“How to Market the Smart Home:
Focus on Emergent Experience, Not Use Cases”

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January 15, 2016

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Abstract

For smart home adoption to expand beyond the niche segments of technologically sophisticated upscale consumers and technology-focused DIYers, marketers must do a better job of understanding the inherent value the smart home offers. Current marketing approaches are fragmented and focus on individual devices and single use cases. Most companies are wondering which combination of entry points - appliance and home entertainment control, energy management, pet monitoring, property protection, safety and security - make the most sense. But, the mass market is not buying a platform or devices controlled by an algorithm, they are buying an experience. The key to smart home marketing is to view the smart home as a complex dynamic system, an assemblage with new capacities from ongoing interactions among devices and consumers, from which new experiences emerge. Marketers must focus on communicating the value proposition inherent in experience; current approaches may actually be underselling the smart home. We discuss the value of our framework and offer eight actionable insights derived from our research that can guide marketer action in the early stages of adoption and usage of consumer Internet of Things devices that comprise the smart home.
In 1999, an assistant brand manager at Procter & Gamble named Kevin Ashton had the idea that radio-frequency identification (RFID) might be useful in helping to manage P&G’s supply chain. In a PowerPoint presentation, Ashton described how “adding radio-frequency identification and other sensors to everyday objects will create an Internet of Things, and lay the foundations of a new age of machine perception.”¹ Fifteen years later, Ashton’s vision of an industrial system, an Internet of Things (IoT), in which sensors connect physical things to the Internet, is in the midst of widespread, global deployment.² At the same time, the digitization of entire consumer categories including fitness, health care, automobiles and the home itself is now creating the consumer Internet of Things.³ In 2013, Meeker⁴ argued that the new ten year technology cycle would usher in a consumer Internet of Things that will be stronger and faster than previous ten-year technology cycles. This cycle includes wearables (connected body, fitness, health), smart cars, drones, robots, and billions of smart devices, many for the smart home.⁵ While the smart home appears to have arrived, mass adoption has not followed. So how can marketers best communicate the smart home value proposition? It starts with examining what the smart home is.

The Emergence of Something More

The smart home will lead to innumerable changes in the ways that consumers experience everyday objects. These changes will be due, in large part, to the fact that the capacities of everyday objects, and the very identity of what everyday objects mean, will be significantly expanded because of the ways these objects will interact with each other and with consumers. Objects that have had a clear historical identity will become “something more” than they have always been. The door lock, which served to prevent strangers from entering our home when we are away, will now also serve to allow trusted people to enter our home when we are not there. This change in the lock’s identity will necessarily lead to a parallel change in consumer experience. While previously, a consumer’s experience of the lock was one of having a dependable guard that provided a sense of security, consumer experience of a smart lock could, instead, shift to a feeling of working with a trusted partner that enables rather than prevents access.

We believe that such scenarios will be replicated again and again in countless contexts in the smart home. Common household objects, such a toaster, can become active partners in interaction. A smart networked toaster knows that we aren’t using it as much as other households in its network are using their toasters, and the toaster flips its lever angrily to get our attention and encourage us to use it more.⁶
With each new interaction that connects devices and people to each other through the Internet, everyday devices will gain new capacities and our consumer experience of these devices will correspondingly change. Previously unrelated devices, such as a door lock, a security camera, and household light bulbs, will work together, as an *assemblage*, and in the process will be able to do things together that none of these devices could do on their own. The scope of these changes requires a new framework so that marketers can understand not only what these constantly shifting assemblages of smart products will be able to do, but also the implications of their emergent capacities for consumer experience in the smart home.

But before consumers can experience the smart home, they need to adopt the component products.

