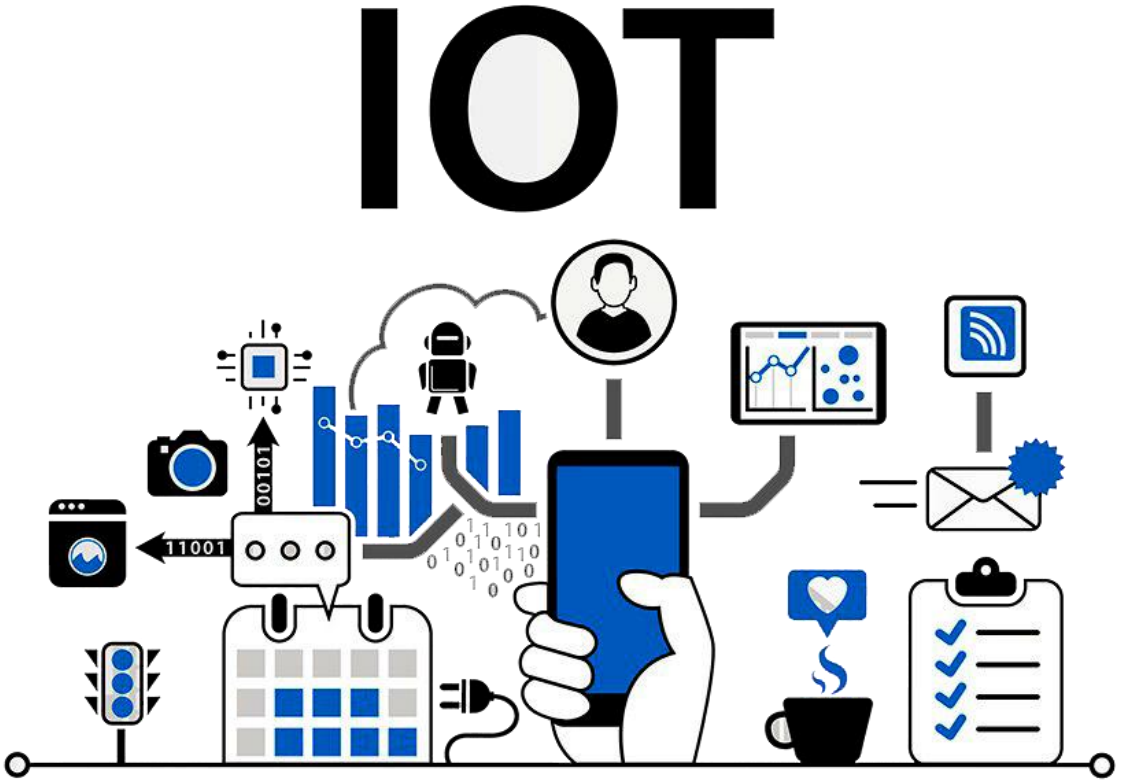
Internet of Things

Dr. Mostafa Ibrahim El- Khalil

2025



Lecture 1

Students Book

Google Classroom

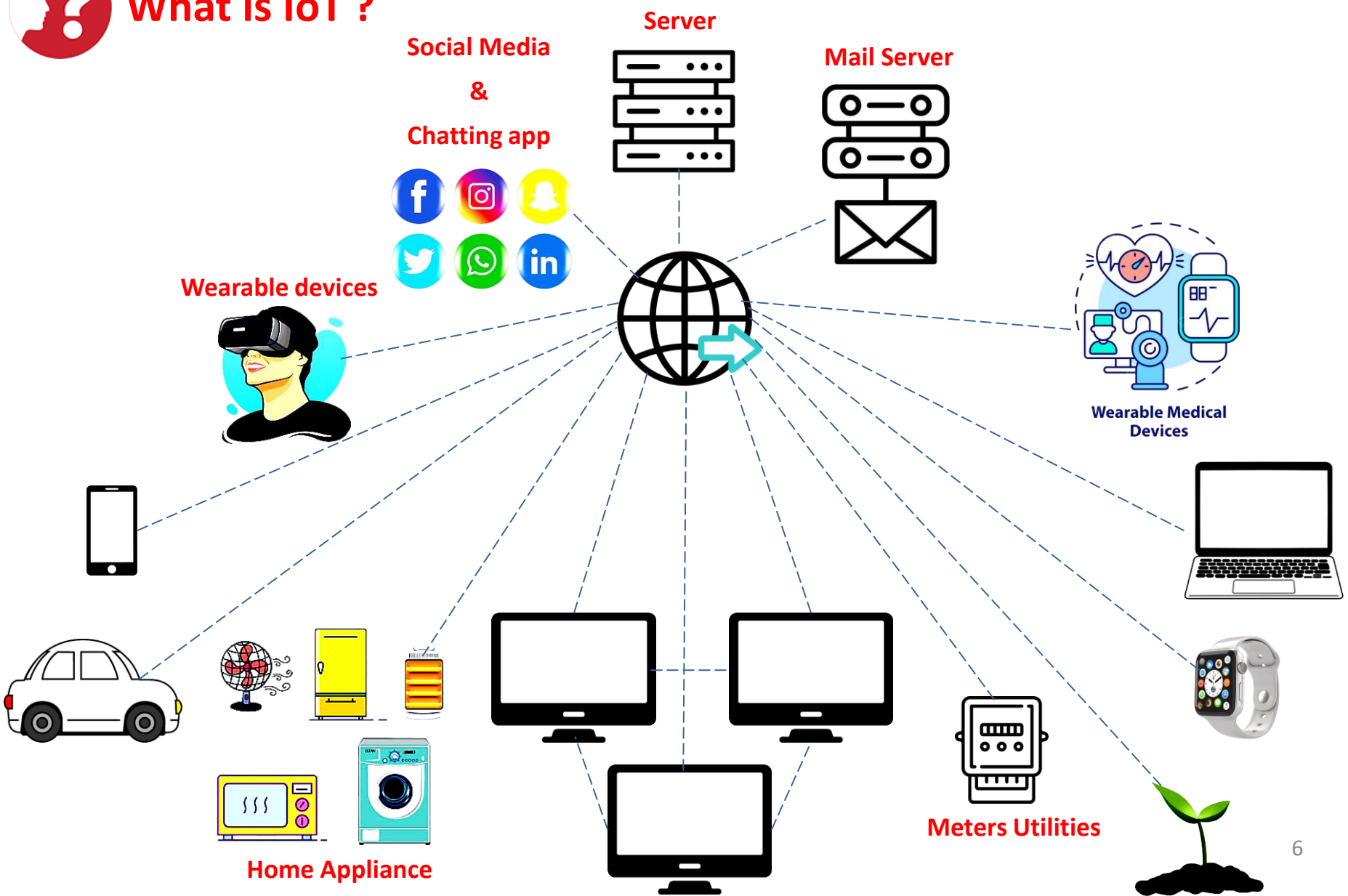
INVITATION

https://classroom.google.com/c/NzUwNzg4NDExNDE3?cjc=th56env

