INTERNET OF THINGS

EVERYTHING THAT CAN BE AUTOMATED,

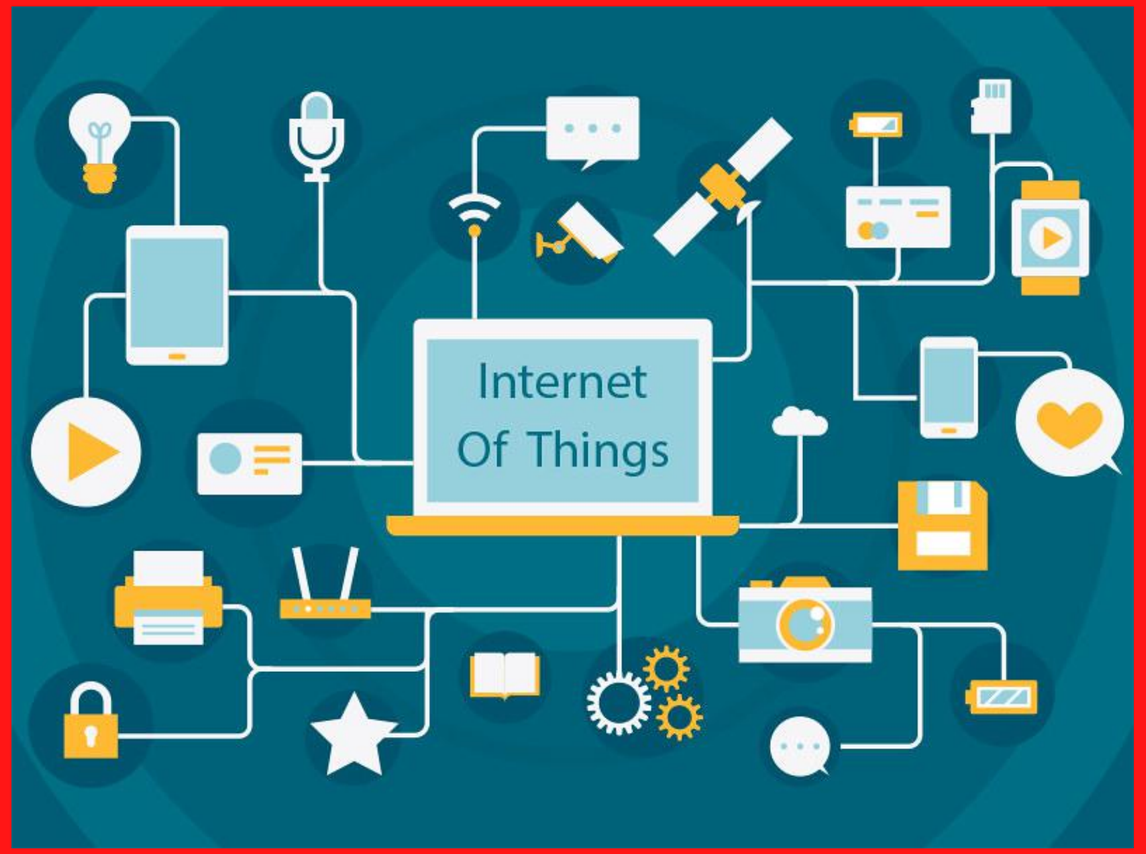
WILL BE AUTOMATED

From the development to the networking

THE OBJECT, THE NETWORK & THE COMMUNICATION

?

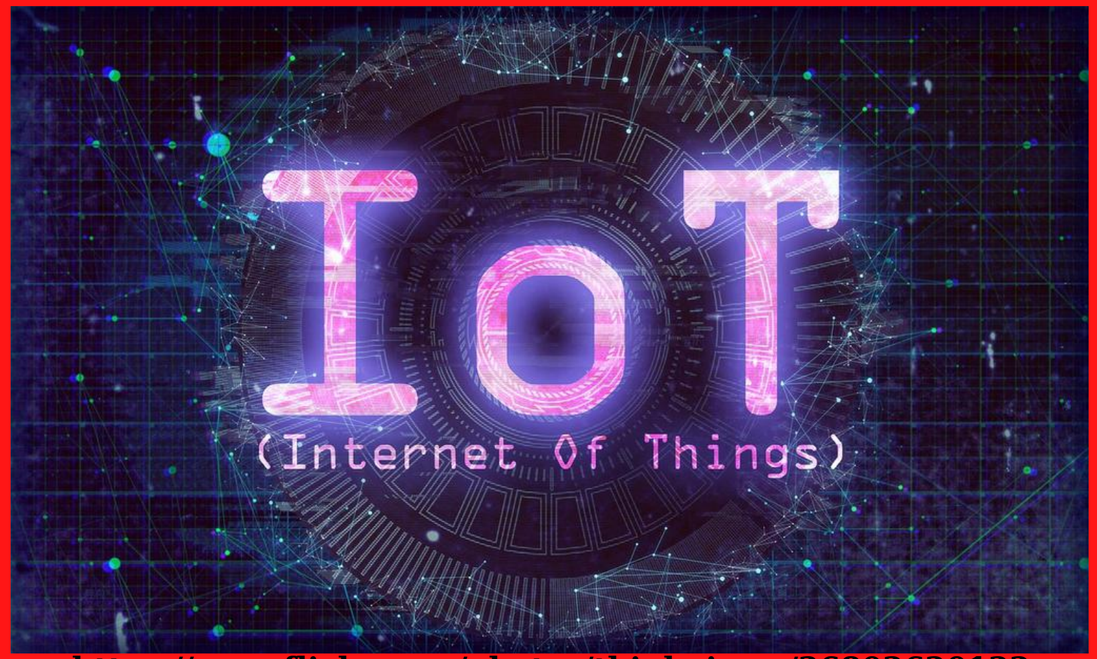
What is an IoT system?