**Stalled Adoption**

By all accounts, the consumer IoT is expected to be massive. McKinsey Global Institute estimates that by 2025, the IoT could have a total economic impact of more than $11 trillion per year.\(^7\) Cisco CEO John Chambers believes that the IoT represents a profit potential of $19 trillion and calls the IoT the “second generation” of the Internet.\(^8\) Gartner\(^9\) estimates that the IoT will have an installed base of over 25 billion connected “things” by 2020, with 13 billion of those coming from the consumer category. Samsung’s CEO BK Yoon went on record at the 2015 CES show saying every product Samsung makes will be Internet connected by 2020.\(^10\)

Recent consumer innovations suggest that the smart home represents an immense opportunity. Samsung acquired smart home startup SmartThings for a rumored $200 million.\(^11\) Apple’s Watch was released in the spring of 2015 and with Siri, HomeKit and the installed base of Apple TVs and iPhones, provides one of many emerging platforms for smart home development. Amazon’s cloud-based voice assistant, Alexa, is already integrated in a range of third-party IoT devices including home security cameras, automobiles, door locks, thermostats and lights.\(^12\)

Yet, despite the promise and hype, there has been little in the way of actual consumer adoption of the components that comprise the smart home. Industry research suggests that consumer adoption of smart home devices is inevitable,\(^13\) with two thirds of consumers saying they plan to buy at least one smart home device in the next five years. But current adoption rates are low: only 16% of consumers own one device and a mere 4% own two or more;\(^14\) 6% use smart home tech\(^15\) and 4% own one device.\(^16\) Even the most aggressive projections suggest that only 30% are expected to purchase a smart thermostat (one of the most obvious
smart home applications) five years from now, with much lower rates of adoption for other smart home devices.\textsuperscript{17} The 2016 Accenture Digital Consumer Survey reported only a 1\% increase since 2015 in purchase intention for smart watches, fitness monitors and connected home surveillance cameras, and no increase in purchase interest of smart home thermostats in the past year.\textsuperscript{18}

The slow rates of adoption can be traced to three main problems. The first problem is awareness. In 2014, most consumers (87\%) had never heard of the “Internet of Things,”\textsuperscript{19} although the awareness problem is likely to resolve over the next few years, if not sooner, as the mainstream media increasingly covers developments in IoT. The second problem relates to consumer concerns. Smart home device prices are too high to appeal to the mass market and consumers have expressed concerns about security and privacy. Consumers worry that smart devices may develop scary minds of their own (“I’m sorry Dave. I’m afraid I can’t do that.”\textsuperscript{20}) and that they will lose control over their homes.\textsuperscript{21} The third problem is likely the largest. This concerns the issue of value, and it is not clear that lower price points, on their own, can address the value equation. Simply put, most consumers do not see the need for a “smart home,” and marketers have struggled to find the right value proposition to communicate to consumers.

**Cracking the Value Code**

For smart home adoption to expand beyond the niche segments of technologically sophisticated upscale consumers and technology-focused DIYers, marketers must do a better job of understanding the inherent value the smart home offers. Currently, marketing focuses on individual (and expensive) products like smart thermostats and light bulbs, curated “starter kits,” and specific narrow use cases (e.g. turn on the lights when I get home). Mainstream consumers are struggling to find the value in replacing their current light bulbs, switches and monitoring devices with more expensive versions that do not seem to offer much benefit beyond the novelty factor, while likely introducing additional technological complications into their lives. Uncovering the value will take more than is currently being done and will need to involve messaging regarding what the smart home means to consumers. In order for this to happen, marketers need to shift the conversation from use cases to the kinds of consumer experiences that are likely to emerge from consumers’ interactions with the smart home and the potential smart home identities we might expect as usage increases.
Marketing to predefined use cases is highly limiting because it does not focus on how to allow for the unique experience that is likely to emerge for each individual consumer. The user interface of each individual device is not terribly difficult by itself, as it is likely based on controlling the device through a smartphone app or voice interface, but the individual devices require a fair amount of sophistication to work together to satisfy a consumer’s unique needs. A parent who has given their teenage daughter a new car may be more likely to feel apprehension rather than peace of mind when a smart garage door opener marketed as providing “safety and security” turns on the kitchen lights as the daughter’s car drives away. While it is possible to think of how notifications tied to the daughter’s driving behavior might be put together to actually provide real peace of mind, this is unlikely to correspond to a pre-programmed use case, and can present a challenge for a homeowner who is not a sophisticated DIY tinkerer willing to put in some time programming the devices. In effect, the use case approach limits the range of interactions, is inflexible with respect to adding new components and fails to emphasize what experiences can emerge. That is, use cases emphasize what the experience should be rather than what the experience can become. And this problem is further compounded when what “should be” does not happen and consumers end up feeling betrayed.22

