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About this report
For this report, references to connected/smart (home) devices or technologies refers to any devices (and associated services) which are either directly or indirectly connected to the internet. Data in this report draws on a consumer survey of UK adults 16+ conducted by GfK on behalf of techUK. The data is weighted to nationally representative profiles. 2016 participants = 1031; 2017 participants = 1002; 2018 = 1000; 2019 = 1000. This year we have modified some of the categories clarifying that all questions are related to smart devices connected to the internet with an intuitive configuration.

This is the third year in a row that techUK, in conjunction with GfK, has published The State of the Connected Home. The report also covers how techUK is working with industry and Government to tackle some of the challenges and makes recommendations to encourage widespread adoption.

With polling from 1,000 UK consumers, the report highlights how market appeal, consumer understanding and ownership has shifted from 2016, as well as the constraints on uptake.

For the first time, we have assessed the purchasing drivers of consumers and have further explored the main barriers that has been a stumbling block for the last three years – cost.

We have analysed what types of devices the consumers use to control their environment and what role the ecosystem plays.
Welcome to the Connected Home
The Connected Home is one in which everyday devices and sensors connect, communicate, transfer data and increasingly take autonomous action. The Connected Home is carving out a place for itself in the consumer market. The clearest offerings for these devices and services are in smart home entertainment, security systems, thermostats, lighting and energy monitors.

A PWC survey indicated that £10.8 billion will be spent on smart home devices in 2019, in the UK.¹

2018 was all about getting products into consumers’ homes. Both Amazon and Google excelled at this through low-cost smart speakers and multiple bundles across device categories. This is reflected in our survey as well.

However, in 2019 businesses are more focused on tying the various devices together to form a more cohesive experience and more importantly, layering in additional services.

The overall smart home market is expected to grow from USD 76.6 billion in 2018 to USD 151.4 billion by 2024 globally. ²

Smart home technology is really a means to an end to enhance ones life and promote comfort, safety, and having control.

¹ https://www.pwc.co.uk/industries/power-utilities/insights/energy2020/connected-home.html
² https://www.marketsandmarkets.com/Market-Reports/smart-homes-and-assisted-living-advanced-technology-and-global-market-121.html?gclid=EAIaIQobChMlv3wsKz94giVikPTCh0DiADeEAAAYASAAE-gLpvD_BwE
2019 highest level of knowledge about smart homes to date

59% of people identified cost as a key barrier to adoption

52% of people are confident they can use a smart home product

25-44 age group own the most smart devices

31% of the 35-44 age group own 3 or more devices

52% of people would pay more for a smart product which improves their home security

12% of people would pay a premium for a smart product that accurately monitors their health

64% of owners control their smart energy and lighting devices via their smartphone, while 32% use a smart speaker
Top smart products of 2019

- Smart TV
- Smart speaker
- Smart thermostat
- Smart fitness + activity tracker
- Smart detectors for smoke and gas leaks
- Smart washing machine

People owning smart devices control them mostly via their smartphone.

Smart energy and lights is the category most controlled via smart speakers.

Top drivers for adoption
- Confidence
- Interoperability
- Comfort

Top barriers to adoption
- Cost
- Privacy
- Knowledge
Familiarity and trends

More than a third of consumers now feel like they know a lot/a fair amount about smart home technology - continuing the rising trend after a moderate plateauing in 2018.

Familiarity with tech trends in general remains relatively stable. The largest increase in familiarity is in the smart home and wearable technology.

Although knowledge in the top technology trends seems insignificant, general common knowledge is at its highest level to date.
67% of consumers are knowledgeable about artificial intelligence (AI).

For the first time, we have included AI in our technology trends. Due to the ever expanding applications of AI, it will not only change our workplace but also change the way we live in our homes.

Smart home products and applications increasingly feature AI or machine learning elements; from voice recognition to understanding patterns of behaviour and tailoring the home environment to suit. We wanted to explore how familiar consumers were with this technology.
The increase in consumers who find smart appliances extremely appealing has grown mainly due to an increase in product innovation and offering.

The growth of the smart speaker market is primarily driven by the increased adoption of smart home technology, high disposable income, the popular trend of personalisation, and the rapid proliferation of multifunctional devices.

