

# Unit 18/19: The Internet of Things

**Assignment A:** Examine systems and services that form part of the Internet of Things.

## Scenario

You have recently started work as an IT technician in the technical department of a small company that specialises in security systems and burglar alarms. The director of the company is interested in investigating if the company could make use of Internet of Things (IoT) technologies in its products and services and your manager has asked you to look into what is involved in this area.

## Specification - Local Link

<file:///C:/Users/ronal/Desktop/IT%20-%20Unit%2019%20-%20IoT/Unit%2019%20-%20Spec.pdf>

Show how to do headings and insert table of contents.

## Assignment A Brief - Local Link

<C:\Users\ronal\Desktop\IT - Unit 19 - IoT\ Unit 18 - Part A – Brief.docx>

## Task Notes

Create a Wiki in which you **evaluate IoT systems** from **different sectors** including **home** and **industrial/transportation**. Your evaluation should **cover the purpose, applications, principles** and **characteristics** of the systems, covering at least 4 different devices used in 2 different sectors. You should also cover the **benefits and risks of each system**.

Your wiki should be logically structured and easy to read by a third party, using appropriate technical language throughout.

## Table Of Content

# P1 - Describe the purpose and application of IoT systems and/or services from different sectors.

## What is IoT?

Give a reference or two.

The sectors of IoT or the sectors which incorporate IoT.

[Google Search: IoT Sectors](#) (or use list from application below).

Break down that overarching heading into two smaller questions.

Describe the **purpose** of IoT systems and/or services.

Describe the **application** of IoT systems and/or services.

## Purpose of IoT

To increase: productivity, safety and security, efficiency and effectiveness, user experience and satisfaction.

Describe each one and give an example either from the spec or from the internet. Reference everything.

[Google Search: The Purpose Of IoT](#)

## Application of IoT

Home, health and wellbeing, Industrial and transportation, Retail and commerce.

Describe each one and give an example either from the spec or from the internet. Reference everything.

[Google Search: The Application Of IoT](#)

### A1 Purpose and applications of systems and services that make up the IoT

- Understanding that the purpose of systems and services that make up the IoT is to improve:
  - productivity, e.g. in manufacturing organisations by allowing the analysis of processes in real time and using historical data to reduce downtime and ensure product conformity
  - safety and security, e.g. in the home by allowing the monitoring of household systems remotely such as intruder alarms and providing connectivity with emergency services
  - efficiency and effectiveness, e.g. by enabling the monitoring and analysis of air and water
  - the experience and satisfaction of users by solving new and existing problems using technology, e.g. through the monitoring and control of heating systems.
- Understanding the application of IoT systems and services in different sectors:
  - home, including:
    - energy monitoring and control systems, e.g. Hive, Nest and smart meters
    - entertainment, e.g. motion tracking in video game controllers and mobile devices
  - health and wellbeing, including:
    - aiding and promoting good health, e.g. wearable devices
    - monitoring of vital signs, e.g. pacemakers, and heart rate monitors.
  - industrial and transportation, including:
    - machine control, e.g. to optimise machine performance in manufacturing
    - road tolling, e.g. the electronic road toll passes using automatic number plate recognition systems and radio frequency identification (RFID) technologies
  - retail and commerce, including:
    - tracking and tracing objects and people in the supply chain, e.g. order fulfilment and returns
    - advertisement and consumer involvement, e.g. beacons to promote awareness and nearables, e.g. Estimote Stickers.

## P2 - Explain the principles and characteristics of IoT systems and/or services from different sectors.

### Principles of IoT

#### **A2 Principles that underpin IoT systems and services**

Understanding the principles that underpin common IoT systems and services, including:

- the collection and analysis of data to trigger an action that results in a need being met
- a reliance on the existing internet and telecommunications infrastructure that allow IoT systems and service to operate
- access to and/or analysis of real-time data before it is transmitted back to the cloud or server
- access to and/or analysis of analogue data from the physical and natural world, e.g. light, sound, current, radio waves, humidity, vibrations, wind, video, pressure and time
- always-on connectivity that allows continuous monitoring of data from the physical world
- the spectrum of insight, covering the five-phase data flow in real time (in motion, early life, in rest and archive) and where data is processed at the point of collection in real time all the way to where archived data is used for modelling and analysis.