https://www.flickr.com/photos/thinkgizmo/36802620122

What is an IoT system ?

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.



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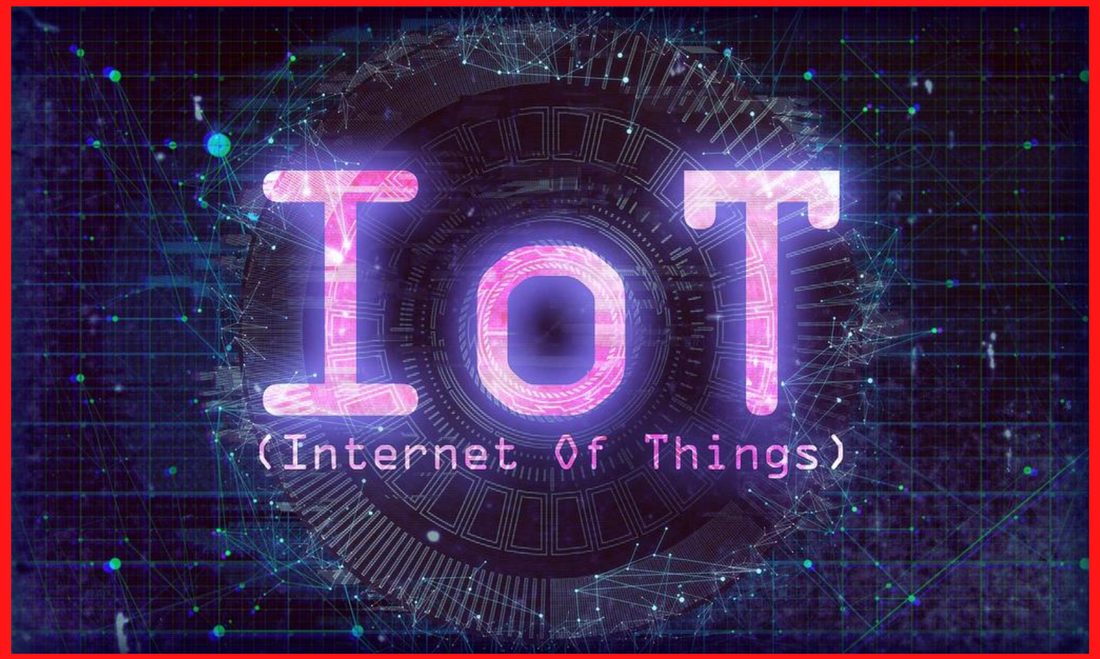
History

1982

The first time that the term IoT used,was for a Coca Cola vending machine, which was connected to the Internet. This vending machine provided information about the temperature to the University of Carnegie Mellon.

1999

IoT term officialy appeared form Kevin Ashton



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How an IoT system works?