In contrast, there is a slight decline in strong appeal among owners of smart entertainment products, smart TVs perhaps do not seem quite so “smart” as a wide range of products are now available. The data shows that owners of smart entertainment devices are less and less likely to find the category overall as extremely appealing.

Furthermore, recent developments in artificial intelligence and natural language processing to enhance voice recognition capabilities have increased the overall appeal of smart speakers in smart homes.

The slight improvement in appeal of smart appliances might be connected to the modest growth in ownership of smart appliances - where owners are extremely positive.
Each of the top 10 products have increased in ownership for all age groups in comparison to 2018. 3 out of every 5 consumers now own at least 1 smart home device.

Smart entertainment products and fitness and activities tracker are most popular amongst those who own one or two devices. The younger, more engaged, age group have a higher number of energy and security products. The growth in this category was initiated by the early adopters.

Now growing steadily, the data suggests a correlation with the age group of first home buyers. Older age groups prioritise detectors for smoke or gas leaks over speakers, counter to the general trend.

For consumers with just one smart device, this is overwhelmingly likely to be a smart TV. Smart speakers and fitness trackers are also prominent among those who own just 2 or 3 smart home devices. It’s only among those who are more heavily invested in smart home devices that we see energy management, lighting and security products being widely owned.
Drivers for adoption

Consumers expect connected home devices to be easy to use and to work with other products in their personal ecosystem.

They also expect devices to be fun to own and make their lives easier. These expectations are the key drivers of interest in smart home technology ahead of specific advantages over more traditional products.

The presence of established/familiar brands have created a greater sense of trust having products with more benefits in certain categories such as smart appliances and entertainment.

Smart health however has different drivers to other categories which possibly attuned to specific functions. Understandably, there is less expectation that smart health products will be fun and connect with other devices.

### Drivers to smart home products

- I am confident I will be able to use it: 52%
- It’s really important that it works with other devices in the home: 48%
- It would make my life easier: 42%
- It will be fun to own: 42%
- It has significant benefit over traditional alternatives: 38%
- I trust the brands that promote it: 31%
- I read and hear a lot of good things about it: 30%
- I’ve seen advertising that really stimulates me to buy it: 25%

SMART ENTERTAINMENT HAS THE HIGHEST PURCHASE DRIVERS
Barriers to adoption

Perceived cost, concerns about privacy and security and lack of knowledge are the primary barriers to take up. This is consistent with previous years.

Barriers to purchase

- I think the cost to purchase products would be too high: 59%
- I would be concerned about personal privacy: 49%
- I don’t know enough about this category: 42%
- I am concerned about this technology and the impact on security in my home: 41%
- I don’t believe this technology could meet my needs/expectations: 30%
- It’s too much effort to learn how to use it properly: 28%

Citizens Advice research also shows that many concerns are based around safety and security related to products being unreliable, and data breaches, indicating a lack of knowledge about what fail-safes are in place and a lack of trust in smart technology manufacturers. The cost of purchasing and maintaining smart technology and the complexities of operating it are also commonly shared concerns.¹

An alternative way to view appeal is to ask about willingness to pay for some of the benefits that smart and connected products can offer.

While many are resistant to paying any extra for smart products, up to half of consumers say they are willing to pay more for some of the benefits relevant to smart home products.

Critically, consumers are more likely to say they are willing to pay for category benefits than say they find smart devices appealing. This points to the need for brands, retailers and service providers to focus on communicating product benefits to consumers ahead of simply badging products as “smart” or “connected”.

