituting the home automation ecosystem leads to a complex channel to reach the end user. System integrators, device manufacturers, connectivity or Internet service providers, home automation system vendors, can reach the end user through a number of channels such as retail, direct, or through a partnership with another member of the ecosystem.

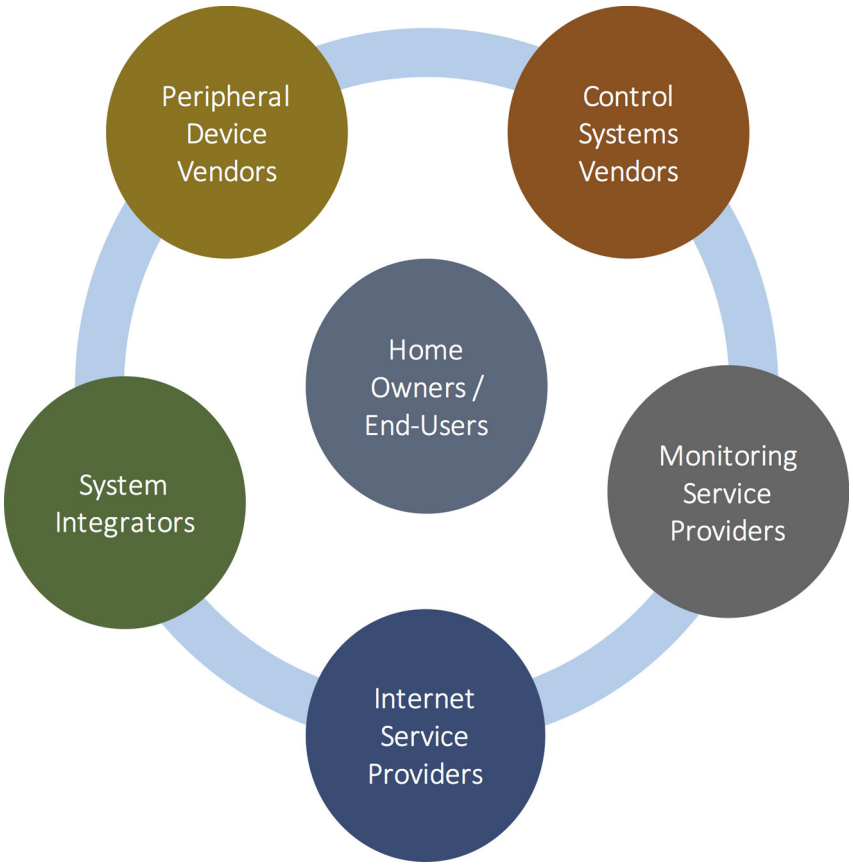

Figure 1: Home automation market value chain.

Emerging Trends

The adoption of wireless technologies for connectivity has shaken up the home automation market unleashing a number of trends:

The race to own the gateway. Home automation devices connect to the Internet through a gateway in the home. A standalone hub, cable set-top boxes, xDSL routers, a tablet may all serve as potential gateways. Established and startup companies are in fierce competition to own the gateway: Insteon (Microsoft), Nexia, Revolv (Google), SmartThings (Samsung), VeraLite, Wink (GE) are a few examples. The gateway owner furthers the chances of its technology platform, increases hold on the user and potentially gains access to a wealth of information on user behavior to derive additional revenues.

Proliferation of technologies. There are many wireless technologies used in home automation including Bluetooth, Wi-Fi, ZigBee, Z-Wave, and proprietary protocols. Technology is related to weighing tradeoffs against application requirements which define parameters such as range, power consumption, reliability, data rate, security, and addressing. Home automation companies are forming alliances and forums to ensure interoperability, improve user experience, and expand market power. This has led to clustering of large industry players jockeying for supremacy in different camps.

Building intelligence. Data science and machine learning techniques could be applied to user data to derive information, such as predicative behavior, leading to differentiated services and new revenues. This multifaceted issue remains nebulous at this stage as it has implications on consumer privacy that many regulators are grappling with.

Heightened competition. Do-It-Yourself (DIY) kits and luxury installations are creating competition across previously separated home automation segments. In parallel Cloud-based services and general-purpose controllers are driving market growth.

Scramble for security. Connectivity of home automation systems to the Cloud expanded the risk of attack and the compromise of privacy. Consequently, solution providers are jockeying to address security and privacy flaws.

Reliance on the Cloud. The Cloud can be used for storage, compute and networking which serves to reduce the cost of user devices and ease the introduction of new services. Leveraging the Cloud requires a framework for management, storage and backup, development of SaaS model, and interface with private and public service providers. Integration of Cloud services is changing the way peripheral devices are built as functions are moved to the Cloud leaving questions on interoperability.

