

WHITE PAPER

Product Innovation in the Age of the Connected Home

by **Kurt Rampton**



The age of the smart home is upon us. Sure, it's been a slow, messy, sometimes glitchy rollout. But in the last several years, connected home products with smart features, like remote control from your smartphone or the ability to learn and adapt to your behavior, have finally started to deliver on their promise. Consumers are now reporting more satisfaction with smart home products than similar non-smart options, according to the **2016 U.S. Houzz Smart Home Trends Study**. And that's creating rapid growth in the smart home product sector.

According to a **2015 report by Verisk Analytics**, "Internet of Things" devices (largely consisting of smart home products)

will outnumber PCs, tablets, and smartphones by 2018. The report forecasts that the 4-5% of North American households with connected-home products in 2015 will grow to nearly 16% by 2017. And North Americans will have 13 connected devices per home by 2019, **predicts IHS Markit**.

Whether they know it or not, most homeowners already have a smart home control system in their home. The biggest trend in smart home control is the proliferation of "listening devices," and you probably already have one. Smartphones, tablets, smart watches, and more recently, smart speakers like Amazon Echo and Google Home are all set up to control the next generation of smart devices. As homeowners

continue to integrate these devices into their lifestyles, they'll look for ways to expand their smart home ecosystem.

For manufacturers, simply spicing up your spec sheet with smart features isn't going to catapult your product into the open arms of waiting consumers. It's worthwhile to take stock of the industry's successes and failures, to find out how smart products are winning their way into hearts and homes. What follows are 6 important lessons for product innovators hoping to succeed in the age of the connected home.

1. Consumers are going to approach smart home products in a modular way. Many manufacturers over the years have tried to build their own "walled garden" of connected products—a menu of smart devices, usually communicating through a central hub, only compatible with certified products. No one system has been able to connect with consumers in a broad way. And that's because it's asking too much of consumers to research and compare technology platforms, choose the brand that is best for you (one you hope won't go out of business), and buy-in. Most consumers today aren't looking to jump into the deep end on a completely automated, comprehensive smart home experience anyway. Instead, they are much more likely to add smart products a la carte to their home. Nik Fedele, President of Refresh Technologies, put it this way,

"Consumers are going to approach this stuff in a modular way. They might start with a Nest thermostat, and later add a few Wemo light switches. They'll build up their smart home over time, not all at once."

If you want your product to be installed next, make sure it plugs effortlessly into the homeowner's life. It needs to communicate over the network the homeowner already has (Wi-Fi), and work seamlessly with a diverse ecosystem of smart products they own or hope to own.

Smart products are inevitably gathering troves of private data about you and your family, so you need some confidence that the brand will handle your information carefully and with discretion.



This display for TiO, seen at this year's NAHB International Builder Show, illustrates the type of complex system that smart hub manufacturers hope consumers will adopt.

2. In order to go mainstream, **smart home products must overcome some traditional barriers to purchase—complexity, interoperability, and privacy / security.**

A. Let's face it: a toaster that I can control with my smartphone sounds needlessly **complex**. It's hard to imagine most consumers going through the trouble of pairing their simple appliances to their smartphone for a gimmicky benefit. But what if a smart product was actually easier to install and operate than its not-smart counterpart? That, in fact, is the case with new smart home security systems like Canary. These security products don't require wiring, so they are easier to install than traditional security systems. And users can start off with a couple of components and then expand the system. Simple installation is one reason half of all **homeowners upgrading their security in 2016** installed security products with smart features.

B. **Interoperability** is a fancy way to say, "will this product work with my other devices?" It's no surprise that consumers are overwhelmed by the vast and segregated smart home marketplace. Just utter the words ZigBee, Z-Wave, or Bluetooth Low Energy (BLE) and watch their eyes glaze over. But these proprietary smart-home network communications protocols are slowly getting marginalized by an old standby, the home Wi-Fi network. And it makes sense—**most homes in the US already have a Wi-Fi network**. Consumers don't have to own a hub to get started with smart products like the Nest Thermostat, Ring Video Doorbell, or Canary Security systems. Digital Trends' **5 tech trends that will change the world in 2017** predicts the "Death of the Hub" as more products will use a home's existing Wi-Fi network to maximize compatibility.

C. Consumers have a couple more reasons to give pause before festooning their house with connected products: **privacy and security**. Smart products are inevitably gathering troves of private data about you and your family, so you need some confidence that the brand will handle your information carefully and with discretion. And then there are the security concerns—can someone hack into my smart devices and spy on my family? Steal my credit card information? Or coordinate a robot attack? It sounds silly, but it's not that far from reality. In **October 2016**, hackers compromised a vast swath of connected Internet of Things devices around the world, using them to attack the DNS systems that form the backbone of the Internet. These concerns have not been solved and are sure to present a headwind for the industry in the coming years. But they are being addressed by today's major brands of smart products. Apple vets every device for security on its HomeKit network and employs end-to-end data encryption. Nest claims a commitment never to sell

the data they gather on you. In a nod to those concerned about hackers listening in, Google includes only one physical button on their new Home device—MUTE—for privacy.

And there may be another way to soothe customer's security and privacy concerns—make your products worth it. In their **Smart Home, Seamless Life** survey, PWC concluded that "security around one's data is a concern, but often overlooked when the value of a product is proven."