**Willingness to pay**

<table>
<thead>
<tr>
<th>Category</th>
<th>Very Appealing</th>
<th>Would Pay More</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Appliances</td>
<td>29%</td>
<td>44%</td>
</tr>
<tr>
<td>Smart Health Monitor</td>
<td>32%</td>
<td>48%</td>
</tr>
<tr>
<td>Smart Entertainment</td>
<td>41%</td>
<td>52%</td>
</tr>
<tr>
<td>Smart Security</td>
<td>35%</td>
<td>46%</td>
</tr>
<tr>
<td>Smart Energy</td>
<td>36%</td>
<td>40%</td>
</tr>
</tbody>
</table>

**Appeal vs. cost**

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Would Pay More</th>
</tr>
</thead>
<tbody>
<tr>
<td>A smart product that accurately monitors my health</td>
<td>12%</td>
</tr>
<tr>
<td>A smart product that makes my life more convenient</td>
<td>10%</td>
</tr>
<tr>
<td>A smart product which enhances my home entertainment system</td>
<td>9%</td>
</tr>
<tr>
<td>A smart product which improves my home security</td>
<td>13%</td>
</tr>
<tr>
<td>A smart product that monitors my energy usage</td>
<td>8%</td>
</tr>
<tr>
<td>A smart product that can help me with domestic chores</td>
<td>11%</td>
</tr>
</tbody>
</table>

**Willingness to spend**

<table>
<thead>
<tr>
<th>Would Pay More</th>
<th>Would Pay Premium</th>
<th>Would Buy the Same</th>
</tr>
</thead>
<tbody>
<tr>
<td>30%</td>
<td>40%</td>
<td>39%</td>
</tr>
<tr>
<td>49%</td>
<td>32%</td>
<td>46%</td>
</tr>
<tr>
<td>46%</td>
<td>32%</td>
<td>40%</td>
</tr>
<tr>
<td>52%</td>
<td>30%</td>
<td>44%</td>
</tr>
<tr>
<td>44%</td>
<td>31%</td>
<td>39%</td>
</tr>
</tbody>
</table>
Device control

Smartphones are, by a significant margin, the number one means for controlling other smart devices.

Smart health and smart domestic appliances have the lowest level of connection post purchase and the lowest level of usage after purchase.

The low degree to which consumers control smart TVs using over devices is notable. It’s arguable that while the majority of TVs might be connected, relatively few are truly smart.
Device connectivity

Smart appliances and smart energy have the lowest level of connectivity and usage once purchased.
Connected home ecosystem

A smart meter is the most popular smart asset outside the products already reviewed. In our report from 2018, we discovered that smart meters are a gateway for consumers to engage with the energy market and purchase more connected home devices.

Smart meter owners are most likely to be invested in other smart products too, with smart appliances being the most popular category for asset owners.

With the national roll-out of the technology many energy providers are now innovating and combining dynamic tariffs, incorporating electric vehicle adoption. The dynamic tariffs will allow the consumer to be more comfortable, and pay lower energy bills - opening up the range of benefits that smart appliances can deliver.

What other home assets do consumers own?

<table>
<thead>
<tr>
<th>Asset</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart meter</td>
<td>40%</td>
</tr>
<tr>
<td>Electric car</td>
<td>5%</td>
</tr>
<tr>
<td>Electric vehicle charge point</td>
<td>4%</td>
</tr>
<tr>
<td>Home electricity generation devices (e.g. solar panels)</td>
<td>8%</td>
</tr>
</tbody>
</table>

How much more likely are owners of these assets to own smart home devices?

<table>
<thead>
<tr>
<th>Asset and Description</th>
<th>Smart domestic appliances</th>
<th>Smart entertainment</th>
<th>Smart energy</th>
<th>Smart security/control</th>
<th>Smart health monitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A smart meter</td>
<td>17%</td>
<td>55%</td>
<td>32%</td>
<td>30%</td>
<td>31%</td>
</tr>
<tr>
<td>An electric car (e.g. purely electric or a plug in Hybrid)</td>
<td>61%</td>
<td>71%</td>
<td>61%</td>
<td>64%</td>
<td>60%</td>
</tr>
<tr>
<td>An electrical vehicle charging point</td>
<td>66%</td>
<td>70%</td>
<td>60%</td>
<td>68%</td>
<td>64%</td>
</tr>
<tr>
<td>Home electricity generation devices (e.g. solar panels)</td>
<td>34%</td>
<td>61%</td>
<td>34%</td>
<td>47%</td>
<td>47%</td>
</tr>
</tbody>
</table>
Conclusion

More than half of consumers are confident that they can use new smart products - which is a tipping point for this sector. Knowledge about smart home products is at its highest since we first published this report. However, the barriers to adoption remain the same around cost and privacy. The good news for brands and the industry is a key finding that consumers are willing to pay a premium for smart products, once the added value of owning has been clearly explained to them.