### Characteristics of IoT

#### **A3 Characteristics of systems and services that make up the IoT**

- Understanding the general characteristics of IoT systems and services:
  - risks, including security threats, e.g. hacking of connected cars allowing the intruder to operate a vehicle remotely and the extraction of names and financial account numbers from contactless payment services without authentication from the owner
  - ethical and privacy considerations, including public and professional attitudes, opinions and behaviours towards IoT and a reduction of low-skilled employment opportunities
  - legal considerations, e.g. use of data collected without consent, cybercrime and data protection
  - sustainability considerations, e.g. power requirements, recycling and reuse of components
  - benefits, including energy efficiency, e.g. transportation and in buildings, productivity gains, e.g. optimisation of processes in manufacturing, and agriculture, e.g. disease control and water use.
- Understanding the technical characteristics of IoT systems and services:
  - low mobility when a device has low or no mobility during its lifetime or mobility during a specific region. It often applies to systems and/or devices with specific functions, e.g. payment, metering, point-of-sale kiosks or remote maintenance
  - time controlled, where data is exchanged at certain pre-defined time periods and most applications have uses of time control
  - monitoring to detect events or actions rather than the security of the device
  - low power consumption, including extremely low consumption over long periods of time, infrequent user interactions and no constant power sources
  - location specific trigger, including waking the device in a specific area or location.

For each one simply explain in a little more detail. Give real world examples.

Principles is defined as..... ([Google Search: Define the word principle](#)).

Characteristics is defined as ..... ([Google Search: Define the word characteristics](#)). General and Technical.

Now you know the definitions you can combine them.

Steal from the specification or use google. Search criteria below.

[Google Search: Principles Of IoT](#)

## [Google Search: Characteristics Of IoT](#)

### IoT Principles

Principles of IoT can be described as..... (Ref it)

Some principle of IoT are: (list the ones from the spec, reword them to shorten or simplify)

- 1) The collection and analysis of data.
- 2) Reliance on the existing infrastructure.
- 3) Real time data.
- 4) Analogue data.
- 5) Always on connectivity.
- 6) Spectrum Of Insight.

I would go into more detail for each one. Expand and give examples where possible. This is definitely! cheating but do it.

### Data Collection and Data Analysis

What is it? Google Search: Define Data Collection.

Why is it important?

Give an example where possible.

### Reliance On Existing Infrastructure (Comms)

What is it?

Why is it important?

Give an example where possible.

### Real Time Data (RTOS)

What is it?

Why is it important?

Give an example where possible.

### Analogue Data

What is it?

Why is it important to IoT?

Give an example where possible.

### Always On Connectivity

What is it?

Why is it important to IoT?

Give an example where possible.

### Spectrum Of Insight?

What is it?

Why is it important?

Give an example where possible.

### [The Five Phases of an IoT Project](#)

[Google Search: Five phase data flow in real time.](#)

## IoT General Characteristics

Characteristics of IoT can be described as.....

Characteristics can be split into two subcategories: general characteristics and technical characteristics.

Some general characteristics of IoT systems and services are:

- 1) Risks.
- 2) Ethical and Privacy considerations.
- 3) Legal considerations.
- 4) Sustainability considerations.
- 5) Benefits?

I would go into more detail for each one. Expand and give examples where possible. This is definitely! cheating but do it.

### Risks

What is it and why is it important to consider?

Give an example if possible.

### Ethical and Privacy Considerations

What is it and why is it important to consider?

Give an example if possible.

### Legal Considerations

What is it and why is it important to consider?

Give an example if possible.

### Sustainability Considerations

What is it and why is it important to consider?

Give an example if possible.

### Benefits???

What is it and why is it important to consider?

Give an example if possible.

## IoT Technical Characteristics

Some technical characteristics of IoT are:

- 1) Low mobility.
- 2) Time controlled.
- 3) Monitoring.
- 4) Low power consumption.
- 5) Location specific trigger.

I would go into more detail for each one. Expand and give examples where possible. This is definitely! cheating but do it.

### Low Mobility

What is it and why is it important to consider?

Give an example if possible.

### Time Controlled

What is it and why is it important to consider?

Give an example if possible.

## Monitoring

What is it and why is it important to consider?

Give an example if possible.

## Low Power Consumption

What is it and why is it important to consider?

Give an example if possible.

## Location Specific Trigger

What is it and why is it important to consider?

Give an example if possible.

Steal from the specification or use google. Search criteria below.

[Google Search: Principles Of IoT](#)

[Google Search: Characteristics Of IoT](#)

## M1 - Compare the purpose, applications, principles and characteristics of IoT systems and/or services from different sectors.

There is nothing on the spec for M1 and D1.  
You must come up with this yourself.

Cover at least **4 different devices** used in **2 different sectors**. You should also cover the benefits and risks of each system.

