Innovation in action: developing the future of smart connectivity

Discover how we're shaping the smart home and smart industry

What makes a smart home, and what makes a home smart?

In the last ten years, the meaning and technology of the 'smart home' has evolved from simple colour-changing lightbulbs through to holistic energy management and security solutions.

This development has largely happened in silos within vendor organisations, and there's been little to no interaction between vendors that hasn't gone through an intermediate cloud broker or other 'partner' interface.

Up until now, this has worked fairly well. However, the industry is waking up to the fact that greater flexibility and interaction between vendors and technologies will unlock more benefits for vendors and consumers, and is ready for change.

But what does this proposed new way of collaborating look like?

'Matter', and realising the vision

An evolution of the Zigbee alliance, known as the Connectivity Standards Alliance (CSA), believes it may have the answer. Formed by over 450 business members, the CSA's mission is to ignite creativity and collaboration in the Internet of Things (IoT) environment by developing, evolving and promoting universal open standards that enable all objects to securely connect and interact.

The CSA governs a new API specification for smart home and smart industry devices called 'Matter'. The Matter protocol has a number of critical advantages that sets it apart from more conventional automation solutions, and opens the way for a more integrated, user-friendly smart future.

The key components of Matter

Multi-network

Matter is designed to operate across conventional wi-fi as well as the new radio protocol 'Thread' using a border router - meaning devices are able to address each other without needing to know which network other devices are connected to.

Industry developed

Over 450 participants have come together in development and agreement of the new unifying standard for in-home connectivity. The whole supply chain is engaged, from silicon manufacturers through to top-end retailers.

Multi-admin

No one vendor can isolate control of a device. In Matter, devices can be controlled or managed by more than one vendor or app simultaneously.

Promoting cross-compatibility

Matter provides a common language so that smart devices can interact with one another, helping consumers and organisations to do more with technologies from multiple disparate vendors.

The Matter

V1.0 specification was ratified in November 2022. Devices are progressively being Matter certified and released into the market.

How soon will Matter matter?

Matter exists as a developed standard today and will be further enhanced and developed over the coming years, as more advanced features are added in across a wide breadth of technologies.

The established 1.0 version covers core elements of the smart home such as doorbells, lighting controls, security and healthcare devices. More niche and novel technologies are being covered by the specification all the time.

A note of caution: although there's immense support by the biggest names of the industry for Matter, it's currently very early days (Matter was only released in November 2022), and the market is still reacting as vendors begin shipping the first Matter-compliant products.

While all the components and stakeholders have come together, it'll take time for the concepts of Matter and Thread to sink into the wider market and consumer awareness. We expect the appetite for Matter-driven technology to grow as public awareness increases, reducing the barriers to adoption.

At the moment, the latest versions of Android and iOS have support for Matter built in to ensure as seamless a transition as possible for the consumer. And some devices already in people's homes can be uplifted to support Matter / Thread through firmware updates.

What's helping the smart home ecosystem to develop?

Driver #1: consumer willingness to spend on automating domestic concerns

In recent years, consumers have welcomed automated point solutions in areas such as home security and energy and heating management, and demonstrated a willingness to buy when the product is good quality and delivers a reliable service at an affordable price point. This has caused a surge in providers and products as well as increased customer consumption.

Driver #2: affordable embedded hardware

Small chipsets which contain all the fundamental building blocks for a smart home device such as wi-fi, low power consumption, and peripheral support (such as temperature or motion sensing) have supported the development and mass production of affordable products. Low-cost manufacturing allows retailers to take substantial profits within a price point the consumer will pay. And increasing demand will drive down costs further.

Driver #3: the consumer love of an easy experience

Consumers want a hassle-free experience when onboarding new devices into their lives, and technologies using Matter make this increasingly possible. They're also looking to reputable, trusted organisations to help them on their smart home journey with tailored recommendations. They favour 'offloading' the management of services to a provider, for example Amazon's Ring Doorbell which stores the video footage off-site in AWS but gives any-time, anywhere access.

Driver #4: consumers welcome service bundles

Consumers often prefer a pre-assembled ideal solution, avoiding the guesswork involved in creating their own pick-and-mix solution. They want organisations they see as reputable in a technical field to provide product and management bundles.

What does a 'smart' future hold?

As the IoT becomes integral to smart homes and smart industry settings, we expect to see shifts in expectations, and new approaches to living and operating. Here's a taste of what our experts think is to come...

Widening industrial uses

Over time, organisations will start to see commercial lighting, heating, security and utility management systems connected by technologies such as Thread. It's likely that Matter will serve as a connectivity platform, thanks to its ability to operate across both novel Thread and conventional wi-fi networks. This could go on to apply to large-scale industrial processes including manufacturing and warehousing.

Since Thread is designed to scale to cover a vast number of devices, it's an ideal way to interconnect large industrial systems. While wi-fi has seen industrial success, it can struggle to operate effectively due to the high volume of metal used in industrial environments, as well as with the extent of the distances involved. Thread overcomes these issues by using automatic meshing, relaying and a protocol optimised for small bursts of data. As a further advantage, this may cut the amount of physical ethernet cabling needed, potentially saving on considerable installation costs.

Diversification

Matter brings flexibility to consumers and organisations, smart integrators and solution providers. It means no one is locked into a single ecosystem that might be complicated, expensive and unable to offer key requirements.