Alliances & partnerships. As industry players converge on this market from different vantage points, they are forming alliances and partnerships to better capitalize on the opportunity, not to mention a heightened phase of M&A activities.

Emergence of application layer standards. The fragmented and siloed nature of home automation applications led to the emergence of application layer standards to allow multiple devices based on different technologies to interoperate and share data in a manner useful to the end user. This is exhibited by efforts undertaken by organizations such as the AllSeen Alliance and Open Interconnect Consortium.

New business models. The extension of capabilities brought about by connectivity and interworking of devices and between devices and the Cloud, is opening new avenues to price services and leading to new alliances. An example is the partnership between thermostat vendors and energy companies to offer rebates on new thermostat for users who exchange power consumption data with the power company.

Additionally, opportunities are brewing for residential IoT partnerships. For example, Pebble, a wearable company focusing on watches, has apps to control the Philips Hue lighting system and the Wink home automation system[3]. Even automotive companies such as Daimler are partnering with Nest Labs[4] – their proof of concept to connect a Mercedes-Benz to a Nest thermostat provides an M2M connection of two consumer products.

The rapid changes in the home automation landscape is forcing companies to change their strategies to adapt to new realities through overhaul of product lines, establishing new partnerships, investing in new markets or making acquisitions, and developing new go-to-market strategies. After Belkin acquired Zensi in 2010[5], Belkin launch their WeMo home automation system two years later at CES, to increase its relevance to consumers, taking the silo/gateway approach.

Market Evolution

Connected-home device shipments are projected to grow at a compound annual rate of 67% over the next five years, much faster than smartphone or tablet device growth, and hit 1.8 billion units shipped in 2019[6]. HVAC and security segments, including devices like connected thermostats and smoke detectors, will become popular first, leading the way to broader consumer adoption. This category makes will make up about 27% of shipments within the broader Internet of Things market in 2019 from about 25% today.

Market revenue is expected to reach over $22.5 billion in 2018 from about $12 billion in 2013 (CAGR of 13.7%). North America (31%), Europe (29%), advanced Asian economies (Japan and Korea), in addition to India and China (15%) are expected to lead the market.

[3] *How to Control Your Smarthome with Your Pebble Smartwatch*

[4] *Mercedes-Benz at the 2014 Consumer Electronics Show: The Future Starts Now*

[5] *MIT Technology Review. 'Home Sensor Startup Snapped Up, April, 2010.*

[6] *November 2014. According to Business Intelligence, connected-home devices include all smart appliances (washers, dryers, refrigerators, etc.), safety and security systems (internet-connected sensors, monitors, cameras, and alarm systems), and energy equipment like smart thermostats and smart lighting.*

