Smart Home

By Giles Godart-Brown

What is Smart Home?

A Smart Home uses internet-connected devices to enable remote monitoring and management of systems and appliances.

- Convenience
- Security
- Efficiency
- Comfort

There are lots of Smart Devices on the market

- Smart Thermostats (e.g., Nest, Hive, Ecobee)
- Smart Lights (e.g., Philips Hue)
- Smart Security (cameras, doorbells like Ring)
- Smart Plugs & Appliances
- Smart Speakers (e.g., Amazon Alexa, Google Assistant)
- Smart Meters

A Smart Device doesn't make a Smart Home

- Smart Devices on their own don't really make the Home Smart.
- The key to a Smart Home is a device able to talk to ALL of the devices and use the information from them to perform smart actions, e.g. A motion sensor connected to the Alarm is used to turn on lights.

What technologies are involved?

Smart Devices (sensors, lights, thermostats, cameras) use the following technologies
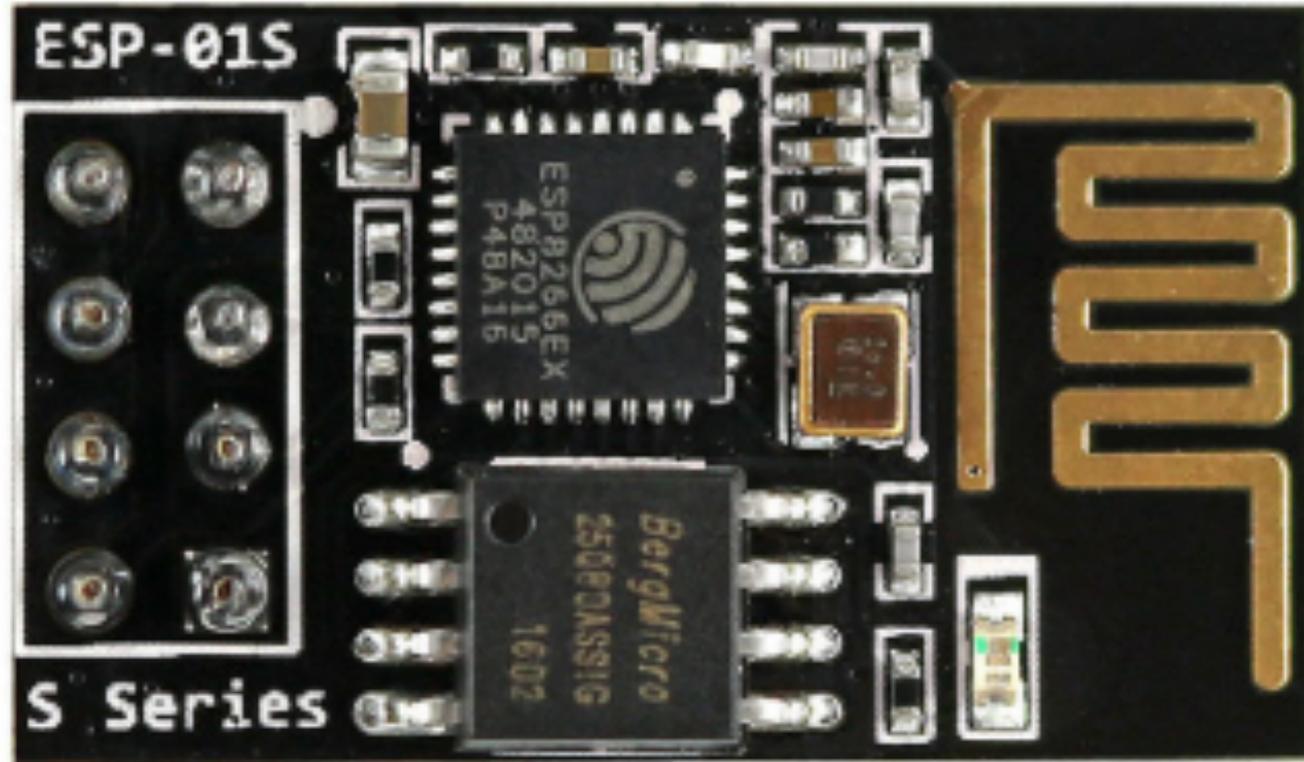
- Internet of Things (IoT)
- Wireless technologies (WiFi, Zigbee, Z-wave)
- Central hub or app for control (e.g., Smart Speaker, Phone, Tablet, PC, Raspberry Pi with Home Assistant)
- Cloud-based data processing (e.g. Tuya)

IoT demos

By Giles Godart-Brown

IoT demos

The Expressive ESP8266 and Smart Switches

Smart Speaker

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What is a Smart Speaker used for?

A Smart Speaker allows you to use voice commands for the following activities;

- Time management (alarms, timers, reminders, calendar)
- Audio entertainment (stream music, radio, podcasts, jokes, games)
- Getting Information (news, weather, calendar, Q&A)
- Telephony (hands free calling over the internet)
- Shopping (particularly with Amazon Alexa)
- Home automation (control lights, locks, thermostats)

Who makes Smart speakers?

- Amazon - Alexa based devices e.g. Echo
- Google - Home
- Apple - HomeKit
- Samsung -SmartThings

The market is dominated by Apple with Google a distant second.

Smart Home demo

By Giles Godart-Brown

Smart home demo based on Alexa

- Entertainment - radio podcast

- Time management - timers, reminders, alarms and calendar

- Information - News and weather

- Telephony

- Simple Smart Switches

- Seamans system

Smart Metering

By Giles Godart-Brown

What does a Smart Meter do?

- A Smart Meter records your consumption of electricity, gas, or water in real time and sends the usage data automatically to the utility provider.

- The law requires all old analogue meters to be replaced by Smart Meters by the end of this year.

How do they work?

- They send usage information to the utility provider usually via the mobile phone network.

- They also receive data from the network provider on rates, off- peak times etc.

- In places of poor mobile coverage, extra boosters are being installed at the top of high poles fitted with a solar panel e.g. at the entrance to Mayfield Way

- They have a display device in the house showing consumption not only in units but also in £.

- I would argue that though 'Smart' for the utility provider, they don't contribute to the Smart Home as they are all 'closed' systems.

Privacy

By Giles Godart-Brown

Privacy

- There are some concerns about the privacy of the data that Smart Meters collect, but the Utilities providers insist that it is secure.

- There is concern about the privacy of doorbell cameras. If your doorbell camera records outside the boundary of your property such as the street or neighbouring homes or gardens, then you have responsibilities under the General Data Protection Regulations (GDPR).