One thing that continually arises in our conversations with managers on the front lines is that smart home consumer experience is a variant of Metcalfe’s Law:23 the value the consumer seems to extract from the smart home is related to the square of the number of devices in the home that can interact with each other. A consumer may start off by purchasing one or two smart devices, say a Nest Thermostat and a Philips Hue Light Bulb. The devices are purchased because consumers believe they are likely to perform a single function well. As Brett Worthington of Samsung SmartThings has observed, if those experiences go well, over time, the consumer buys additional devices, for example smart switches, a smart lock, and a hub or relay, and interaction among devices increases. Once the consumer has five or six devices, things start to change. Mike Soucie of Nest Labs has pointed out that while the consumer starts by viewing the devices as separate entities, as the number of smart devices increases, the consumer starts thinking about what would happen if the devices could talk with each other. Importantly, talking with each other is not necessarily something the devices were designed to be able to do. But this capacity for device connection is something consumers want. Industry observations indicate that this effect seems to start at about five to six devices, but, ultimately, this is an empirical question.

What does seem to happen is that the interactions among the devices start to become more important to the consumer than the individual devices themselves.
While the initial monetization opportunity is through the sale of individual smart devices, after a critical base of devices has been installed in a household, the monetization opportunity is going to shift to the value created by the interactions among devices. This suggests that adoption should emphasize how to get consumers started on this path from that first one or two devices, so we can move them to five or six devices where the value proposition starts to make sense. To achieve this, we should focus on marketing the experience, not the use cases.

**Use Cases Are Not Equal to Consumer Experiences**

Let’s examine the online service IFTTT. IFTTT users collectively run 20 million If-This-Then-That “recipes” each day for making various things happen.24 Consider an example of a recipe that makes a LIFX smart LED light bulb turn pastel blue when it is raining. We may view an IFTTT recipe as corresponding to a specific use case that a consumer has identified, for example “change my lights to a nice blue color when it rains.” But what is unclear is what emerges from the interaction of the consumer with this use case. For example, one consumer might find the blue lights vaguely depressing, and modify the recipe so the lights are a warmer yellow color to counteract the depression. Another consumer might find the blue lighting evokes an appealing mood, and to complement this they might further modify the recipe so that mood music plays along with the blue lights when it rains. In both cases, something new has emerged beyond the intent of the original use case. This highlights one problem with marketing use cases as opposed to emergent experience: use cases fail to take into account what might emerge when consumers and other components interact with the use case.

A second problem with focusing solely on use cases is that as consumers develop more and more individual uses cases consumers become overwhelmed by the sheer volume of specific use cases and they become difficult to keep track of. Worse, the general needs underlying the use cases have the potential to be overlooked or obscured. But, it is nonetheless possible to use analytic approaches to infer what has emerged from large numbers of use cases that consumers have created. Our topological data analysis of IFTTT use cases25 found that from use cases corresponding to over 120,000 individual IF-THEN recipes created over a 3 year period from 2011 to 2014, IFTTT emerged as a platform for four distinct types of user experience: collecting and saving, broadcasting and sharing, notifications, and automation. It is important to note that in 2011, IFTTT did not promote use cases for collecting and saving, broadcasting and sharing, notifications, and automation -
in contrast, IFTTT was a blank slate bottom-up platform that allowed these needs, and corresponding consumer experiences, to emerge.

A third problem with focusing on use cases is that use cases assume the user has a clear goal in mind. Mainstream use cases can make the smart home sound vague and boring (i.e. “safety and security”). Third party developers cannot possibly predict everyone’s unique goals with respect to their smart devices in advance. A focus on use cases can easily miss the more idiosyncratic ways consumers are likely to experience the smart home.

