matter

# Can Matter finally crack the smart home?

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Can Matter bring greater security and reliable connectivity to the smart home?

As someone who has been involved in various efforts and standards around the smart home since 2005, every year we seem to ask when the Smart Home will hit more mainstream. I have written articles over the years on my list of impediments to the smart home – cost, ease of use, interoperability, security and future proofing. Let's review the current state of the smart home and how Matter may finally impact its growth and consumer acceptance.

Current state of Smart Home Market

Over the past few months, many groups have released their latest smart home analyst reports or updates. Parks Associates released this graph, which summarizes where the smart home is today.
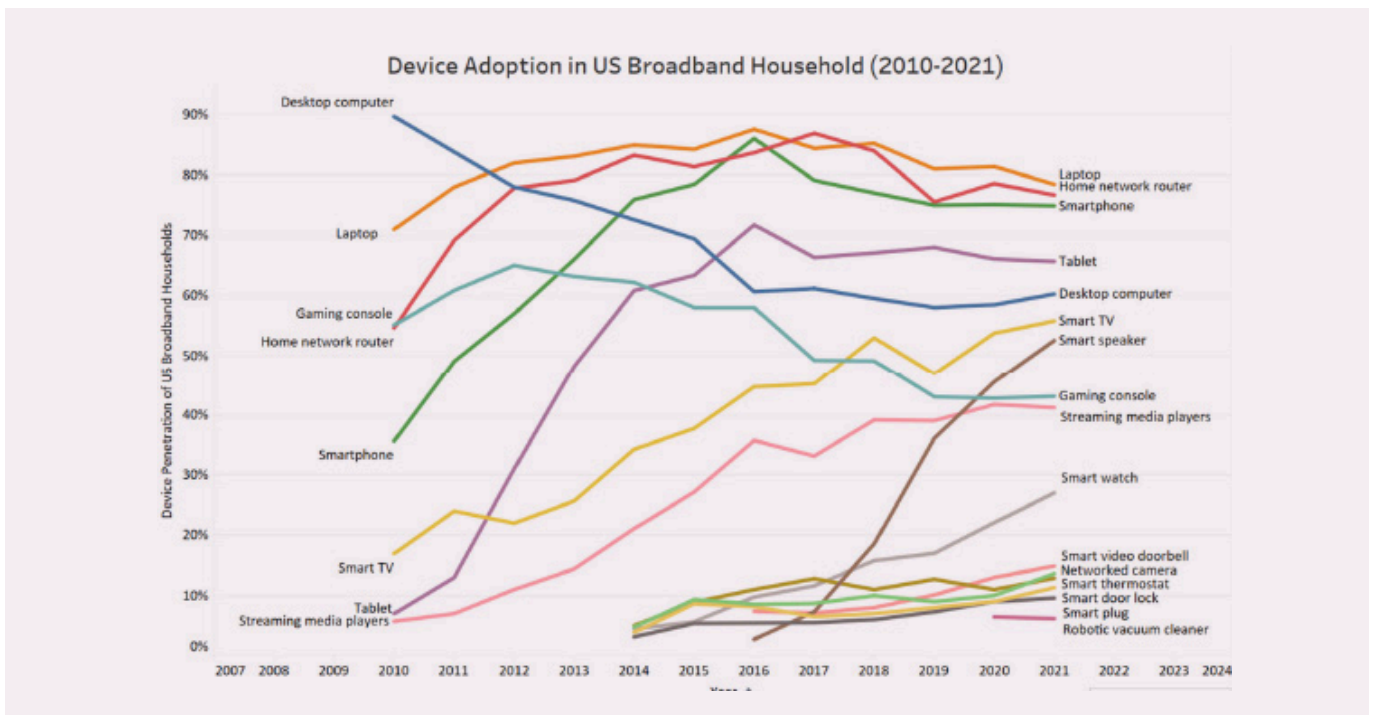
Source: Parks Associates 10-year view published April 4, 2022

When smart speakers hit the home in 2015, we had a magical new device that we could interact with and would allow us to control devices in our home. My house added more smart lights and door locks, and voice control made it simpler for my family. As the graph shows, smart speakers grew very rapidly and now are in more than 50% of homes with broadband access. These smart speakers are dominated by Amazon, Apple and Google.