At this year's Kitchen and Bath Industry Show, many new smart home fixtures were on display, including (clockwise from top left): LG Puricare Smart Air Purifier, Athena Smart Faucet by Huayi, Numi Intelligent Toilet by Kohler

Smart home products succeed when they simplify our lives, not complicate them, and that includes the aesthetics of our home.

3. The growth of listening devices will drive adoption of all sorts of other smart products in the home. Amazon Echo, a “smart speaker” with a voice assistant named Alexa, has captivated consumers since its launch in late 2014. Homeowners can ask Alexa to play a song, read the news, or answer questions. And you can ask Alexa to control your other smart home devices. Smart speakers, like the Amazon Echo and Google Home, are part of a **fast-growing sector** of smart products with voice control technology, known in the smart home world as “listening devices.” They may just be displacing the “hub” at the center of your future smart home ecosystem. Even big-box home retailers like Lowe’s are expanding their smart home departments as **they expect a larger percentage of households to adopt smart speakers.** “Listening device” was also **the buzzword at this year’s Kitchen & Bath Industry Show in Orlando**, where BOLTGROUP designers saw a variety of major brands of appliances and fixtures demonstrating new products controlled with Amazon Echo and other smart speakers.

Listening devices become much more powerful when they can control a broad ecosystem of smart products (not just your thermostat). With a single voice command such as “let’s get ready for bed,” Alexa can dim the lights, turn off the TV, lock the doors, put on some ambient music, and lower the thermostat two degrees. That is, if your TV, switches, door locks, speakers, and thermostat are smart. So, expect consumers to seek out smart gadgets in more and more categories of home products, as they look to do more with their listening devices. It’s practically mandatory for new smart products to take advantage of the most popular listening languages including AVS (Amazon Voice Service), Google Assistant, and IFTTT. More than 7,000 brands have **already integrated AVS into their products**, and major appliance brands like Whirlpool, LG and GE have all **announced** a broad range of smart products natively compatible with voice control technologies like Alexa for 2017.

Amazon is betting that its success with Alexa will drive adoption of new services as well. They recently announced

Prime Now, which gives consumers free 2-hour delivery when they order certain products through Alexa. (So we can **finally ask Alexa to “bring me a beer”!**) And it won’t be long before your refrigerator can sense when food is spoiling, and order milk or eggs when you are low (through a partner grocer, no doubt). Look for manufacturers to incorporate more smart services into their smart products in the coming years.

4. Smart products should communicate with the consumer in useful ways (without being annoying). Good smart products are not simply automation devices. They are also communication devices. At BOLTGROUP, we frequently conduct in-home ethnography as part of our design research process. In our conversations with consumers talking about automated products, we often hear the phrase “I want to know.” They don’t want their products to simply vacuum the house when it’s dusty, and clean the air when it’s contaminated. They want to know it’s happening and why.

When consumers can link their smart security camera to their smartphone, they get useful notifications like when a package has arrived, when their children get home, and when the batteries are low. But there is a balance. Once you abuse the privilege of a more intimate relationship with your customer, they will turn you off. **Google Home recently drew unwelcome attention** when owners reported hearing an ad for the film Beauty and the Beast while using their Google Home smart speaker.

5. The product must be beautiful, now more than ever. In **Smart Home Trends that Will Dominate in 2017**, Engadget’s Anna Johansson predicted a stronger focus on aesthetics in future smart home products, “The thing about smart home technology is that it can’t just perform well, it also has to look the part. People are very particular about their home’s design and don’t want elements that look out of place.” Smart home products succeed when they simplify our lives, not complicate them, and that includes the aesthetics of our home. Look for simple, elegant, and striking product designs with luxury materials and customizable features to rise above a marketplace saturated with too much plastic, chrome, and blinking LEDs.

6. Smart products, and smart businesses, learn and adapt. The Nest Learning Thermostat saves you money on your energy bill by learning when you and your family are home and adjusting the climate automatically. But that’s not the only way it learns. Nest is continuously working to improve their software and algorithms, and expand interoperability on their thermostat products. And because their products are “connected,” every Nest gets an upgrade, not just the latest model. In this way, smart products are able to grow



Virginia Tech's FutureHaus is a prototype for a manufactured smart home, showing off a wide variety of automated and intelligent features. Seen at this year's NAHB International Builder Show.

and improve their functionality, long after initial purchase. With the proliferation of smartphones and software updates, consumers are now expecting their smart products to get better over time.

Makers of smart products also face a massive learning opportunity—the vast troves of data gathered by their products. “Data collection is a big motivation to get into smart products,” Nik Fedele told us. “Do you think Google is making a profit selling Home at \$130? Do you think they made a profit giving away Gmail for free?” The implication is that consumer data is so valuable, some brands may be selling smart products at a loss, or giving them away, to get their hands on it.

Few businesses can match Google's capacity to gather, process, store, and analyze data. But every business must seek to learn from their customers in order to make their products better. And smart products, with their array of sensors and network of connected components throughout the home, offer an opportunity to gather valuable insights about the way people use products in the context of their lives. ■



MEET KURT

Kurt Rampton has been with BOLTGROUP since 2010 as a Senior Industrial Designer on the Product Innovation team. He was born to design and flourishes in a career that combines art and fashion with physics and geometry. He's a recipient of the IDSA Student Merit Award during his tenure at Georgia Tech.