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5

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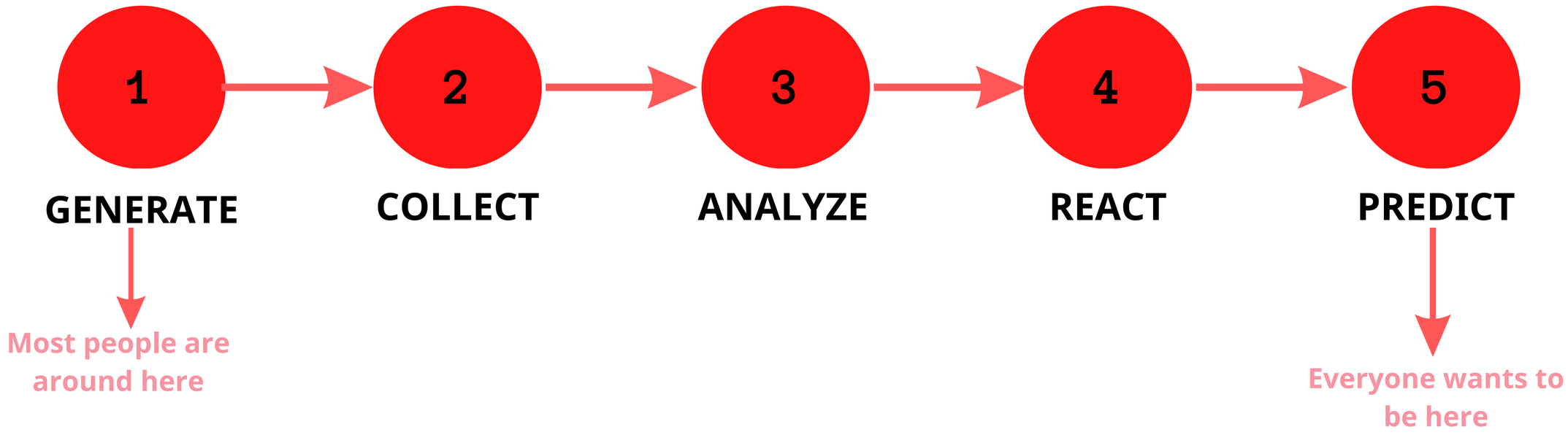
4. There the information is parametrized and we get the results, with the processing of these deals with the Data Science.

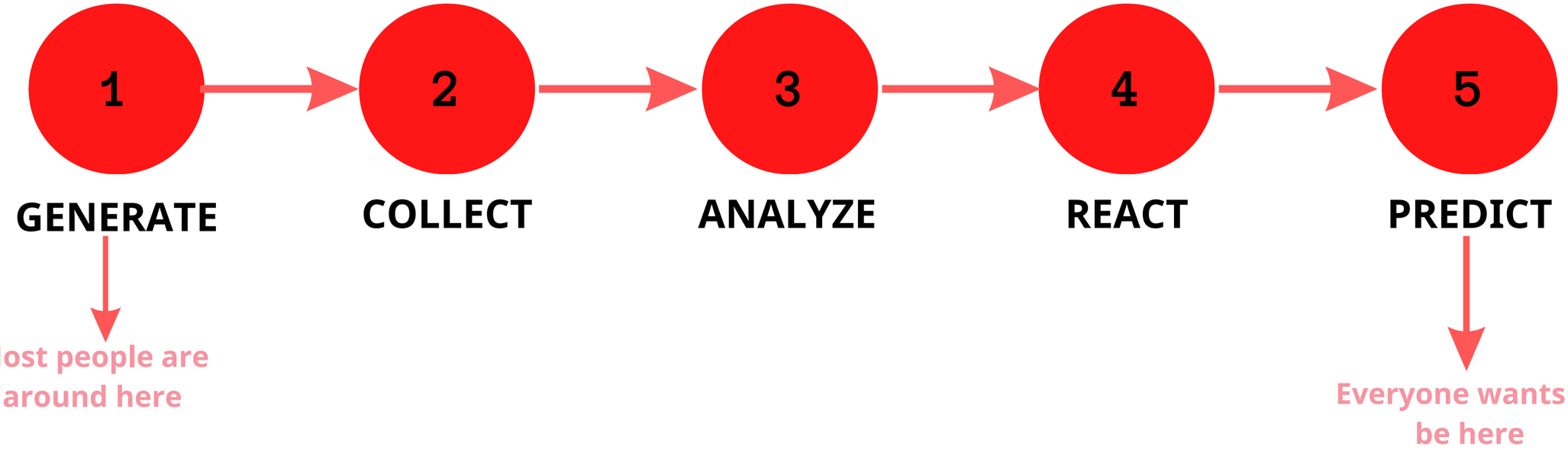
5. The results are shared among the other devices, that are connected to the same network for collaborated use and analysis, **automated processes**, and improved operations.