In general, then, the problem with a marketing focus that emphasizes use cases, as opposed to experience, is that use cases are not able to anticipate, let alone help us understand or explain the plethora of consumer experiences that can emerge from interactions with the smart home. In that sense, marketing on use cases may very well be underselling the smart home.

From the day-to-day on-going ambient interactions of the various parts of the smart home, the consumer develops the capacity to feel a tangible sense of presence. The interactions of lights, sounds and motion detectors become as real as the physical objects themselves. These interactions can make the consumer feel the home is alive. The consumer might also develop the capacity to feel their home is always with them - that they are “at home” - even when they are away from home. Such a consumer may come to feel, for example, that their house is taking care of them and actually cares about them. Other consumers, through their unique interactions with the home, might come to feel that they are the master of their house and experience their house as a servant that exists to do their bidding.

Thus, instead of thinking our home is smart because devices are marketed as part of the “smart home,” the home proves itself to be smart through its interactions. Such feelings and experiences are emergent and the result of the multitude of interactions, more than any individual interaction with any single smart device. Viewing consumer experience as the response that emerges from the interactions among the capacities of both the smart home and the consumer suggest the benefit of a framework that explicitly incorporates the idea of these interactions.

Right now, managers tell us that they are struggling to tell the story to the consumer about how these devices can add value. Obviously, figuring out the “value story” will help stimulate adoption. So, moving the focus away from fragmented marketing focused on individual devices and single use cases toward emergent experience might be useful. But managers are asking, can we predict what this experience will
look like? This is a good question. Fortunately, we believe our research provides an analysis path.

**An Assemblage Theory Framework for the Smart Home**

Consumer experience in the smart home involves nonlinear, nonsocial interactions in complex nested, overlapping and constantly evolving networks that connect heterogeneous entities in the digital world with equally heterogeneous entities in the physical world. In our research we have built on the concept of an *assemblage* to capture the essence of this complex system and derive insights about how to market the smart home.

An assemblage is an emergent entity with new capacities that derive from the ongoing interactions of its heterogeneous component parts. Interaction always operates through paired capacities of components, where the capacity of one component to affect is always paired with the capacity of another component to be affected. So, interaction is directional. For example, if the consumer triggers a beacon when she enters the kitchen, then the smart home hub will turn on the overhead light; or if a leak detector is triggered by a broken pipe, then the smart home hub will send the consumer a text. Importantly, these paired capacities can involve device-to-device interactions: if a motion sensor detects activity, then the security camera will start recording.

The smart home experience emerges from all the paired capacities that are exercised across all of the ongoing interactions of the consumer and the smart home. It derives from both the consumer’s capacities and the smart home’s capacities. Most important, the experience that emerges is more than what the individual devices themselves provide. That is, these interactions create a whole - an assemblage - that is more than the sum of the parts.

What are the benefits of our framework? Rather than focusing on siloed device-oriented experiences, our approach focuses explicit attention on the experience that emerges from the entire smart home assemblage. In our view, the smart home has the capacity to learn its inhabitants’ behaviors and routines, and satisfy their needs. Because it is simply not possible for any programmer to figure out all the use cases a consumer is likely to want to experience, this approach means the smart home actually has the opportunity to be smart, learning about its occupants.

Some of the most exciting experiences may emerge from device-to-device interactions. Curt Schacker, of EVRYTHNG IoT Smart Products Platform, gives the example of food that could let your refrigerator know its expiration date and if the
food, refrigerator and your calendar are connected, the refrigerator could let you know that you need to eat the eggs and drink the milk this week before you go on your trip because if you don’t, by the time you come back, the milk and eggs will be spoiled. We think this is a powerful vision that can give us a way to analyze and provide insight into what sorts of experiences are likely to emerge from interactions among paired capacities of smart home components and consumers.