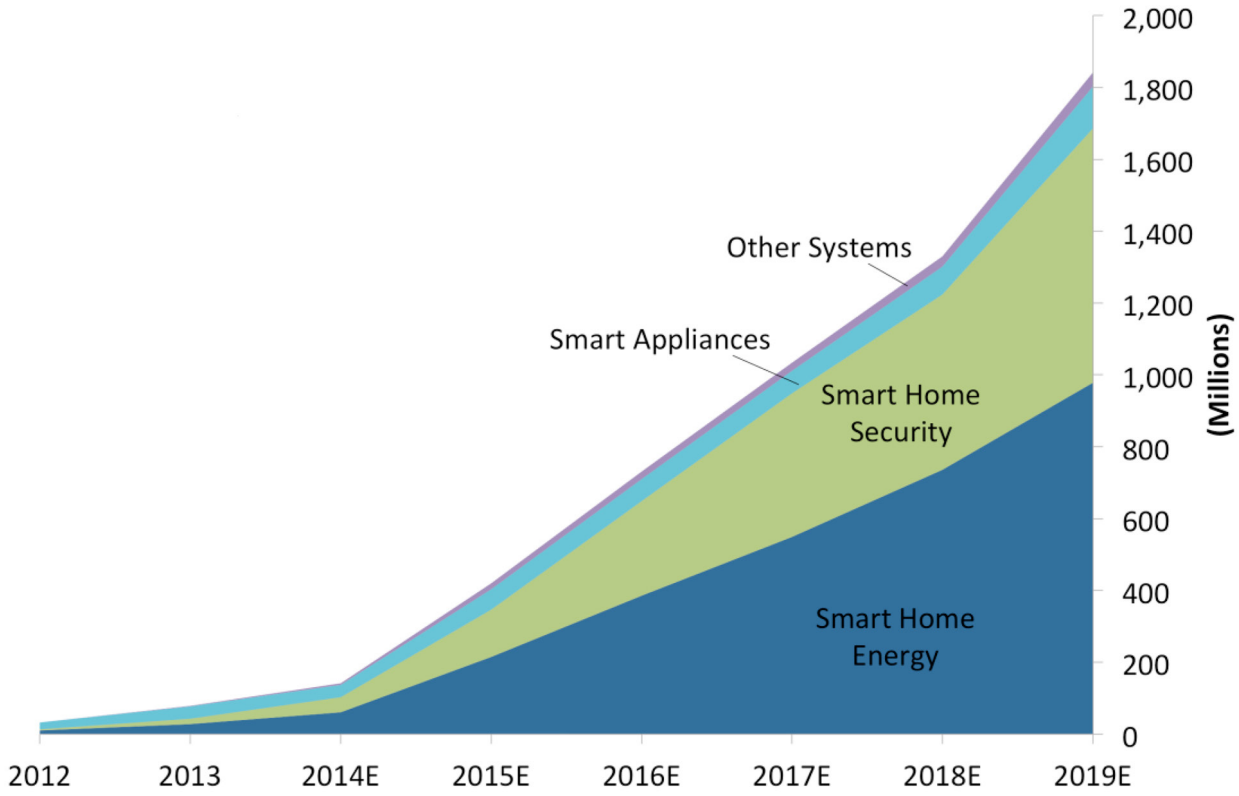

Figure 2: Global connected-home device shipments. [Source: Business Intelligence]

Consumer awareness and interest in connected-home devices is growing significantly. In the US, nearly two-thirds of broadband-equipped households are interested in a connected-home device bundle from their wireless service providers, according to survey data from Parks Associates. Millennials and people who have been in their home for between 3 – 4 years are the most inclined to buy connected-home devices. In each of these demographic groups, 10% of US residents already own a smart home device[7]. American consumers have ranked security as the highest benefit of home automation ahead of convenience and savings[8].

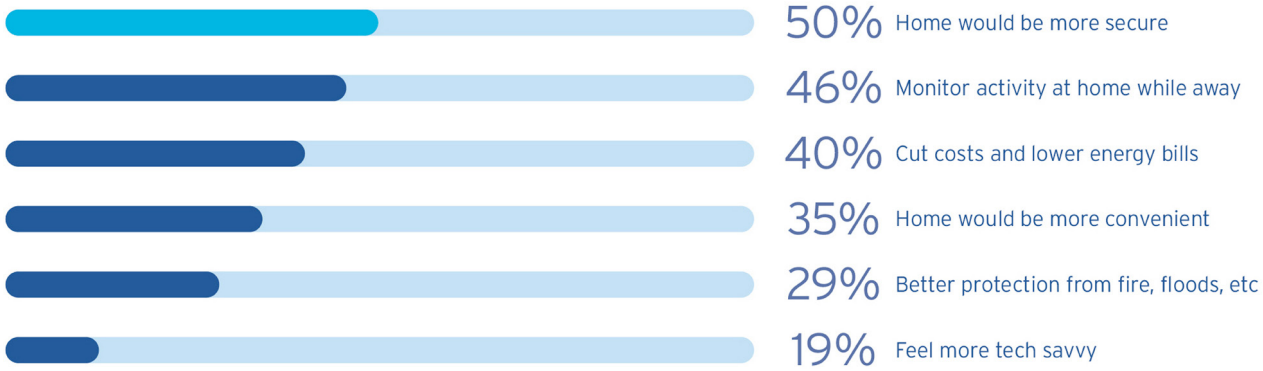

Figure 3: Security is the top benefit for half of Americans. [Source: MaRS Market Insights]

[7] *Business Intelligence. "The Connected-Home Report: Forecasts and growth trends for one of the top 'Internet of Things' markets," March 2015.*

[8] *MaRS Market Insights, "The Connected Home: Smart automation enables home energy management," October, 2014.*

Market growth projections are matched by an increasing rate of investments. Smart home startups took $454 million in investor funding in 2014, an increase of 57% over 2013[9]. Among the largest deals in the space over the past six months include a $38 million Series B from Bessemer Venture Partners, Comcast Ventures and Qualcomm Ventures to August (smart locks) and a $31.8 million Series B to connected home software platform Zonoff from investors including Grotech Ventures and Valhalla Partners.