THE INTERNET OF THINGS LIFECYCLE



Collect Communicate Analyze React

THE INTERNET OF THINGS LIFECYCLE



Collect

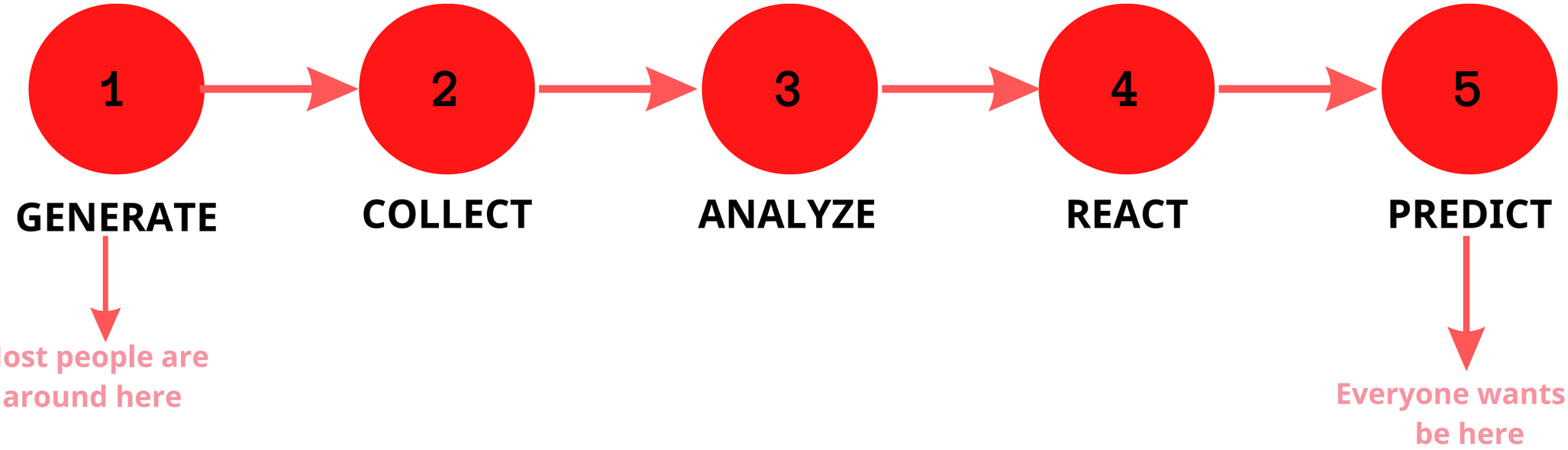
Sensors collect data from everywhere, eg the car, the house, the school

Communicate

Analyze

React

THE INTERNET OF THINGS LIFECYCLE



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Data and events are sent over a network to a destination, eg cloud, home network

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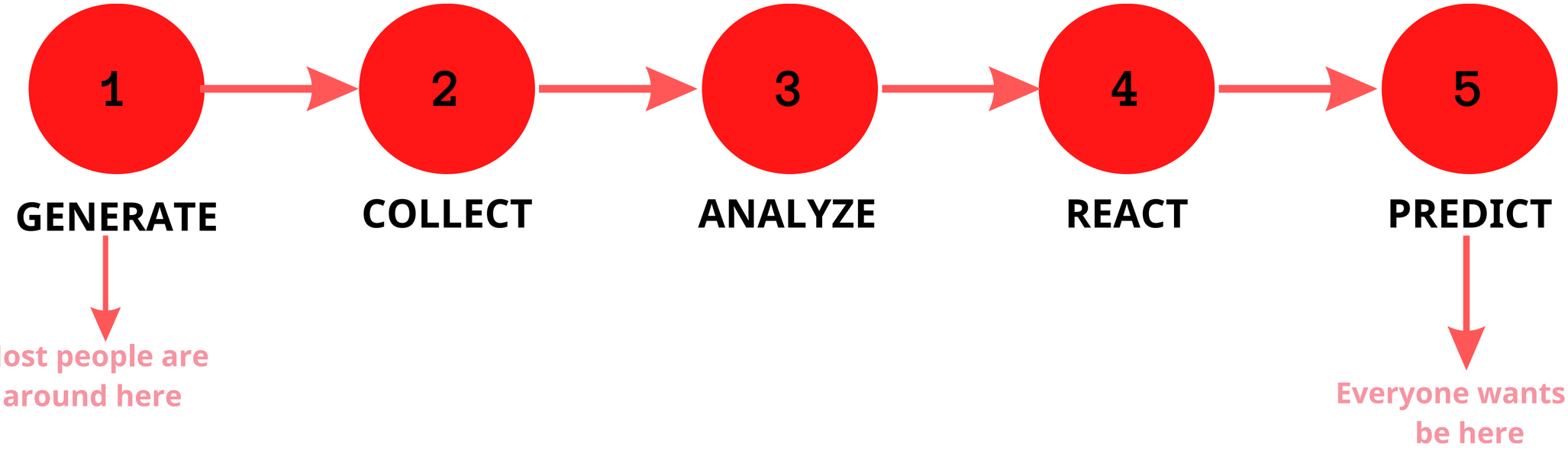