**Eight Important Insights**

Marketers face the immediate concern of uncovering the value proposition that will help the smart home expand beyond the niches of upscale consumers and technologically sophisticated DIYers to the mainstream mass market. Most companies are chasing use cases and wondering which combination of entry points - appliance and home entertainment control, energy management, pet monitoring, property protection, safety and security - make the most sense. But, as we have argued, the mass market is not buying a platform or devices controlled by an algorithm, they are *buying an experience*. Here we offer eight insights derived from our research that can guide marketer action in the early stages of adoption and usage.

1. **Market From Bottom Up Interactions, Not Just the Top Down.** The smart home will evolve from all the bottom-up interactions that are developed by individual consumers for their unique situations, not from a small set of five or six top-down use cases. Saying there are five uses cases for the smart home is like saying there are five uses for the Internet. A bottom-up approach that configures smart home starter kits and devices in such a way that consumers can figure out for themselves how best to use them means that individual use cases can emerge, from the bottom-up, rather than being dictated from the top down by marketers. Such consumer-driven coding of the smart home provides its meaning and reinforces its identity. This coding occurs through rules that are by definition bottom-up processes that individual consumers develop for their own unique situations.

   From a communications perspective, smart home marketing needs to expand beyond use cases and focus instead on interaction. We can’t assume that consumers will experience a feeling of “safety and security” just because we tell them the components in the box represent that experience. Instead, we need to ask, in what ways will consumers and devices interact with each other inside of a given home to create the experience of feeling safe and secure?
The challenge in implementing a bottom-up approach comes down to finding the right balance between ease of use and rule complexity to permit experience to emerge. IFTTT, for example, is easy to learn and use, and while it can connect hundreds of different devices and online applications with each other, the individual rules are simple and straightforward if-then combinations. SmartThings’ Rule Machine, on the other hand, is a generalized rule engine for the SmartThings platform that lets the user define powerful logical expressions that can link sub-rules using AND and OR operators; the tradeoff is considerably greater difficulty of use, especially for the novice consumer. Alternative approaches have the smart home help the user create rules. For example, Webee’s “smart learning spaces” learn about the user’s daily activity, and suggest rules that might be useful for that person based upon their daily choices. Similarly, the Huevolution smartphone app for Philips Hue smart lighting “learns your habits and adjusts the environment to meet your needs.” What all of these approaches share in common is a focus on the interaction among devices and people that allows experience to emerge, but much more needs to be done to make the focus on interaction a key aspect of the marketing message for the smart home.

2. Fill ‘er Up vs. What Can I Do With a Full Tank? We can contrast where the smart home is now, compared to where it can go. Imagine a gas station on the open road. The use case is akin to a gas station which lets you fill up an empty tank. But the experience is focused on what becomes possible with a full tank of gas. Once we can clearly see and understand what is happening in the home, where can we go next?

Current marketing efforts highlight consumers using apps, or more recently, voice, to execute smart home functions, but the functions, e.g. a consumer controlling a light switch through a command and control use case on an app, are not what will define the smart home identity. In order for smart home identity to emerge, consumers need to be able to access and understand all the different interactions the smart home is capable of. This experience-based focus is critical because, as we have noted, many of these interactions are device-to-device and do not even directly involve people.

One way to facilitate this understanding is to give consumers the tools to visualize these interactions. But current apps present the smart home not in terms of interactions, but in terms of individual use cases and devices. This obscures the interactive nature of the smart home and limits its ability to impact experience. Even dashboards, when they are offered, are very device-focused and do not currently surface the interactions in the home. The dashboard may show who is at
home or what devices have been used, for example, but not how people are interacting with devices, and not how devices are interacting with each other. Instead of merely reporting current conditions, dashboard visualizations need to surface information on interactions, rather than devices, to provide guidance on the direction the home is headed.