What the graph also shows is the lack of rapid uptick of other devices in the home. If we lump video doorbells and video cameras together, they reached a respectable 30% of broadband homes. However; our door locks, thermostats and smart plugs are not seeing rapid adoption. Note lighting is not shown on this graph, but other industry data shows it lighting is similar to the door locks and thermostats in terms of number of homes (while higher in absolute devices since homes have many lights).

In six years, smart speakers have grown to over half of broadband homes, but after 15 years the smart home devices have not seen that kind of consumer acceptance. Safe to say the overall smart home experience has not entered mainstream. Security systems are the closest to mainstream. Parks reports up to 36% of broadband homes have a security system, either professionally installed and monitored or DIY. However, many of these security systems are proprietary and do not support broader integration across the home.

The ABI report on Matter and Its Smart Home Impact does a good job of describing the past 10 years in the smart home:

› Vendors trying to carve out and protect their installed base
› Limited interoperability between ecosystems
› Confusion by consumers on what devices to buy and if a given device will operate in their ecosystem
› Higher costs on device makers as they make duplicate products for different ecosystem

Growth markets in the Smart Home space

The Omdia Smart Home Market Dynamics report (October 2021) takes an overall positive view with a 10-year expectation of high growth in electronic locks, water/temp sensors, and air quality. They expect a decline in smoke detectors, intruder alarms, video cameras and doorbells, fans and home audio as fewer used keep these devices in their home. They believe Matter will play a vital role in growth curve by allowing brands to shift resources to focus on value-added services and features.

Seven years after the launch of smart speakers to make it simpler to integrate and control home devices, we see a market that is doing well but not taking off. In my home, I have many of the devices noted above, but I do not have them all connected together. I have several phone applications I need to use with the smart speaker generally being the interface for my lighting. This means I fit in the category of having a connected home, but it really isn't very smart yet.

So how will Matter do on moving from connected devices to a smart home?

Interoperability and Ease of Use
Interoperability and ease of use have historically been key pain points for consumers. I know that I have installed and removed many home automation systems, while my family asked why it was so painful. Individual ecosystems have solved this many different ways, so it has improved over the years, but there is still not a common baseline for home devices.

Interestingly, Omdia reports recent consumer surveys indicate confusion over how devices integrate was last on the list of why consumers have not purchased smart home technology, being topped by items like use cases and price point.

First and foremost – the support of Matter from some of the largest ecosystems and smart home device ecosystems does mean it has the potential to resolve interoperability concerns and ease of use that have hampered devices in the past. Buying a device knowing it will be natively supported by Apple HomeKit, Google Assistant, Amazon or the Comcast Xfinity systems means I don't have to think about the separate applications per device or if my installed system will be compatible with a new device. Common and secure commissioning methods and native support in the underlying operating systems should help to resolve fear of adding new devices and ease of use issues for most consumers.

The set of Matter devices supported in the 1.0 release is a broad set of the simple devices across the home. This broad initial set covers the most common widely used devices in existing Zigbee® or home security systems. However, we can see some of the most common connected consumer devices like IP cameras, connected doorbells or appliances are not yet covered. While this is unlikely to slow Matter adoption, it is important to add the devices in the future to have a more seamless consumer experience.

Matter 1.0 devices supported

The final question on interoperability is will the devices that I buy from different manufacturers actually interoperate? Matter is being developed as an open source project with a common code base and common test harness that is used by all the silicon providers and device manufacturers. This situation means everyone is investing in the same solution and working together on a robust and complete test harness. This situation should provide better interoperability than everyone having independent implementations. There will still be software bugs and growing pains, but we will all be investing together to fix them.

Security

IoT device security will always be a moving target. New threats and attacks are invented, fixes are implemented, and the cycle continues. As of the end of May 2022, the CVE database lists over 10,000 new vulnerabilities disclosed this year – always showing how strong security is an ongoing effort. The basics tenants for good security on devices are relatively simple and being highlighted by industry standards and regulators:

› No common or default passwords
› Use standard well proven security algorithms and protocols to secure communications
› Keep software up to date and ensure software updates are authenticated and validated
› Monitor, identify and fix vulnerabilities as they are found

Matter will provide a substantial increase in security of IoT devices and follows these basic foundational elements.