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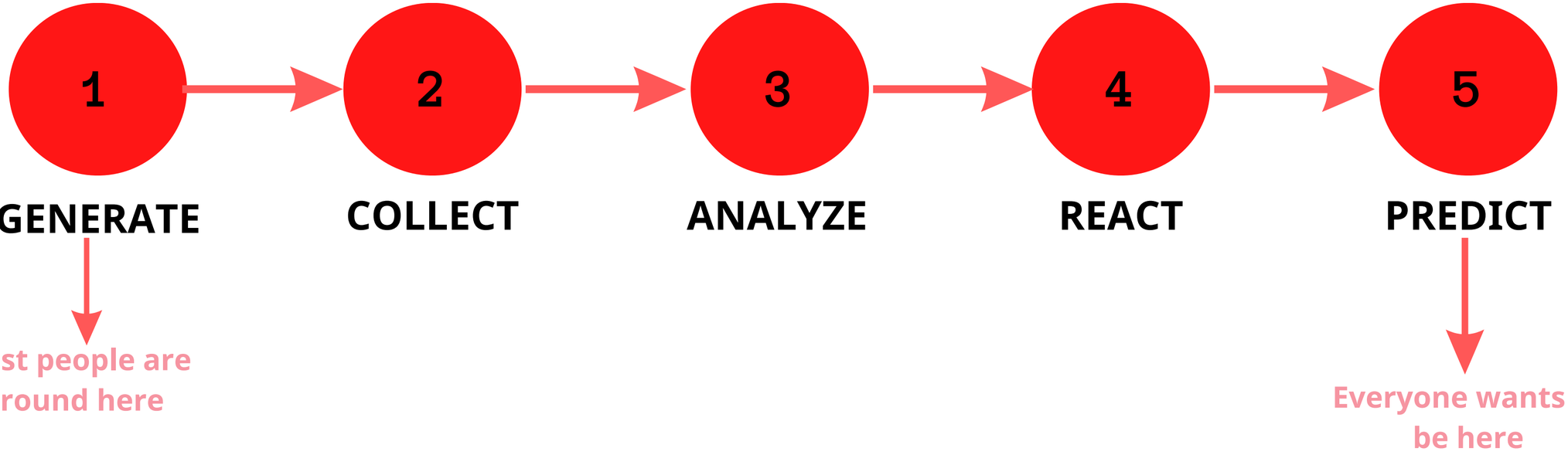

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We act on the basis of the information and Data, for example communication with another device, sending an email or message

Examples

IoT has great utility in the daily life of the average consumer, in the field of medical care, in commerce, but also in the production process

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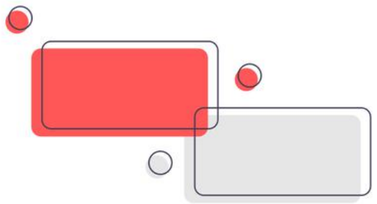

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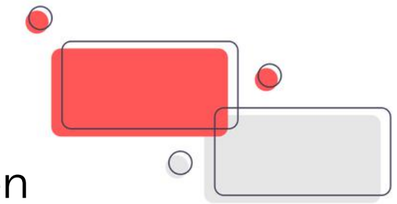
1. Smarthomes & automation
2. Security - Security systems
3. Wearables - Smartwatch - Fitwatch - Trackers
4. Network that creates interaction relationships between vehicles and traffic (Telematics)
5. Smartfarming

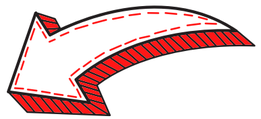


Example: Traffic Camera

https://pixabay.com/vectors/silhouette-security-cam-speed-3636336/

- The camera can check the road for traffic jams, accidents, or even weather.
- It sends the data and combines it with the data of other cameras installed in a city or on a main street.
- It thus creates an "intelligent traffic control system".
- Let's say that this system "senses" that there is a traffic jam due to an accident.
- This information helps the system calculate a faster and safer route around the accident and sends it to the navigation systems to make it easier for all drivers.

Iot Benefits



EFFICIENCY

An IoT environment enables operational efficiency because we can interact with the environment, quickly and easily. We can monitor and manage the objects through connected systems in the network.

Iot Benefits

PRODUCTIVITY

By analyzing data collected from sensors, we create solutions that improve productivity, avoid costly unplanned downtime and reduce production/ operational costs.

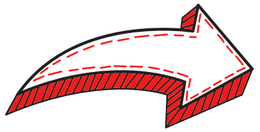
Iot Benefits

SECURITY

By using IoT and automation we achieve the reduction of exposure to hazardous environments and the reduction of errors

Iot Benefits

BENEFITS



ENVIROMENT

Sensors collect data from the environment, so we can analyze and predict scenarios about the environment

PROS

- Ability to access information from anywhere and at any time on any device
- Improved communication between connected electronic devices
- Transfer data over a connected network saving time and money
- Automating tasks by helping to improve the quality of a business's services and reducing the need for human intervention

CONS

PROS

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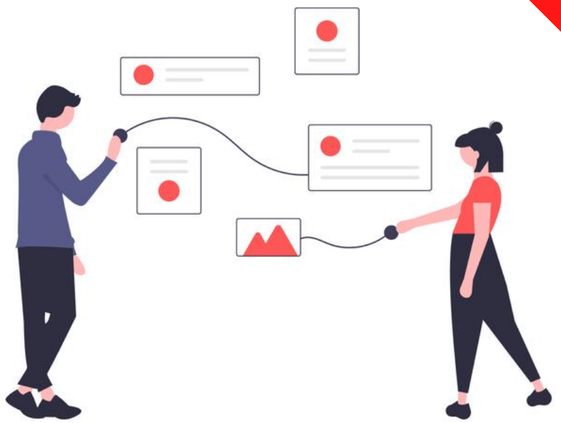
CONS

