

ACRS



IoT

Current & Future Trends
White Paper



The Internet of Things (IoT) is a network of objects and devices that can exchange information through the internet – microchips can be inserted into objects, allowing them to connect to the internet and become “smart”. As a result of decentralised computers becoming smaller and more affordable, the IoT has evolved significantly over the past several years.¹

Objects are now connected in many ways – they can speak to each other, receive instructions, set alerts, and are all co-ordinated through a smartphone app or home assistant such as Google Home and Amazon Alexa. However, while some IoT objects such as the Apple Watch have seen huge uptake, other products such as connected toasters or hairbrushes have not experienced as much growth. This whitepaper provides examples of the IoT technologies currently available and explores the barriers discouraging consumers from adoption.

Smart Homes



A technologically enabled home was once nothing more than a dream, but these days consumers can create a fully smart home complete with a voice recognition control system.

In fact, many smart home products such as smoke alarms, speakers, air conditioners, and cooking systems are already connectable, creating an ecosystem of centrally controlled devices.

THE KITCHEN is considered the heart of the home, with over half of consumers spending between one to two hours in the kitchen per day.² In Australia, reality cooking shows have taken off, with the My Kitchen Rules finale reaching over 2.3 million viewers across Australia in 2017,³ prompting consumers to try cooking gourmet food at home. But while consumers are experimenting with gourmet cooking within their homes, some still need assistance to create restaurant-quality food. Enter existing IoT kitchen appliances which help make the cooking experience smoother and more convenient.

Connected through the IoT, many home appliances and whitegoods are usable remotely. [Anova's](#) sous-vide (a cooking device that uses water or steam to slow-cook foods) can be used remotely, allowing consumers to enjoy dinner as soon as they arrive home. [Electrolux](#) recently developed a smart oven that can be remotely controlled through a smart phone, set exact temperatures, and even send recipes to the oven in order to automatically set the temperature and cooking time. Whirlpool intends to follow suit and integrate recipes into their smart ovens following their recent purchase of Yummly, an online database for recipes. Other smart kitchen appliances include Haier's ventilation hood that connects with a user's smart doorbell, allowing users to let people into the house without leaving the kitchen.

Sustainability has also entered the kitchen, resulting in the creation of IoT devices that help cut down on food waste. Technology being introduced to tackle food waste includes the [Smarter FridgeCam](#), a camera that monitors expiry dates of food and communicates

this information to a user's smartphone. [Samsung](#) also has cameras embedded in its Family Hub Refrigerator to allow users to view the contents of their fridge at any time. These technologies help tackle the 3.1 million tonnes of edible food thrown away in Australia alone each year.⁴

THE BATHROOM is another area of the house becoming connected to the internet, with [Kohler](#) recently announcing a range of new smart devices designed for the bathroom. For example, Kohler's 'Verdera' is a smart mirror connected to the voice assistant Amazon Alexa that can check emails, read the news for you, change light settings through voice commands, and much more. Kohler also revealed their smart toilet – 'Numi' – that uses sensors to automatically flush and raise its lid, while utilising smart and touch-screen technology for controls such as seat-heating, music, and individual user settings.

HOME SECURITY AND SAFETY products such as smoke detectors and security cameras have become smart. For example, [OneLink](#) released its 'Safe & Sound' smoke detector which is fully integrated with Google Assistant and Amazon Alexa. Another example is Protect, a total home security system controllable through a smartphone. The system provides live video monitoring, access to remote smart locks, remote lighting controls, and security alerts, usable from anywhere. The company also provides a professional monitoring system for when residents are away from home.

Other smart security and safety products available include smart locks, movement sensors in windows, and a range of other products that can be externally monitored.

Wearable Technology



The home is not the only part of a consumer's life that is becoming smart and there are now a number of wearable technologies that can connect to the IoT. For example, Fitbits, which allow consumers to easily track their fitness and health at home and on the go, exploded onto the scene several years ago and now have 25 million active users.⁵ Connected jewellery is also a growing trend, with earrings, bracelets, and necklaces allowing consumers to track sleep, stress, health and wellness, and even send alerts when the wearer is in danger (one such example, [Artemis](#), can send an audio recording to emergency contacts when tapped three times). Other newer wearable technologies still in development make life more convenient like [Token](#), a ring that acts as a digital wallet or set of keys. Token can store a variety of information including credit card details, passwords, smart house keys, car keys, and transit cards, with information secured through fingerprint scanning technology.