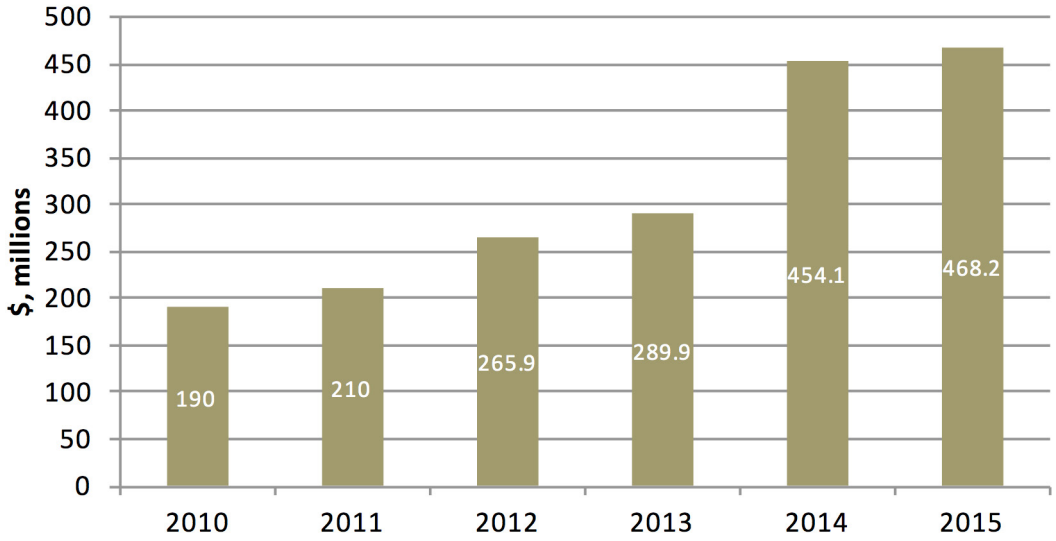

Figure 4: Home automation funding trends.
[Source: CB Insights, Xona Partners Estimates]

The home automation market is an active field for M&As as the boundaries between different ecosystems are blurred in the drive to capture market share with large companies placing early bets through acquisitions. Moreover, some of the lesser known companies have matured their businesses with Control4 and Alarm.com completing successful IPOs in the past two years, in 2013 and 2015, respectively. While both companies took over 10 years to achieve this, these durables goods companies are showing that there is still a massive opportunity to convert consumers.

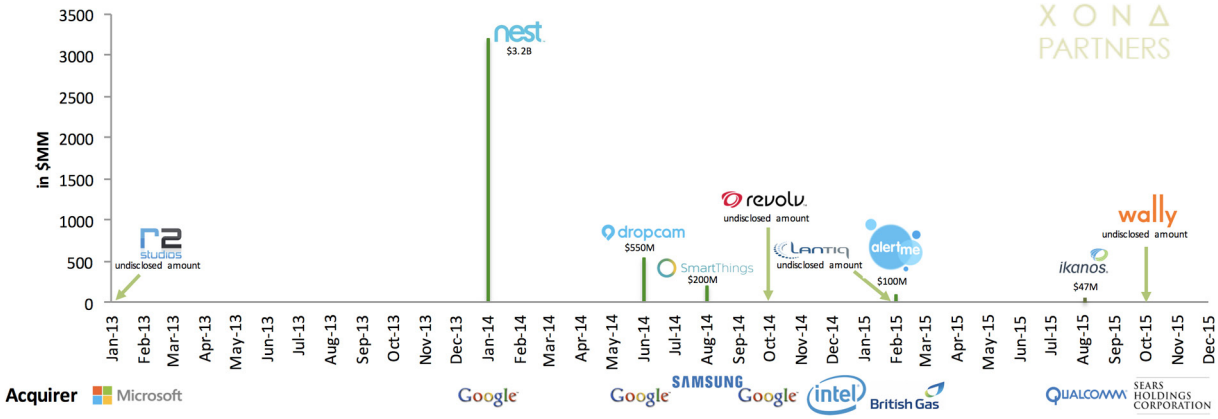

Figure 5: Home Automation Acquisitions 2013 – 2015.

[9] *CB Insights, "Disrupting Honeywell: The Startups Unbundling Honeywell in the Smart Home," April 2015.*

Conclusions

The home automation market is in the midst of a rapid change which began a few years ago at the advent of smartphones and wireless data service. It has since accelerated to breakdown the boundaries of established players as new entrants challenge traditional approaches with new business models, technologies and applications. The ecosystem continues to expand with record high investments and M&A activities. The race to own the home automation market is pursued from different angles by companies in adjacent sectors. The result is an ecosystem at an early stage of formation as alliances are beginning to coalesce to meet the needs of ever more knowledgeable and demanding users. The home automation market will remain a focal point within the greater IoT market space as applications expand as does the pressure to consolidate which will usher a new phase of market development.

Xona Partners (Xona) is a boutique advisory services firm specialized in technology, media and telecommunications. Xona was founded in 2012 by a team of seasoned technologists and startup founders, managing directors in global ventures, and investment advisors. Drawing on its founders' cross-functional expertise, Xona offers a unique multi-disciplinary integrative technology and investment advisory service to private equity and venture funds, technology corporations, as well as regulators and public sector organizations. We help our clients in pre-investment due diligence, post investment life-cycle management, and strategic technology management to develop new sources of revenue. The firm operates out of four regional hubs which include San Francisco, Paris, Dubai, and Singapore.

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