- As the number of connected devices increases and more information is shared between devices, the potential for someone to steal confidential information also increases.
- Businesses may eventually have to deal with huge numbers -- perhaps even millions -- of IoT devices, and collecting and managing the data from all these devices will be difficult
- If there is an error in the system, it is possible that every connected device will experience a problem
- Since there is no international compatibility standard for IoT, it is difficult for devices from different manufacturers to communicate with each other



1rst level: Networks

Wifi

Ethernet

Cellular

2nd: Protocolls

LoRaWAN

AMQP

ZigBEE

MQTT

Sigfox

2o level:Protocols

1

LORAWAN

Low power wide area network designed to enable long-range communications (20-40km)

2

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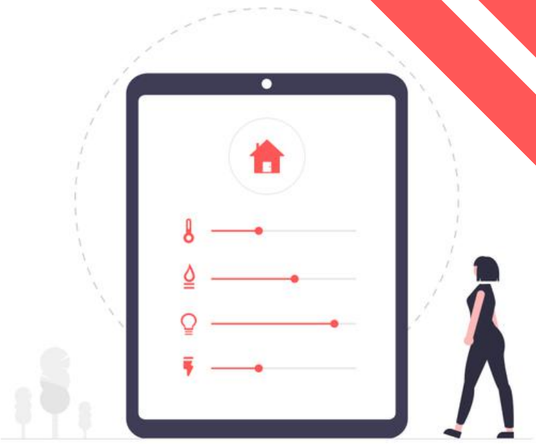

2o level:Protocols

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ZIGBEE

It is used to create personal area networks with low-power small frequencies

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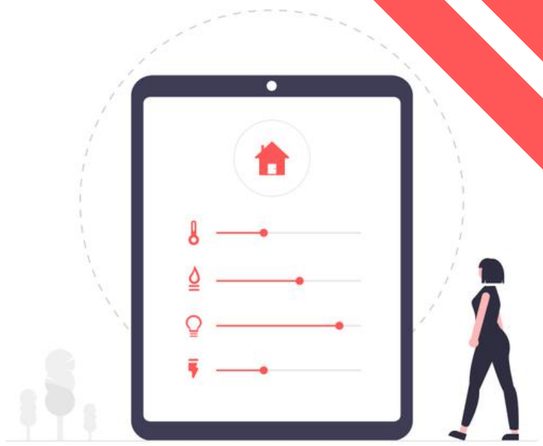

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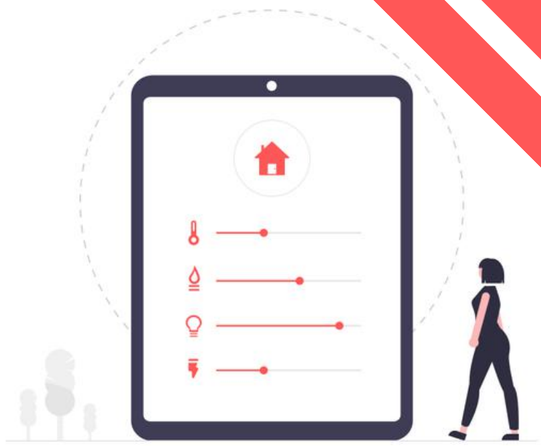

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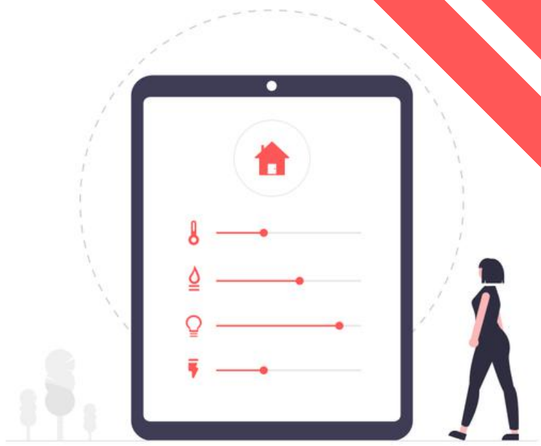