What does it mean to compare?

Example of a comparison. Similar categories or headings. Numbers or descriptive information.

[Comparison Example](#)

Choose 2 sectors. Then choose the devices.

List Of Sectors From Spec: Home, Health and Wellbeing, Industrial and Transportation, Retail and Commerce.

List Of Sectors From Google: [IoT Sectors](#)

Sector 1: Home

Sector 2: Health and Wellbeing

Why these two?

I know them relatively well.

I like these sectors.

Choose what you know and what you like.

Sector 1: Home

Device 1: Google Home/Google Nest Mini

Device 2: Amazon Alexa

Sector 2: Health and Wellbeing

Device 1: Google Pixel Watch

Device 2: Apple Watch

Give a "short" introduction for each one.

The sectors I have chosen are: "x" and "y".

I chose "x" and "y" because.....

From category "x" I will be comparing the Google Pixel Watch and the Apple Watch. These devices are both smart watches.

From category "y" I will be comparing the Google Home Mini and the Amazon Alexa. These devices are both smart home devices that help users with automation and monitoring.

Factors to use for comparison: purpose, application, principles and characteristics.

Purpose	Productivity, safety and security, efficiency and effectiveness, user experience and satisfaction.
Application	Home, health and wellbeing, Industrial and transportation, Retail and commerce.
Principles	<a href="#">Go to P2 Principles Of IoT.</a>
Characteristics	<a href="#">Go to P2 Characteristics Of IoT.</a>

## Sector 1: Home

Device 1: Google Home/Google Nest Mini

Device 2: Amazon Alexa

I would investigate some of the things that people care about when looking at these devices.

For me it was: sound quality, design, voice assistant, smart home integration, connectivity, buttons, music playback, colour and price.

	Google Home/Nest Mini 2	Amazon Alexa
Sound Quality		
Design		
Voice Assistant		
Smart Home Integration		
Connectivity		
Buttons		
Music Playback		
Colours		
Price		
Always On Capability		
Power Consumption		
Mobility	Low, must be plugged in.	Low, must be plugged in.

## Sector 2: Health and Wellbeing

Device 1: Google Pixel Watch

Device 2: Apple Watch

I would investigate some of the things that people care about when looking at these devices.

For me it would be: price, colours, changeable straps, charging connector, OS, battery life, fitness tracking, app usability, display size, display brightness, interactivity (touch or button) and eco system (Android only/IOS only/both?).

	Google Pixel Watch	Apple Watch
Price		
Colours		
Changeable Straps		
Charging Connector		
Operating System		
Battery Life		
Fitness Tracking/Activity Tracking		
App Usability Rating		
Display Size		
Screen Brightness		
Interactivity (touch or button)		
Eco System Integration		
Sensors		
Storage		
RAM		
Processor		

## D1 - Evaluate the purpose, applications, principles and characteristics of IoT systems and/or services from different sectors.

What does the term evaluate/evaluation mean?

Google Search: [What does evaluation mean?](#)

Google Search: [How to write an evaluation?](#)

Google Search: [Examples of evaluations report.](#)

Essentially the benefits and drawbacks of IoT.

There were some pointers on the spec that we can use as well.

Google Search: [Benefits and drawbacks of IoT.](#)

### Benefits

Improved efficiency and productivity.

How, give example if possible.

Cost Savings

How, give example if possible.

Improved safety and security

How, give example if possible.

Personalised experiences.

How, give examples if possible.

### Drawbacks/Disadvantages

Security Risks

How, give example if possible.

Privacy

How, give example if possible.

Complexity

How, give example if possible.

Always on Devices

How, give example if possible.

### Final Statements

With all that was said, is it worth doing or not doing in your opinion.

If worth doing, say why, maybe does more good than bad.

If not worth doing, say why, maybe does bad than good.

## References

Name Of Article: Raspberry Pi Pico

Date: 03.06.2023.

Link: <https://www.raspberrypi.com/products/raspberry-pi-pico/>

[Link To Information](#)

## Order Of Criteria.

P3 - Produce an IoT system or device design to solve a problem, including the architecture, standards, communication requirements and security.

P4 - Review the IoT system or device design with others to identify and inform improvements.

M2 - Justify design decisions, showing how the system or device design will result in an effective IoT system or service solution.

P5 - Develop a prototype IoT system or device with partial functionality to solve a problem.

P6 - Review the extent to which the IoT system or device meets the client's requirements.

M3 - Develop a functional prototype IoT system or device to solve a problem as intended and that meets the client's requirements.