Introduction

Introduction

What is IoT ?



Introduction

What is IoT ?

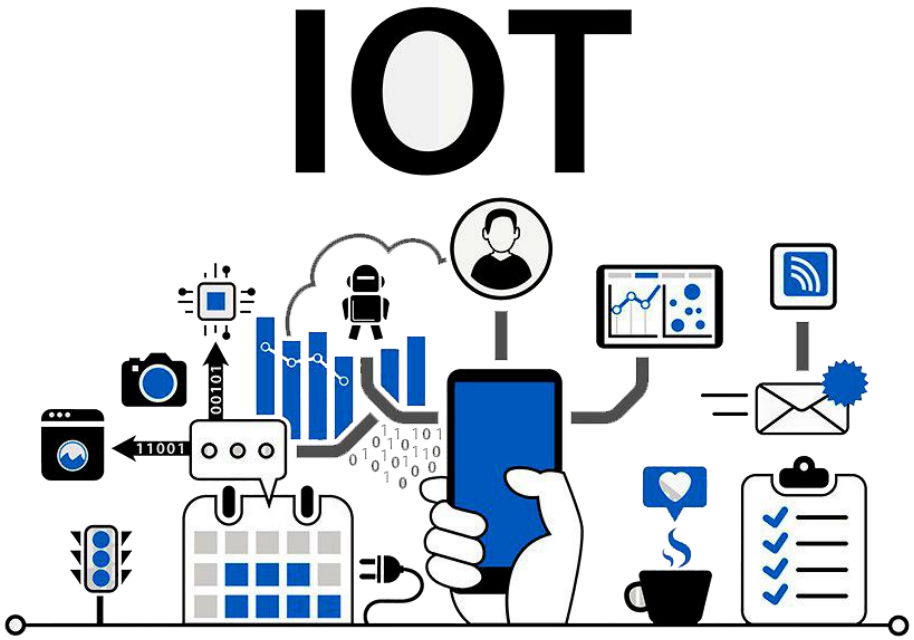
Internet
of
Thing

Many **Things** connected via the Internet

Introduction

What is IoT ?

