Oliver Collins-Cope

2102775@rutc.ac.uk

Learning aim A

Examine systems and services that form part of the Internet of Things

UNit 19 Internet Of Things

Assignment 1

Contents

`[Introduction 2](#_Toc126068329)

[What is the IoT? 2](#_Toc126068330)

[What do we use IoT for? 2](#_Toc126068331)

[IoT Systems 2](#_Toc126068332)

[Home 2](#_Toc126068333)

[Health 2](#_Toc126068334)

[Industrial and transportation 2](#_Toc126068335)

[Retail and commerce 2](#_Toc126068336)

[Principles behind IoT 2](#_Toc126068337)

[Characteristics of IoT systems and services 2](#_Toc126068338)

[General characteristics 2](#_Toc126068339)

[Technical characteristics 2](#_Toc126068340)

[Home Sector 2](#_Toc126068341)

[Smart Doorbell 2](#_Toc126068342)

[Smart Lighting 2](#_Toc126068343)

[Health Sector 2](#_Toc126068344)

[Remote Patient Monitoring 2](#_Toc126068345)

[Pacemaker 2](#_Toc126068346)

[Comparison 2](#_Toc126068347)

[Evaluation 2](#_Toc126068348)

# Introduction

# **What is the IoT?**

## What do we use IoT for?

# **IoT Systems**

## Sector Home

## Sector Health

## Industrial and transportation

## Retail and commerce

# Principles behind IoT

# **Characteristics of IoT systems and services**

## General characteristics

## Technical characteristics

# **Home Sector**

## Smart Doorbell

A smart doorbell is a great example of an IoT system that is commonly used in the home sector. A famous example of the smart doorbell is the ring camera, which works through an application on the phone and an internet connection.

### *Purpose*

The purpose of the smart doorbell in the home sector varies depending on the person, however it follows the general idea of serving as a way for people to view their front door while not answering the door or not being home. Another purpose for this IoT system is to be used as a way to receive a parcel or speak to the delivery driver in order to request that a parcel is left inside or nearby, or any other instructions.

### *How does it work?*

The smart doorbell works similarly to most IoT systems. In this specific example of the Ring doorbell, it works by first being calibrated and connected to a network that is constantly operating nearby. This is most commonly done on a mobile device such as a phone or tablet, however some products may offer a desktop setup. Once the doorbell has been connected to a network, it is setup outside of a door and holds a sensor that works based on motion detection or button activation when someone would press a button on the doorbell to “ring” the doorbell. This then sends a notification through the internet onto a mobile device that also has an internet connection, and also has the specific software for the hardware, which in this situation is the doorbell. Once the notification has been received, the user can access the application and view the live camera feed, choosing whatever action they want, whether that be answering the door or talking to the person through the doorbell.

## Smart Lighting

Smart lighting is another great example of an IoT device that has come into the limelight recently. It provides people with a way to control lighting both inside and outside of the house, ensuring that money is not lost on electricity bills from the lighting. Additionally, these lights usually tend to be LEDs with multiple colour options, giving more life to peoples living rooms and many more.

### *Purpose*

As mentioned above, the primary purpose of smart lighting is to provide people with a way to turn lights off and on remotely. This has a host of benefits that greatly improve quality of life, such as being able to control all the lights in the house from a mobile phone, and not having to worry about whether all lights are disabled once someone leaves the house as they can just check through their phone. They also tend to have an added benefit of offering multiple colour options and being LED lights.

### *How does it work?*

Smart lighting works similarly to the Smart Doorbell. Initially, the light is screwed into an empty light. From there, a user will have a specific application that they are required to download, the software, in order to connect to the light and calibrate it. Similarly, the light must be calibrated by being connected to the network so it has constant access to the internet. Once calibrated, the user is then able to send a signal through the internet containing the instructions for the light that they accessed through the application, such as turn on, turn off, change colour, and change brightness.

# **Health Sector**

## Remote Patient Monitoring

Remote patient monitoring is one of the most recent inventions from the health sector that allow clinicians and technicians to monitor patient’s health from remote locations such as their office. It works as a way for patients to remain out and about while also remaining monitored, giving them more freedom in their life but not sacrificing their safety, security and health.

### *Purpose*

The purpose of remote patient monitoring is to communicate important information about patients to clinicians and technicians, and once this information has been communicated then the healthcare professionals are able to make adequate and important decisions while being well informed. Finally, this is a great way for patients to continue to live their life while not jeopardising their health and the quality of any reports they might have to make about it.

### *How does it work?*

Remote patient monitoring works by connecting to a mobile device through a network like Bluetooth or 4G, and then transmits the necessary data to the hospitals and healthcare professionals. One device that tracks information like this is a weight scale, and another example is a blood pressure monitor. This is accomplished by connecting these to the network or mobile device, which sends the information to the hospital without any input from the patient.

## Pacemaker

A pacemaker is a vital piece of IoT that works inside of patients to send electronic pulses to your heart to keep it beating at a regular and adequate speed in order to make sure that your heart is functioning properly, and there are no issues with your heartbeat. This is a device that can be crucial in improving people’s quality of life if people have issues with slow heartrate and for others, it can be lifesaving.

### *Purpose*

The purpose of a pacemaker is described as above. It works to keep the heart beating at a constant and regular pace to make sure that it is not too slow. This can prevent a number of issues, most notably, a slower heartbeat which can greatly impact someone’s ability to live a normal life. It causes issues such as chest pain, confusion, memory problems, and dizziness or light-headedness.

### *How does it work?*

A pacemaker works by being installed just above someone’s heart under their collarbone, and senses, using wires, whether or not the heart is beating fast enough. If it is not, or it misses even a single beat, it sends an electrical pulse to the heart, causing it to beat. Recently, pacemakers have had options to connect to a network, giving information to doctors and healthcare professionals about the patient data and information regarding their heartbeat. This is calibrated before it is installed by the healthcare professional/hospital employee.

# **Comparison**

# **Evaluation**