D2 - Evaluate an optimised IoT system or device design to solve a problem against the client's requirements and using feedback from others. **PS:** This can come after M2 as well.

D3 - Optimise the prototype IoT system or device to solve a problem as intended and that meets the client's requirements, demonstrating individual responsibility and effective self-management.

## Pre P3

Before we can design, we must know what we are designing for.

We must read the scenario.

## Scenario

You have recently started work as an IT technician in the technical department of a small company that specialises in security systems and burglar alarms. The director of the company is interested in investigating if the company could make use of IoT technologies in its products and services and your manager has asked you to develop a prototype system which uses this technology.

The problem that the directors are keen to solve is that their current alarms simply ring an alarm bell when they detect an intruder. They would like the alarms to be able to notify the home owner when an intruder is detected.

## Specification

We need to come up with a Specification.

Define the term specification.

[Google Search: How to write a technical specification.](#)

I would keep it simple, make a list of all the things.

My Example Specification

Notify home owners.

Detect movement.

Ring bell or buzzer.

## Purpose and Scope Of The System

Normally we would need to speak to the client to get this.

We have been given this on the assignment brief.

## Requirements, Specification and Justification

What is required?

What are we going to give or try to give?

Why each option was chosen?

## My Example

Your manager has asked you to develop a prototype system which uses this technology.

The problem that the directors are keen to solve is that their current alarms simply ring an alarm bell when they detect an intruder. They would like the alarms to be able to notify the home owner when an intruder is detected.

Requirements	Spec	Justification
Detect movement	Motion Sensor (PIR)	

	Ultrasonic Distance Sensor	
	Laser E and Laser Re	
Make audible thing	Buzzer	
	Speaker	
Make visual notification	LEDs	
	Flash Light	
Notify home owners	Email	
	App	
	Text	

## Disclaimer

**Overall your work needs to be easy to read by a third party, logically structured with appropriate use of technical language and a high standard of written English throughout.**

Provide evidence that you have demonstrated effective self-management (for example by planning your time effectively) and taken individual responsibility (for example by dealing with problems you encountered) while working on this assignment.

This is silly to have at the end.

## Project Management.

What is it and why is it important?

Types of project management (simplest way to explain).

[Google Search: Types of Project Management.](#)

Waterfall project management. ...

Agile project management. ...

Scrum project management. ...

Kanban project management. ...

Lean project management. ...

Six Sigma project management. ...

PRINCE2 project management.

Which one will you use and why?

Some agile variant.

Easy to make changes and as when you need to.

First time programming you are likely to make mistakes and want the ability to improve where possible.

## P3 - Produce an IoT system or device design to solve a problem, including the architecture, standards, communication requirements and security.

Define each term.

Google Search: What does architecture mean in IoT?

Google Search: What are standards in IoT?

Google Search: What are communication requirements in IoT?

Google Search: What does security mean in IoT?

### Architecture

- The architecture, including M2M system and device architecture (sensors, wired/wireless communications, actuators, and device, network and application domains).

Device Name: Raspberry Pi Pico W or ESP32 Wi-Fi. Give some specs here of your chosen device.

133Mhz x 2

Sensors: Motion Sensor or Ultrasonic Sensor or Laser Emitter and Receiver etc (these will be analogue and be converted to digital).

Communication: WiFi, Bluetooth (Normal and LE), GPRS, 4G/5G.

Network Domain: LAN and WAN.

### Standards

- Standards, including M2M interfaces and reference frameworks.

ISO/IEC 27400.

A newly released comprehensive standard that provides guidelines on risks, principles, and controls for the security and privacy of Internet of Things (IoT) solutions.

Have the risks been considered, if so, how have they been mitigated?

Has privacy been considered, if so, how and how has this been mitigated?

### Communication Requirements

- communication requirements including system and device communication principles and capabilities, identification and location of secured network components.

Always on device connected to WiFi once activated.

Messages will only be sent once activity has been detected, it is not scheduled but instantaneous.

Message priority will always be set to high.

Messages will be text message and/or email.

A text file logging date and time of each activation.

IP V4 protocol will be used.

## Security

- security of the system including potential security threats, remote management, effects of attacks and security protection methods.

System will be unmanned.

Tampering or hacking is possible.

Remote management not possible using this microcontroller.

If network attacked device will not be able to transmit but will still have visual and audio capabilities.

Encrypted emails by default, will only be sent to registered email addresses.

Text messages will only be sent to registered numbers.

## Describe System Functionality

The system will only be activated at specific times or when the homeowners are not at home.