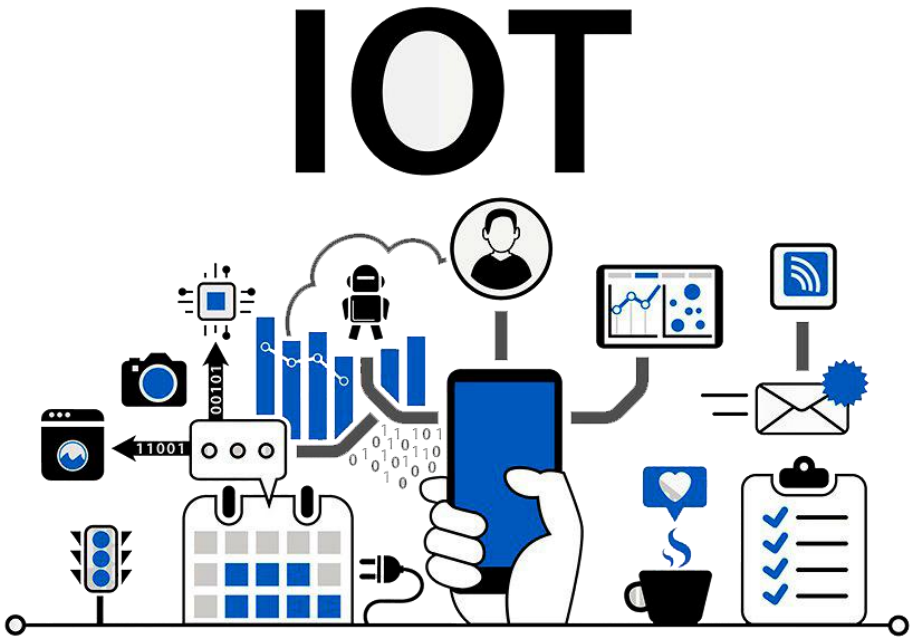
The Internet of Things (IoT) refers to a network of physical devices, vehicles, appliances, and other physical objects that are embedded with sensors, software, and network connectivity, allowing them to collect and share data.



Introduction

What is IoT ?

IoT devices—also known as “smart objects”—can range from simple “smart home” devices like smart thermostats, to wearables like smartwatches and RFID-enabled clothing, to complex industrial machinery and transportation systems. Technologists are even envisioning entire “smart cities” predicated on IoT technologies.



Introduction

- IoT enables these smart devices to communicate with each other and with other internet-enabled devices. Like smartphones and gateways, creating a vast network of interconnected devices that can exchange data and perform various tasks autonomously. This can include:

- Monitoring environmental conditions in farms

- Managing traffic patterns with smart cars and other smart automotive devices

- Controlling machines and processes in factories

- Tracking inventory and shipments in warehouses

IoT Applications

IoT Application | Main Categories

Home Consumers

Characteristics

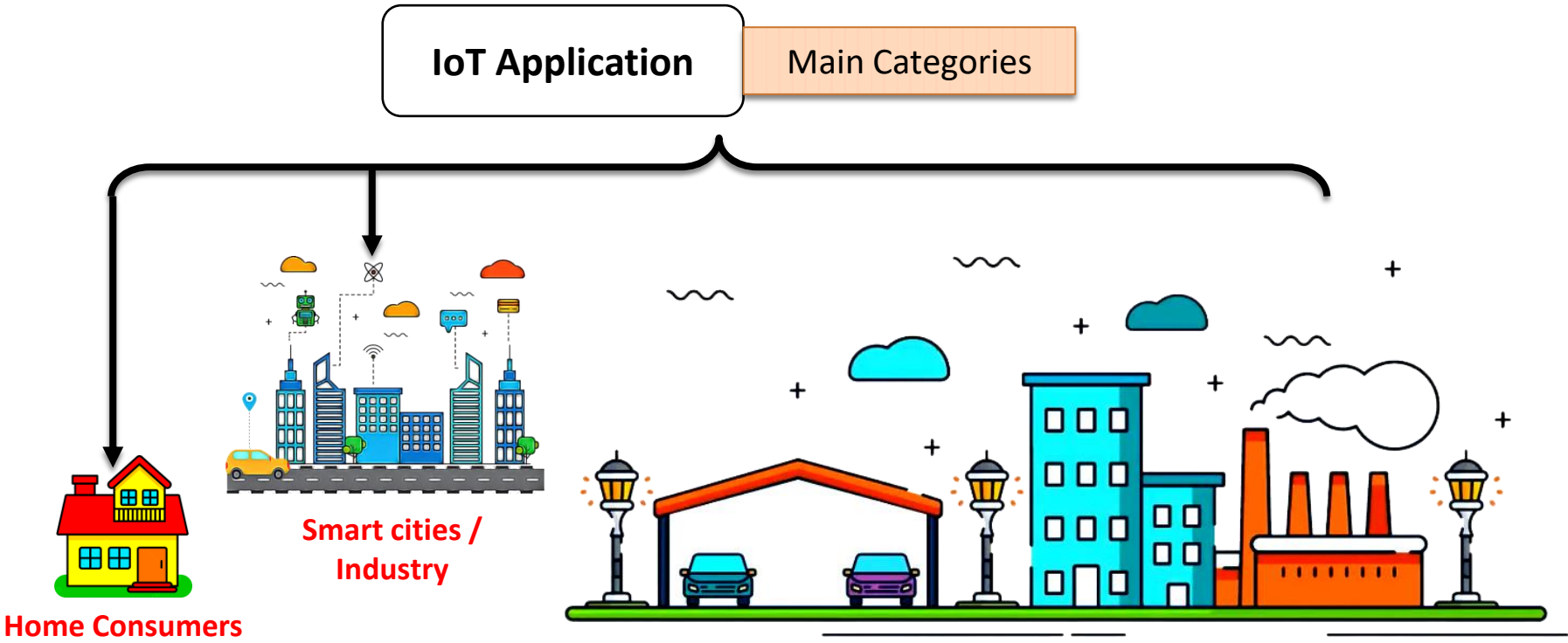
1- Serving many Devices

2- Connected to Wi-Fi

3- Free of Charge (Revenue from advertising)