3. “Everything You Already Understand, But More.” The iPad wasn't sold on the basis of use cases. As Ritchie\textsuperscript{31} reminds us, Steve Jobs emphasized the “magical” and “revolutionary” qualities of the iPad, even as people mocked the name and seemed confused about how to categorize it (giant iPhone? iPod Touch? Kindle?). Apple marketed the iPad as something new, something you could use for "browsing the web, reading and sending email, enjoying photos, watching videos, listening to music, playing games, reading e-books and more." It was marketed as “everything you already understand, but more.” It wasn’t limited to existing uses, but hinted at novel uses, if only you were willing to adopt one and give it a try. This opened the door to buying an iPad for lots of different reasons and applications and as substitutes for everything from an e-reader to a gaming device to a TV.

It was not clear at the outset what the iPad would be good for. It had a lot of capacities, but there was little consensus on how they might be exercised. Early reviews emphasized ease of use and a better computing experience and compared the device to existing categories like laptops or netbooks. But it was also emphasized that the device appeared to represent a new category - even if no one could really say what it was. People did not really know what an iPad was when it first came out. But it started to become clearer with regular use.

The smart home use cases are like those initial iPad categories of use. Consumers doubt the value of the smart home and don’t really understand what it means. Yet, marketing efforts seem focused on telling consumers, buy this smart home device and what you are really buying is a bit more comfort, instead of letting consumers experience for themselves which interactions do - and do not - lead to the emergence of an experience of comfort.

4. Encourage Habitual Repetition. Habitual repetition involves performing routine behaviors over and over again until they become habits. When heterogeneous components - lights, thermostats, apps, appliances and people - interact over time in a predictable way, assemblage theory predicts that the behavior resulting from the habitual repetition will increase the homogeneity of the smart home assemblage, which in turn will stabilize its identity.\textsuperscript{32} As examples,
every time you leave the house, your Nest thermostat knows you’re gone and lowers the temperature to 68 degrees. Every time your wash is done, your washing machine texts you. Every time you run out of Tide laundry detergent, you press your WiFi connected Amazon Dash Button to reorder. It is important to note that these routine interaction behaviors do not necessarily need to directly involve the consumer, since many smart device interactions are autonomous, once they have been programmed. For example, lights that are programmed to go on at sunset and off at midnight specify a routine that operates without direct participation of the homeowner. Together, these heterogeneous components create a stable and homogeneous stream of interactions.

The importance of these constant interactions to the identity of the smart home cannot be overstated, since it is the interactions - and not the components - that comprise the very fabric from which the experience of the smart home emerges. Without these ongoing interactions, there is no smart home, just a collection of individual devices. Marketers obviously need to stimulate purchase of smart home devices, but the focus should be on usage, encouraging regular interactions among those devices as quickly as possible. A necessary condition for usage is interoperability. It is important to note that smart home device owners consider interoperability among devices to be very important, and even more so with each device purchased.

5. Focus On Ambient Interactions to Build Trust and Connection. Ongoing routine interactions stabilize the identity of the smart home, but it is important to recognize that these interactions do not have to involve people. And even when they do involve people, these interactions will be largely ambient. Although marketers might be thinking mostly in terms of consumers directly interacting with devices in the smart home, the ongoing background, or ambient, interactions are probably more important contributors to defining the smart home. One reason for this is because ambient interactions are likely to build trust in the smart home, in the same way that they build trust in interpersonal relationships. Routine interactions, happening again and again in the background, not only shape consumer experience, but lead to confidence that the house can be relied upon to do what it is programmed to do. We think a strong argument can be made for marketing add-ons (e.g. notifications of ambient interactions) that will help build confidence in consumers’ minds that the smart home is executing as it should be.

Routine ambient interactions also can lead to a feeling of connection of the consumer with the smart home. Ambient intimacy describes the feeling of intimate connection that can result from a sequence of on-going low level interactions among
people, for example by the constant exchange of brief text messages. In the smart home, ambient intimacy may be achieved by the regular, low-level interactions that people have with smart devices, or by people observing how devices interact with each other. The experience of feeling closely connected to one’s home, or of a deeper sense of place, goes well beyond the concept of a use case and only emerges from ongoing, largely ambient, interactions.