The system will have a motion sensor connected.

The sensor will poll at set intervals of x seconds.

If no movement is detected the system will simply continue to poll.

No buzzer sound.

No LED flash.

No email or text message sent.

If movement is detected, the system will keep polling and do the following.

Sound the buzzer.

Flash the LEDs.

Send an email and text message to the homeowner.

## Components

Hardware	Software
Raspberry Pi Pico W, ESP32, Arduino, Arduino R4.	Thonny IDE.
1 x Micro USB Cable.	MicroPython or CircuitPython.
2 x LEDs (one green, one red).	
2 x 330 Ohm Resistors (Orange, orange, brown, gold <b>OR</b>	

orange, black, black gold).	
1 x HC-SR501 Motion Sensor (PIR).	
Some jumper wires.	
1 x Breadboard.	
A computer (Windows, MAC or Linux) with USB Port.	
1 x Active buzzer.	

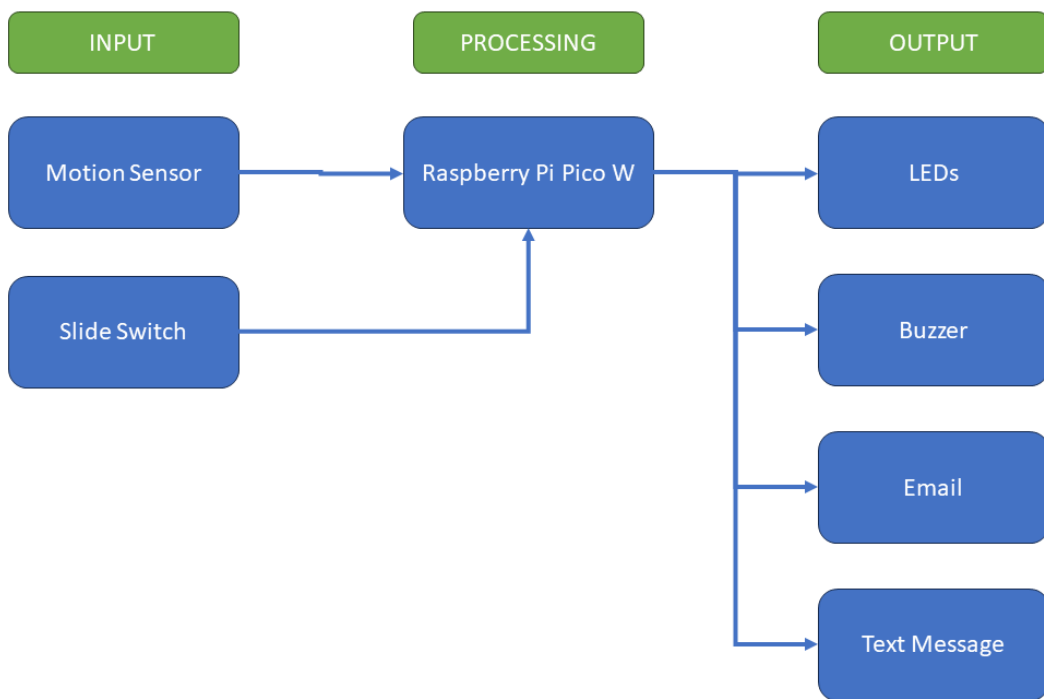
### Block Diagram

What is it and why use it?

[Google Search: Block Diagram.](#)

Use PowerPoint or any diagram tool. I used "<https://app.diagrams.net/>".

**I am going make a mistake somewhere.**



### Pseudocode

What is it and why use it?

[Google Search: Pseudocode.](#)

[Pseudocode: BBC Bitesize.](#)

**I am going make a mistake somewhere.**

WHILE TRUE – Once there is power.

INPUT – Check the value of the switch.

IF switch is 0 or off:

RETURN – Go back to main loop.

IF switch is 1 or on:

INPUT – Check the value of the motion sensor.

IF – Motion sensor value is 0 or off or **no** motion:

RETURN – Go back to main loop.

IF - Motion sensor value is 1 or on or there **is** motion:

OUTPUT – Flash LEDs.

OUTPUT – Sound buzzer.

OUTPUT – Send email.

OUTPUT – Send text message.