Devices will have a certificate loaded during manufacturing that can be used to validate the device is from its manufacturer and has completed Matter certification. Once a Matter device joins a network it is provided an operational certificate that is used to establish secure communications within the network. Matter also requires all devices support secure over-the-air software updates, allowing devices to be upgraded and patched when problems occur. These steps all represent best practices for IoT devices today and are mandatory for all Matter devices.

In addition, the use of a common open source software will allow rapid identification and resolution of bugs or vulnerabilities. Not only product developers but security researchers, ethical hackers and others can review the code, perform testing and report problems to a common development team. Everyone using the Matter platform will benefit from improvements and security updates and these updates can be sent to deployed devices. The CSA and its members will operate a distributed compliance ledger tracking certified devices and their updates so users are more likely centralized controller software can check for software updates for devices in their network and ensure they are using the latest code. This common service is another large step forward for security of embedded IoT device.

Future Proofing

The press recently covered the latest closure of Insteon, another long-standing home automation company. The media coverage again laments the shutdown of cloud services that many of these devices and their homeowners relied on. Consumers are understandably confused when a product that they purchased no longer operates. This confusion causes hesitation in purchasing to avoid this obsolescence until the market figures out what works.

Matter being supported by all the major home ecosystems means as a consumer I can chose which I prefer in my home. If I no longer like the one I am using, I can move my devices to another ecosystem. The use of multi-administrator feature in Matter also means I can set my devices up with my Android phone but authorize my smart speaker from Apple or Amazon to also control the device. This sharing is a key feature of Matter and will reduce the development pain for the device maker, but also the confusion for the consumer. This situation also means that I do not need to worry about my favorite smart home application supplier deciding to no longer support my devices. The consumer now has options that use the same underlying protocols without needing to change out the devices in my home.

Future proofing also is related to the software update feature discussed above for security. The mandatory support of software updates also reduces the chance of my having an obsolete or stranded device as standards progress, bugs are fixed or new features are added. Consumers have been trained from experience with Wi-Fi and Bluetooth® that old devices and new devices can happily coexist in the home – and Matter should now bring this level of assurance to Smart Home devices.

The cost of connected devices

The cost of connected devices is always a concern as consumers need to see the value in return. For connected home devices, when the device is brand new – like a doorbell camera, the consumer does not have a real price comparison and they make a buying decision based on their need. The consumer takes a different look when comparing replacing a pro-gramable thermostat with a connected programmable thermostat. What is the cost of connectivity and what is the value to the consumer? If I can buy a programmable Thermostat for $39 and a connected programmable thermostat averages $105 – the cost of connectivity is 2.7x. What value does the consumer see from this connectivity and will they spend more for it?

I updated my cost of connectivity table for various smart home devices, and it has not changed a loT!

Cost of Connectivity ("dumb device" vs connected)		
Device Type	2018 Multiple	2022 Multiple
Thermostat	3.7	2.6
White LED Bulb	4.0	3.2
Color LED Bulb	5.1	3.5
Light Switch	32.3	25.1
Smart Plug	4.8	6.3
Door/Window Sensor	11.4	5.0
Door Lock	3.5	6.6
Smoke Detector	3.4	5.9

Will Matter have an impact on this cost?

In the short term, Matter will require more memory (both flash and RAM) on devices, so it will increase the cost of devices. However, device makers should be making fewer variants of devices for different ecosystems, and should see an increase in device volume, which should decrease their costs over time. Matter may also lead to lower cost for manufacturers entering the market since development of devices will be simpler. These factors may balance the cost increase.

Matter may also increase the perceived value for consumers. If they have more confidence in devices, and see more utility in a common experience and interface instead of the fragmented market today. This increased value may make adding connectivity more common.

Conclusion

Matter is well positioned to fundamentally change the existing fragmented connected home. Matter can reduce friction with consumers on device selection and interoperability, and free consumers to select their ecosystem of choice independent of the devices that they are using. Matter also is a large step forward in security and future proofing of devices. To truly create a connected home, Matter also will need to add other popular devices, such as appliances and IP cameras, but the initial release should provide a new step forward for consumers and the industry. Industry adoption will take some time, but the promise for consumers and the connected home are clear and worth the wait.

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