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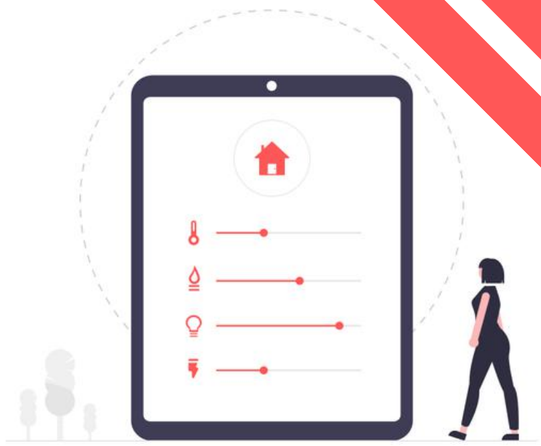
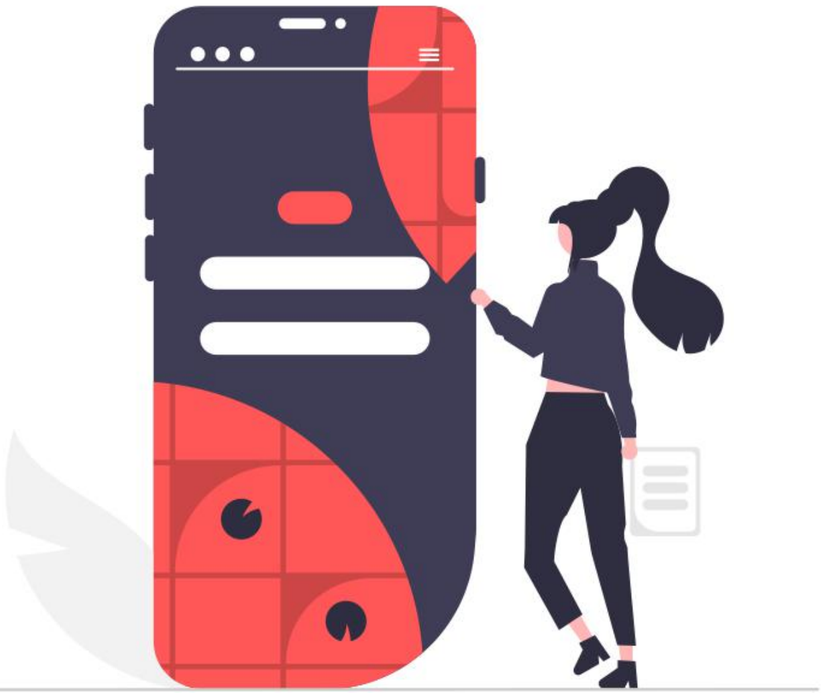
5 **MQTT**

MQ Telemetry Transporter is an object-to-object network protocol for transporting data/messages