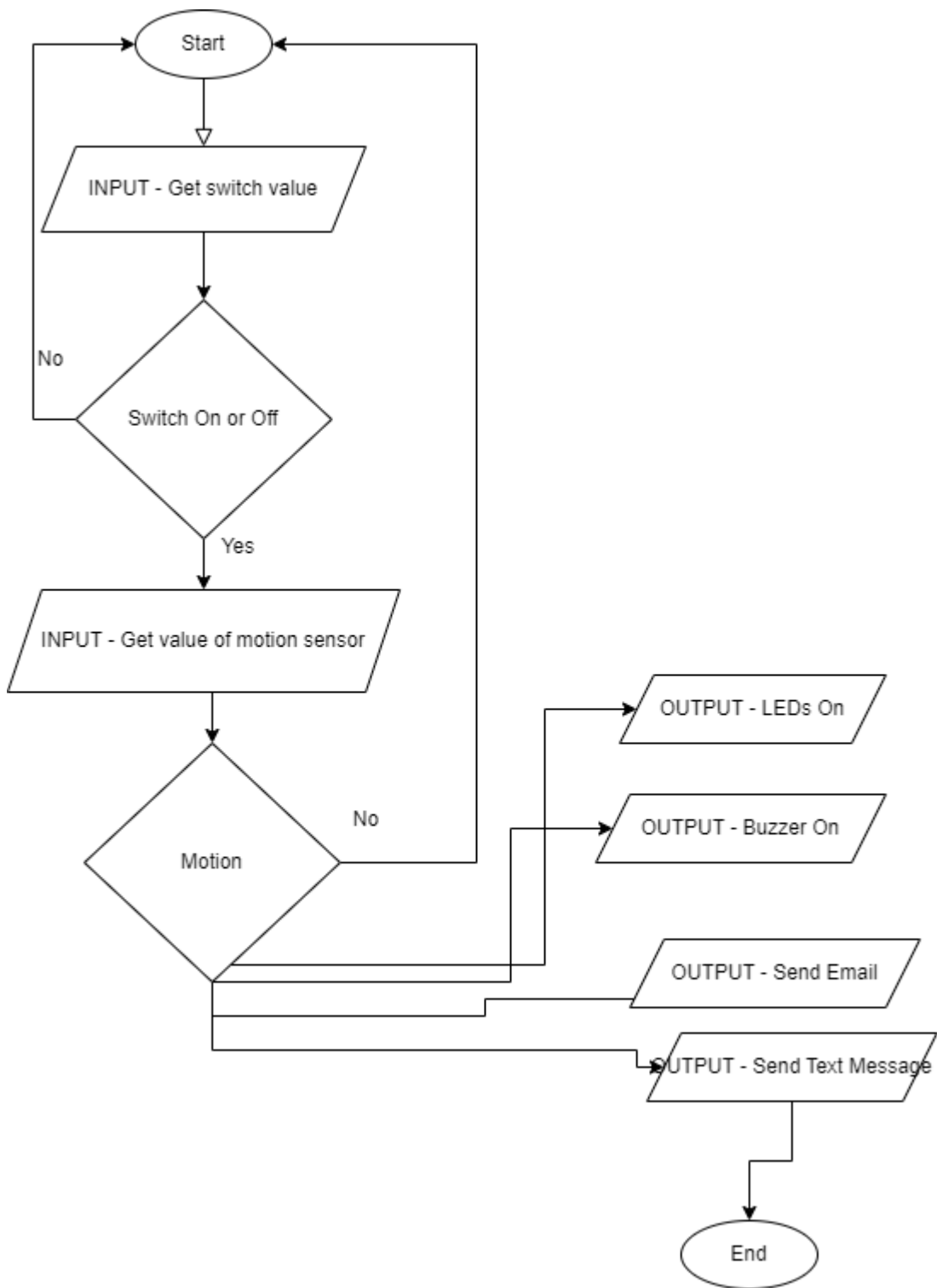
## Flowchart

What is it and why use it?

[Google Search: Flowchart.](#)

[Flowcharts: BBC Bitesize.](#)