Consumers and organisations will be able to buy smart devices spontaneously, without worrying about whether the item will integrate with their environment, or whether the manufacturer will be around in the longer term to support the product.

For solutions providers, Matter means they won't be trapped in long-term detrimental agreements, and they're free to choose from any vendor. For example, if they're putting together a home security solution, they can pull together the best of multiple vendors. And, if one provider stops selling a component, it's easy to swap in another one from a different vendor.

Hyper-personalisation

Consumers will be able to have smart home services that are tailored to them and their home. Personal preferences, schedules and requirements will all feed into how an individual's smart home operates. In turn, service providers will deliver value-added services, information and experience enhancements that are bespoke to each customer.
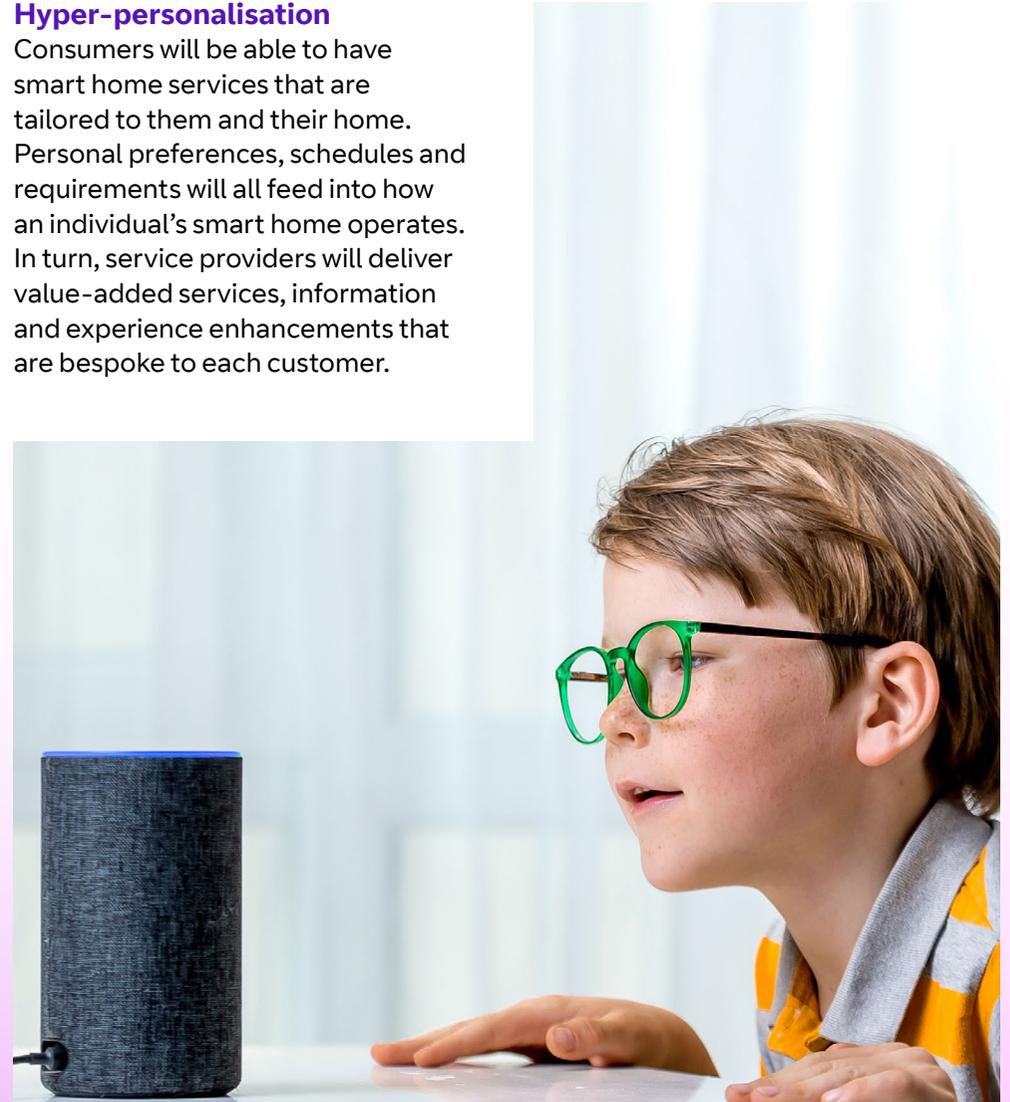
Going beyond – exploring the future of smart connectivity

We're proud of our strong research and innovation history, and our involvement in the field of novel connectivity for consumers and organisations. As you may expect, we're a core driving force within the development of smart home and smart industry technology as a member of the CSA and the Matter working group.

We also believe in giving our experts in our Research and Network Strategy division free rein to develop, explore and evaluate use cases that could support our customers in their smart environments. Our specialists' appetite for innovation and invention, combined with our commercial expertise, insight and realism mean we investigate the best opportunities for value-added services that go beyond the fundamentals of connectivity solutions.

At Adastral Park, our research headquarters, we've built a technical testbed specifically targeted at validating novel products and services for smart homes and smart businesses. In partnership with the University of Suffolk, we've created an architectural and technological smart home that incorporates the latest innovative, environmental and ecological materials for sustainability. Here, we jointly research all the issues that will shape our future - including connectivity.

Discover how we innovate for a connected world by visiting atadastral.co.uk.