The platform

FROM COLLECTION TO VISUALISATION

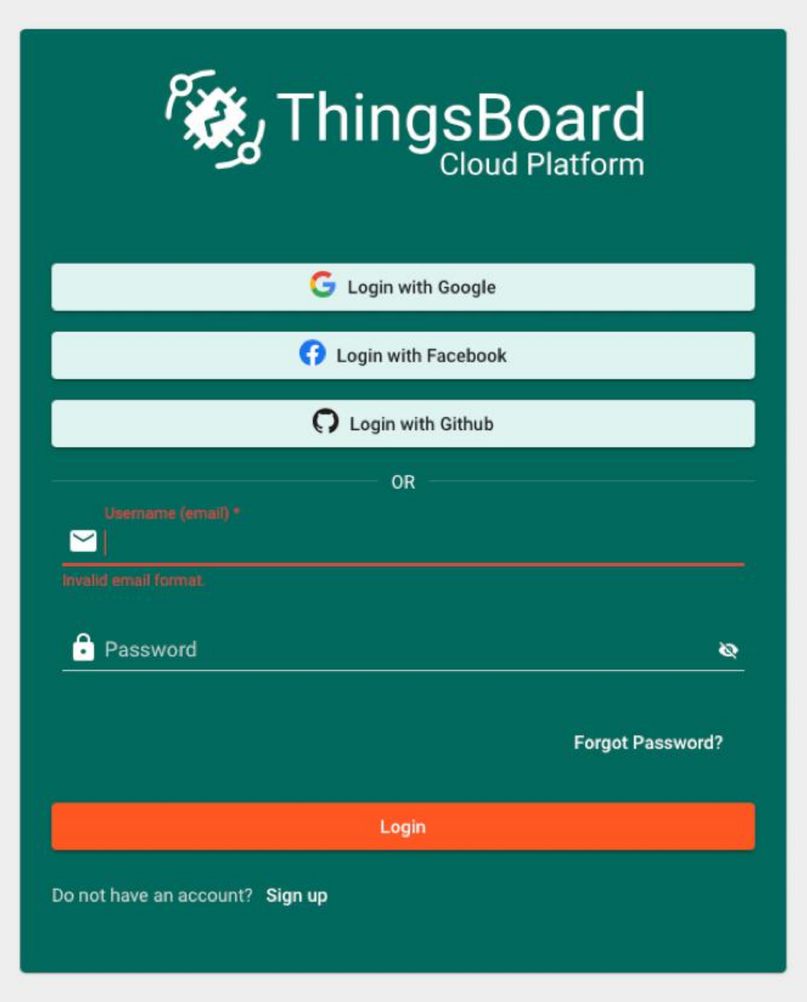


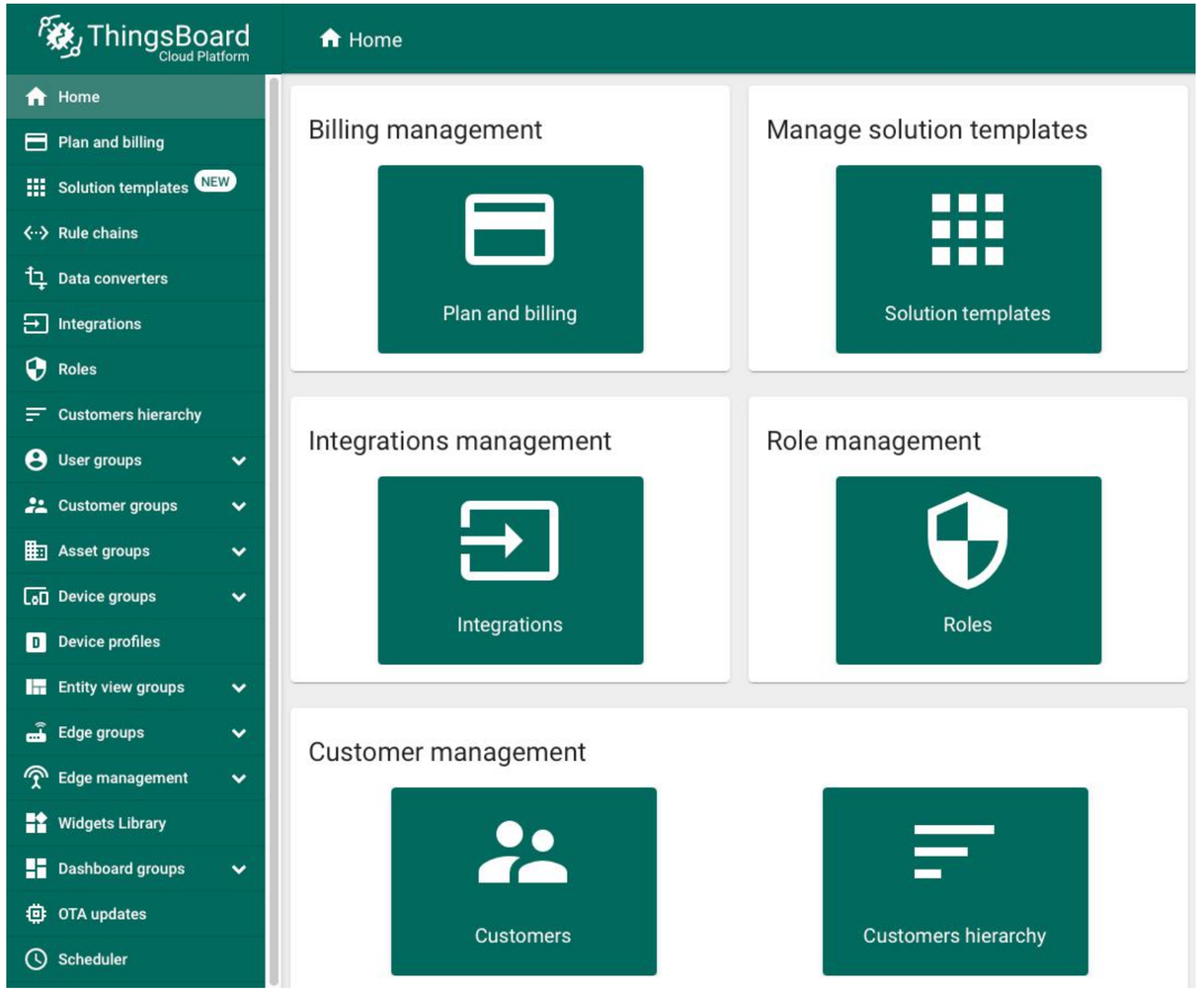
ThingsBoard

Thingsboard is a Low Code IoT plattform for multiple uses, that doesn't acquire programming skills and requires no programming skills and minimal time to implement custom applications, analytics and visualization models.

URL: **demo.thingsboard.io**

ThingsBoard





waterline

The Waterline project concerns new solutions and technologies for communication and sharing of Hydrological Study and Forecast data based on IoT technologies

URL: **waterlinedata.eu**

QUESTIONS

SCIENTIX
The community for science education in Europe
CISCO
STE(A)M PARTNERSHIPS
Education Resilience in Europe
European Schoolnet
SCIENTIX