**I am going make a mistake somewhere.**

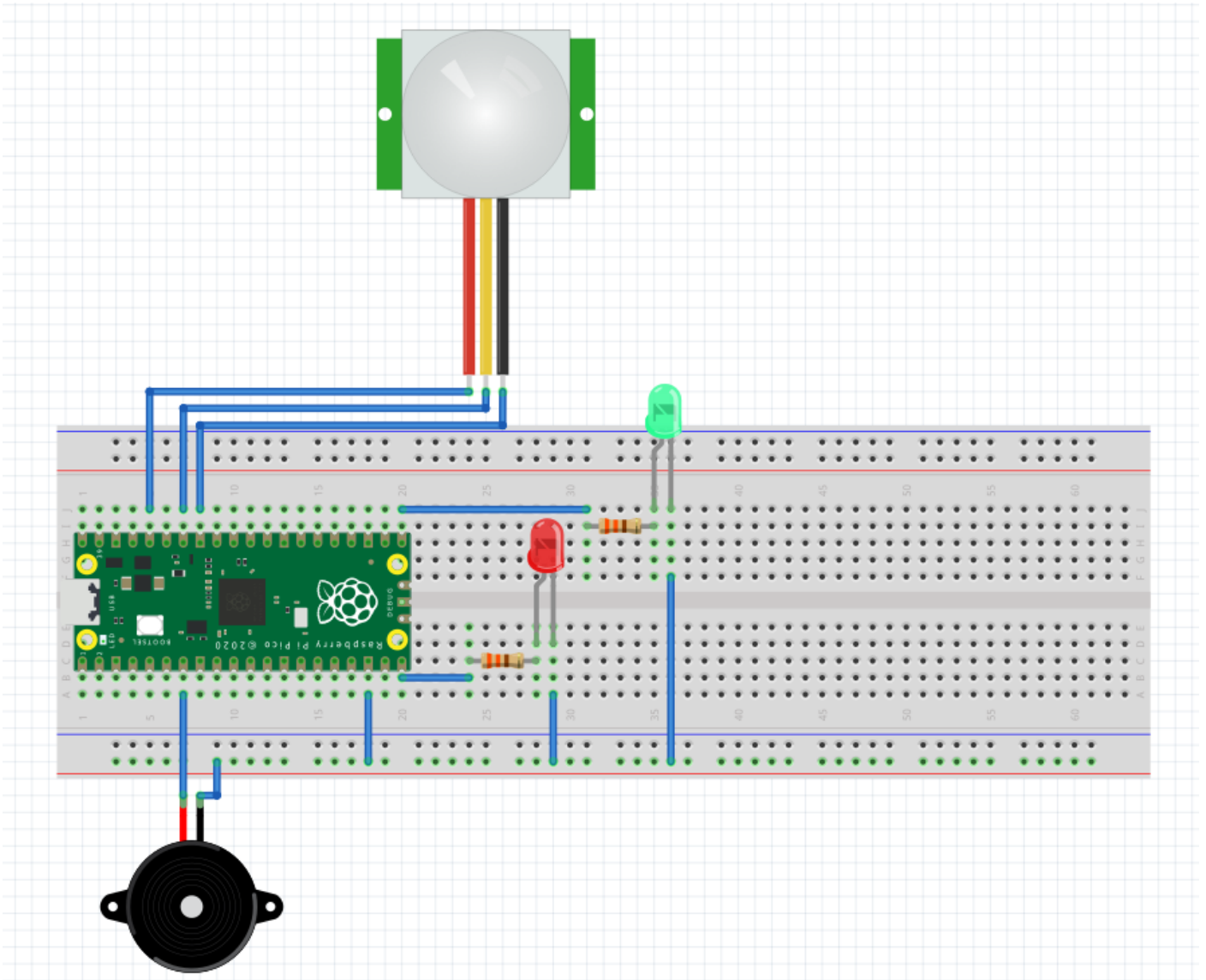


## Circuit Diagram

What is it and why use it?

I will be using Fritzing for this.

**I am going make a mistake somewhere.**



### PIR To Pi Pico

Red wire to Pin 36 (3.3V)

Data wire (yellow) to Pin 34 (GP28)

Ground (black wire) to Pin 33

### Buzzer to Pi Pico

Red wire to pin 7 (GP5)

Black wire to ground

Red LED to Pi Pico

Resistor to Anode to Pin 20 (GP15)

Cathode to ground

Green LED to Pi Pico

Resistor to Anode to Pin 21 (GP16)

Cathode to ground

## P4 - Review the IoT system or device design with others to identify and inform improvements.

### From The Assignment Brief

Review the design with at least two other people to help you make improvements and create a second optimised version of the design annotated to show the improvements you have made following the feedback.

The designs done were:

Block diagram, Pseudocode, Flowchart and Circuit Diagram

I asked peers to review the designs in order for me to identify where improvements can be made. Minimum 2.

This is why I left a mistake in. You do NOT need to do this.

### Person 01 Review

Design	Comments
Block Diagram	
Pseudocode	
Flowchart	
Circuit Diagram	

### Person 02 Review

Design	Comments
Block Diagram	
Pseudocode	
Flowchart	
Circuit Diagram	

### Person 03 Review

Design	Comments
Block Diagram	
Pseudocode	
Flowchart	
Circuit Diagram	

### Own Review

Design	Comments
Block Diagram	
Pseudocode	
Flowchart	
Circuit Diagram	

## Design Improvements

This section was designed to identify improvements. I will only focus on the comments which made suggestion on what can be improved. The improvements I will make will be indicated agree box.