6. Routines Also Need to Be De-Stabilized. Even as marketers strive to enable stabilization of the identity of the smart home in the early adoption phase by encouraging habitual repetition, they must simultaneously be focused on how to destabilize the smart home assemblage to some extent in order to encourage deeper adoption and usage. Interaction with the components of the smart home assemblage must become routine; but to keep consumers from encountering the natural tendency to get bored as they gain experience interacting with smart devices, marketers must expand the boundaries of what the house can do with consumers and what consumers can do with the house. So, marketers must consider how to give consumers a gentle push, e.g. with new capacities of existing products, new rule engines, new products, and so on, if they want consumers to move beyond single devices and starter kits.

It may seem like our advice is contradictory. Yes, it is important that device interactions become routine, because that helps to stabilize the identity of the smart home. As consumers get into the habit of incorporating these devices into their daily interactions in the home and letting them run in predictable ways, this habitual repetition will help stabilize smart home identity. At the same time, marketer-led destabilization efforts serve as a push to move consumers beyond single devices and starter kits, and beyond what might be an initial, limited identity of the smart home based upon fairly rudimentary types of interactions.

7. Pay Attention to Emergent Individual Smart Home Identities. It should be evident that marketers want to foster consumer trust in the smart home, but why should they care about smart home identity? In addition to viewing an assemblage as an emergent entity characterized by its interacting components, assemblage theory posits that a given assemblage is a singular realization from an underlying, structured topological possibility space that influences the trajectories by which assemblages form over time. Actual instances of smart homes that have been assembled are observed singular realizations in the possibility space. Over time, a population of smart homes will emerge through recurrent processes - underlying forces that drive smart home assemblages into a relatively small number of optimal
locations in the possibility space that share certain characteristics. In other words, our assemblage theory framework predicts that many different individual homes will all wind up at the same place, even though they may have taken very different paths to get there. Marketers will immediately recognize that these optimal locations represent emergent market segments.

With a population of smart homes, marketers can begin to gather empirical evidence, for example through techniques like topological data analysis, as to what the optimal locations look like. As consumers interact with the smart home, an individualized identity of the smart home will begin to emerge, but homes will “clump” according to the similar meanings and characteristics they share. In other words, marketers are not just interested in any one particular smart home, but in segments of smart homes. It is important for marketers to pay attention to these segments, because they provide important clues to the important commonalities and general meanings of smart home identity. Smart home data streams of component interaction data over time from individual smart home assemblages will provide the raw material for inferring segments of smart homes that behave in similar ways. This may be contrasted with the current practice of the a priori segmentation of smart homes based on use cases. Thus, the process of market segmentation also proceeds bottom up, rather than top down.

So, rather than assuming what the market segments are, marketers should be observing closely to see what segments emerge. In addition, as macro assemblages, that is, higher level assemblages comprised of networks of individual homes, emerge from (lower-level) smart home assemblages, these collections of assemblages at different levels give insight into market segmentation and market structure.

8. Personalization Will Trump Privacy. We believe identities for the smart home have the potential to emerge that are likely to outweigh privacy concerns. The shape of these identities may give some insight into what features consumers value enough to trade off some aspects of their privacy for. That is, we believe that “something more” will emerge which will be more valuable for people to experience in their homes than their concerns about privacy. We think these identities will likely include personalization efforts. As smart home assemblages, largely through habitual repetition, come to know more and more about the inhabitants in these homes, the potential benefits from personalization could very likely trump privacy.

Consumers find personalization appealing. Early evidence from the smart home marketing trenches suggests that consumers want their smart devices to learn what
they are doing so they can benefit from it. Personalization involves the devices identifying consumers uniquely, gathering data about their interactions to create individualized profiles and then applying that information to subsequent interactions. Voice is likely to be a big part of personalization since devices can learn to recognize our voices and uniquely identify us.

Since smart home assemblages can interact with each other, and with other assemblages, new experiences will also emerge from these macro assemblages interacting with each other. Take, for example, a group of families in a neighborhood who connect their homes on a network so they can keep a better eye on their kids and pets - where they are playing, notifying them when it is time to come home from the playground for dinner, and so on. Will the consumers in these homes be willing to give up aspects of their privacy for the greater value derived from being networked? We think they might.