Whilst cost continues to be a the most significant barrier for adoption of smart products, we can also see that it can be overcome by clearer and targeted messaging. As in previous years, the ability to demonstrate the value of smart devices at point of sale is a key factor for enabling growth and breaking down some of these barriers.

We are also beginning to see the emergence of the concept of an ‘ecosystem’ of products, from a consumer perspective. This concept has long been held within the industry but, to date, we haven’t seen a huge resonance in the consumer’s mind of the same. We believe this might be partly enabled and accelerated by the increasing ownership of smart speakers which are fundamentally built around the existence of an ecosystem of connected devices.

techUK drives the conversation of privacy and security especially for smart domestic appliances. We support the Department for Digital, Culture, Media & Sport’s Secure by Design Code of Practice, which advocates for cyber security measures to be built into smart products right from their design stage. We do take into consideration key industry standards already existing for IoT, but also we see this as an important step in helping stamp out poor security practices in the sector.
Recommendations

For Industry

1. Continue to develop our narrative around the value and benefits that smart home technologies can deliver. This report shows that industry is still struggling to do this although momentum does appear to have shifted in the last 12 months.

2. To actively work together to address concerns that consumers have about the security and privacy of the smart home. This will require tangible action and techUK will continue to convene industry to address these issues.

3. Establish and deepen the messaging around how the ecosystem and network of smart home technologies can bring even greater benefits to the consumer.

For Government

1. To recognise the role that smart home technologies can play in delivering against some of the Industrial Strategy’s Grand Challenges of an Ageing Society and Clean Growth, including the goal to be carbon net-zero by 2050.

2. To work with industry to help address security and privacy concerns. This can be through the technical assistance of the NCSC to, where necessary, include cyber security of devices and products in regulation.

3. To work together with connectivity providers and energy suppliers to provide the best ecosystem for the market to flourish. This includes pushing forward with commitments made in the Smart Systems and Flexibility Plan.
Appendix | Product changes for 2019

As part of the 2019 edition of the project, we streamlined the product list to be more relevant to the market. We feel this has led to more accurate data.

### Categories

<table>
<thead>
<tr>
<th>Smart domestic appliances</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart kettle/Smart coffee maker (combined two old products)</td>
<td></td>
</tr>
<tr>
<td>Smart refrigerator</td>
<td></td>
</tr>
<tr>
<td>Smart washing machine</td>
<td></td>
</tr>
<tr>
<td>Smart oven/hobs (new addition)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smart entertainment</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart speakers (eg Google Home/Amazon Echo)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smart energy and lighting</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart thermostat</td>
<td></td>
</tr>
<tr>
<td>Smart plugs</td>
<td></td>
</tr>
<tr>
<td>Energy management service/app</td>
<td></td>
</tr>
<tr>
<td>Smart lighting (smart lamps)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smart health monitors</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart monitor for specific health conditions</td>
<td></td>
</tr>
<tr>
<td>Smart fitness and activity tracker</td>
<td></td>
</tr>
<tr>
<td>Smart connected scales</td>
<td></td>
</tr>
<tr>
<td>Smart connected toothbrush</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smart security and control</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart/connect alarm system</td>
<td></td>
</tr>
<tr>
<td>Motion camera sensors for external doors/windows</td>
<td></td>
</tr>
<tr>
<td>Internal camera for baby, pets or security</td>
<td></td>
</tr>
<tr>
<td>Smart access control (digital keys)</td>
<td></td>
</tr>
<tr>
<td>Smart doorbell</td>
<td></td>
</tr>
<tr>
<td>Smart detectors (for smoke and gas leak)</td>
<td></td>
</tr>
</tbody>
</table>

### Products removed this year

- Smart air conditioner
- Smart tuner/amplifier/receivers
- W-LAN sticks
- Monitoring of boiler at a distance
- Smart blinds or shutters
- Baby monitors
- Medication monitor/reminder
- Smart meter
- “Smart” Wi-Fi router