Comments	Agree or Disagree
A was good	Agree
B was bad	Dis
C was okay	Dis
D needs a lot of work	Agree
	Agree

Block Diagram Version 2

Pseudocode Version 2

Flowchart Version 2

Circuit Diagram Version 2

## M2 - Justify design decisions, showing how the system or device design will result in an effective IoT system or service solution.

### From The Assignment Brief

Write a justification of the decisions you made in the design you have created, showing how they will help to create an effective IoT solution.

Go over again what an effective solution would be.

A system that does the following:

Always on.

Detects when switch is on and off.

When the switch is on, checks for motion.

If and when motion is detected the system should:

Flash LEDs, sound buzzer and notify the homeowner via text and email.

Why Motion Sensor why this instead of other options.

Wide area of coverage vs ultrasonic sensor.

Why Active Buzzer instead of other options.

Cheap, easy to use in Python. No need for oscillators, libraries or components needed to operate it.

Why LEDs instead of other options.

Cheap and easy to implement. Can be fully operated using the power from the Raspberry Pi. Alternating colours would be just as visible as other options such as a siren light.

Why email and text messages instead of other options.

Both free and easy to use and implement. Making an app would be ideal as these can offer push notifications. The app would however take a very long time develop adding unnecessary complexity.

P5 - Develop a prototype IoT system or device with partial functionality to solve a problem.

M3 - Develop a functional prototype IoT system or device to solve a problem as intended and that meets the client's requirements.

#### From The Assignment Brief

Develop an optimised and functional prototype of the system and test the system to show that it meets the requirements. This should include:

- Connected and normalised M2M operations
- Device management
- Use of a database for device data
- Processing and action management
- A visualised dashboard
- Programming techniques and constructs such as the use of a software development environment, hardware device set up and visual and non-visual programming constructs

Use of IoT analytics

Follow your circuit diagram version 2 to build the system.

Then simply program it. I would do a section at a time showing all the steps. Like a mini Log Book.

#### Step 01 – Assemble LED Circuit

What?

Why?

How/Code

Picture/Screenshot

Comments

#### Step 02 – Add Buzzer to Circuit

#### Step 03 – Send Email

#### Step 04 – Send Text Message

#### Step 05 – Add Motion Sensor to Circuit

#### Step 06 – Combine Motion Sensor and LEDs

Step 07 – Combine Motion Sensor, LEDs and Buzzer

Step 08 – Add Email to Combination

Step 09 – Add Text Message to Combination

Step 10 – Final Actual System

P6 - Review the extent to which the IoT system or device meets the client's requirements.

D2 - Evaluate an optimised IoT system "or" device design to solve a problem against the client's requirements and using feedback from others.

### From The Assignment Brief

Write an evaluation of both the design, which you optimised using feedback, "and" the completed prototype system. You should consider a comprehensive range of risks and benefits of the system and also review security, legal and sustainability issues. Your evaluation should also reflect on your own performance during the design and development of the system.

### Original Requirements

Requirement	Completed or Not
Detect movement or entry.	Yes, completed
Sound buzzer	Yes
Flash LEDs	Yes
Send email	Yes
Send text message	Yes
Always be on	Yes

### Person 01 Review

You left out the switch to turn the system on and off.

### Person 02 Review

The circuit is a bit messy.

### Person 03 Review

The circuit could be a bit more neat.

### Own Review

Your own comments. You look over your code and make changes you think are relevant.

Fix python file from only running once.

### Implementation Improvements

Comments	Agree or Disagree
You left out the switch to turn the system on and off.	Agree
The circuit is a bit messy.	Disagree
Fix python file from only running once.	Agree

### Optimised Program Version 2

Things to action:

Add switch

Fix file calling another file



### D3 - Optimise the prototype IoT system or device to solve a problem as intended and that meets the client's requirements, demonstrating individual responsibility and effective self-management.

The original requirements were:

What was done? vs What was "not" done?

Why were things not done?

Show Gantt Chart/Time Plan

Did you follow it?

If not say what was changed and why it was changed.

What went well?

What did not go well?

What could be improved or what would you add later on.

- Provide evidence that you have demonstrated effective self-management (for example by planning your time effectively)
- 
- and
- 
- taken individual responsibility (for example by dealing with problems you encountered) while working on this assignment