Sensors are also being incorporated into clothing, allowing Bluetooth feedback to smartphone apps. For example, [Nadi X](#) is a pair of yoga leggings designed specifically for self-guided yoga sessions. The sensors detect when a wearer is posing incorrectly, sending vibrations to the area that should be focused on. The leggings are connected to the wearer's smartphone that determines the specific pose the wearer is trying to hold.



Connected Cars

In addition to becoming electric, cars are increasingly able to connect to the internet, allowing manufacturers to identify problems before they occur and update software to ensure smooth driving. For more details on connected cars, read our [whitepaper](#) on the automotive industry – *The Future in Motion: Automotive Current & Future Trends*.



Byton's autonomous, electric concept car aims to bridge the gap between tradition and vision by blending bespoke lounge experience with digital provisions.

IoT in the Retail Industry

Many companies are recognising the importance of IoT technology to business efficiency – 70% of decision makers in the global retail industry report that they are ready to adopt IoT technology to improve customer experiences.⁶ Some retailers such as Kaufland (a leading grocery chain in Germany) are already automatically updating product prices through electronic shelf labels. Labels are updated through a centrally controlled system, rather than manually updated by employees, and can sync with online stores and inventory systems to display stock information and consistent pricing. Beacon technology is another IoT device available to retailers, allowing them to sync online and offline customer profiles to provide immediate and personalised promotions to the smartphones of individual customers walking in or past the physical store.

Samsung has recently launched an IoT pop-up store that retailers can rent. The pop-up store is fitted with a range of sensors to track foot-traffic, dwell time, and demographics, providing renters

with significant amounts of data to aid decision making. The store can be adjusted and inventory updated based on data.



Barriers to Uptake

IoT technology is not futuristic – it is available and ready for our homes. However, some consumers are still wary of adopting these products. Price is a significant factor – 42% of non-adopters in the US indicated price as their primary barrier to adoption.⁷ As with many new technologies, the cost of manufacturing IoT devices will likely decrease in the future, lowering prices for consumers. However, it remains to be seen if lower prices in the future will lead to increased adoption of IoT devices.

Security is another major concern, particularly with reports of IoT devices providing pathways for hackers to access networks. This concern is not unfounded – the US experienced a major hacking in 2016 through IoT devices that shut down major websites such as Netflix and Twitter.⁸ Consumers are also concerned about the collection and usage of data. Seventeen per cent of non-users indicated that privacy and data security were their primary barriers to purchasing a smart device.⁹ This means two things for companies: the software used in

smart devices must be secure, and that companies need to be more transparent with how they collect and use customer data.



Another barrier specific to the adoption of IoT in Australia is the slow release of IoT devices. For example, despite being available in the US market since 2014, [Amazon Alexa](#) was only officially released in Australia earlier this year. Australians are not innovation-averse however – in fact, the Australian market for IoT devices is expected to be worth \$4.7 billion within four years.¹⁰ – Rather, IoT technology is simply less accessible. Many of the technologies widely available across the globe have only just entered Australia or are still on their way.

The Future of IoT

The Internet of Things is still in its infancy, though it has the potential to grow significantly. There are already many examples of existing products, or products in development, that can enhance our lives. Companies can collect incredibly useful data about consumers from IoT devices. However, they need to ensure that devices are actually useful and that consumers are reassured that their data is securely stored.

About ACRS

The Australian Consumer, Retail, and Services (ACRS) Research Unit assists retail and services organisations seeking to better understand consumers, traverse global trends, identify best-practice, or employ marketing as a source of competitive advantage. Positioned within the Monash Business School's Department of Marketing, ACRS has a 35-year history as a globally respected source of retail, services, consumer and marketing knowledge. ACRS combines the latest academic research advances with business relevance, practicality, and strategy.

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