The Challenge for Marketers

In the same way that the Internet expanded interaction among people from one-to-one and one-to-many to many-to-many interaction, with profound implications for communication and social interaction, the smart home expands interaction between people and products to include much more complex interactions between people and products and newly possible interactions among products. While this may seem like a natural progression, we believe that the implications of these interactions for consumer experience - especially when they occur with the everyday objects and devices typically found inside people’s homes - will be nothing short of revolutionary.

At its most basic, new marketing approaches should emphasize the assemblages from which experiences emerge, not the individual devices or use cases. Use cases focus only on parts of the smart home, and the smart home is going to be much more than the sum of its parts. The smart home - like any disruptive technology (smartphones, iPads and virtual reality) - is emergent. Its identity will emerge over time. We need tools to understand how the smart home’s identity - and consumer experience of the smart home - will emerge. We need a new vocabulary for understanding the emergence of smart home identity and experience, and the consumer IoT, more generally. The best way to develop this vocabulary is to focus on adoption and get these devices into as many homes as possible as quickly as possible so consumers can start interacting with these components and the singular realizations in consumer experience can emerge. From these identities and
experiences, the optimal locations will be revealed and a new vocabulary will emerge.

The challenge for marketers will be to connect the constantly moving dots. Predictions are difficult, but just as the Internet revolution that began nearly a generation ago brought staggering change to nearly every aspect of human life, we believe the smart home represents another wave of change that is likely to be astonishing, awe-inspiring and frightening, perhaps all at once. As events unfolds, the insights we have been able to derive thus far from our research may help managers as they struggle to understand the strategic marketing implications of the consumer IoT. The first step is to think carefully about not only the immediate challenges involved in fostering early adoption, but on developing the mass market and encouraging habitual use to encourage retention. We hope these ideas help.
Endnotes


5 At the time of this writing, the major categories of smart home connected devices includes, but it is by no means limited to connected audio and media streaming (Apple TV, Amazon Fire, Roku), connected smart TVs (e.g. Samsung), wearables (Apple Watch, Fitbit), thermostats and smoke detectors (Nest, Honeywell Lyric), lights, switches and receptacles (Philips Hue, Belkin Wemo, Insteon), locks and door openers (Chamberlain MyQ, Kwikset Kevo, Schlage Sense, Lockitron Bolt), air conditioners (Quirky+GE Aros), hubs (Iris, Insteon, Smart Things, WeBee), large home appliances (LG ThinQ, Samsung Family Hub Refrigerator, Bosch Home Connect), small home appliances (Belkin Crock-Pot, Withings Smart Scale), home gardening (Opoom Farm Cube), pet monitoring (WUF, Whistle, Garmin Astra), food monitoring (Quirky Egg Minder), baby monitoring (Mimo Baby Onesi, Owlet Smart Sock Baby Monitor, Safe to Sleep Breathing Monitor Mat), gaming (Razer Smartband), water monitoring (WallyHome), humidity monitoring (Leviton humidity sensor), cameras (Dropcam, goPro, Samsung SmartCam), mattresses (Sleep Number C2), clothing (e.g. Athos, Under Armour, Microsoft), storage (MakeSpace), and cars (Uber, Dash, Audi, Ford, Mercedes).


14 Gartner, "Gartner Says 4.9 Billion Connected "Things" Will Be in Use in 2015; In 2020, 25 Billion Connected "Things" Will Be in Use"
15 Nielsen, "Innovation Trend Watch: How "Smart Products” Can Win over the Mainstream Consumer"
16 Acquity Group, "Acquity Group 2014 Internet of Things Study"
17 Ibid.
19 Acquity Group, "Acquity Group 2014 Internet of Things Study"
20 The HAL 9000 responding to Dave Bowman in a scene from the movie “2001: A Space Odyssey” 1968.