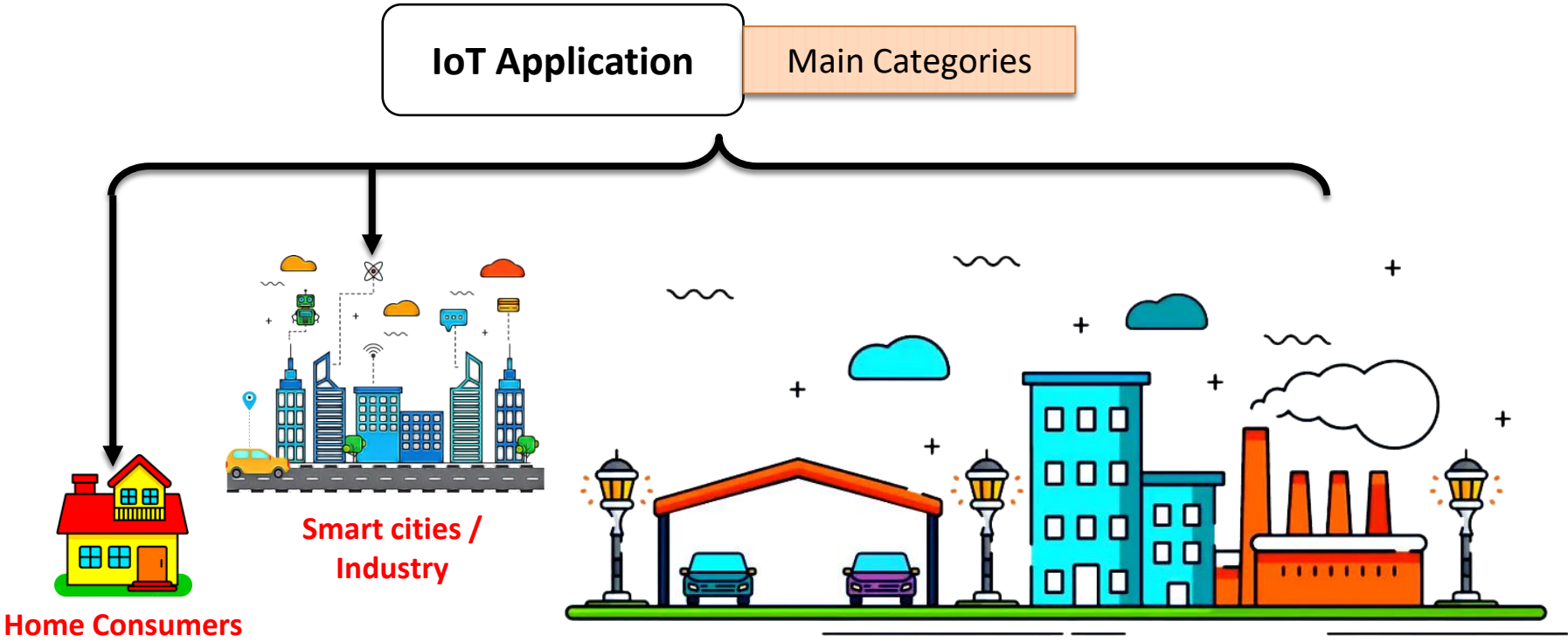
4- Low Revenues

IoT Applications



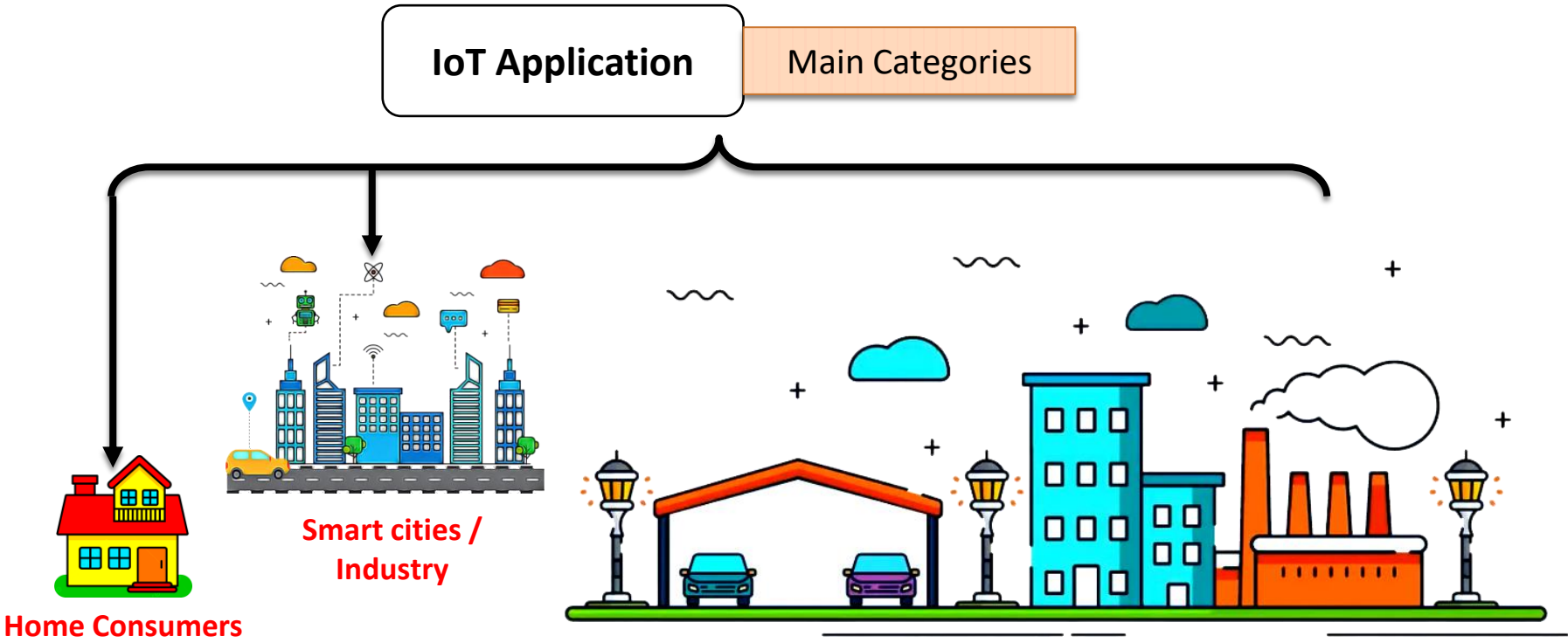
Smart Cities have streets, electricity columns for lighting. To manage lighting, number of working hours, quantity of lighting will be remotely controlled and managed. There will be smart parking, we need to know places of car stops, parking are busy or empty, all of this will be also remotely controlled.

IoT Applications



Smart Cities will also have sensors and devices that measure temperature, humidity, noise level and overcrowding in different places in a city. So smart cities also have huge number of sensors and devices

IoT Applications



This category also includes Smart Industries, so factories will be managed remotely.

1- Operation of the factory.

2- Quality Control.

3- The quantity of products.

4- Energy Consumption.

5- Resources Consumption.

Factory use these applications to produce more, to earn more.

IoT Applications

IoT Application — Main Categories

Smart cities / Industry

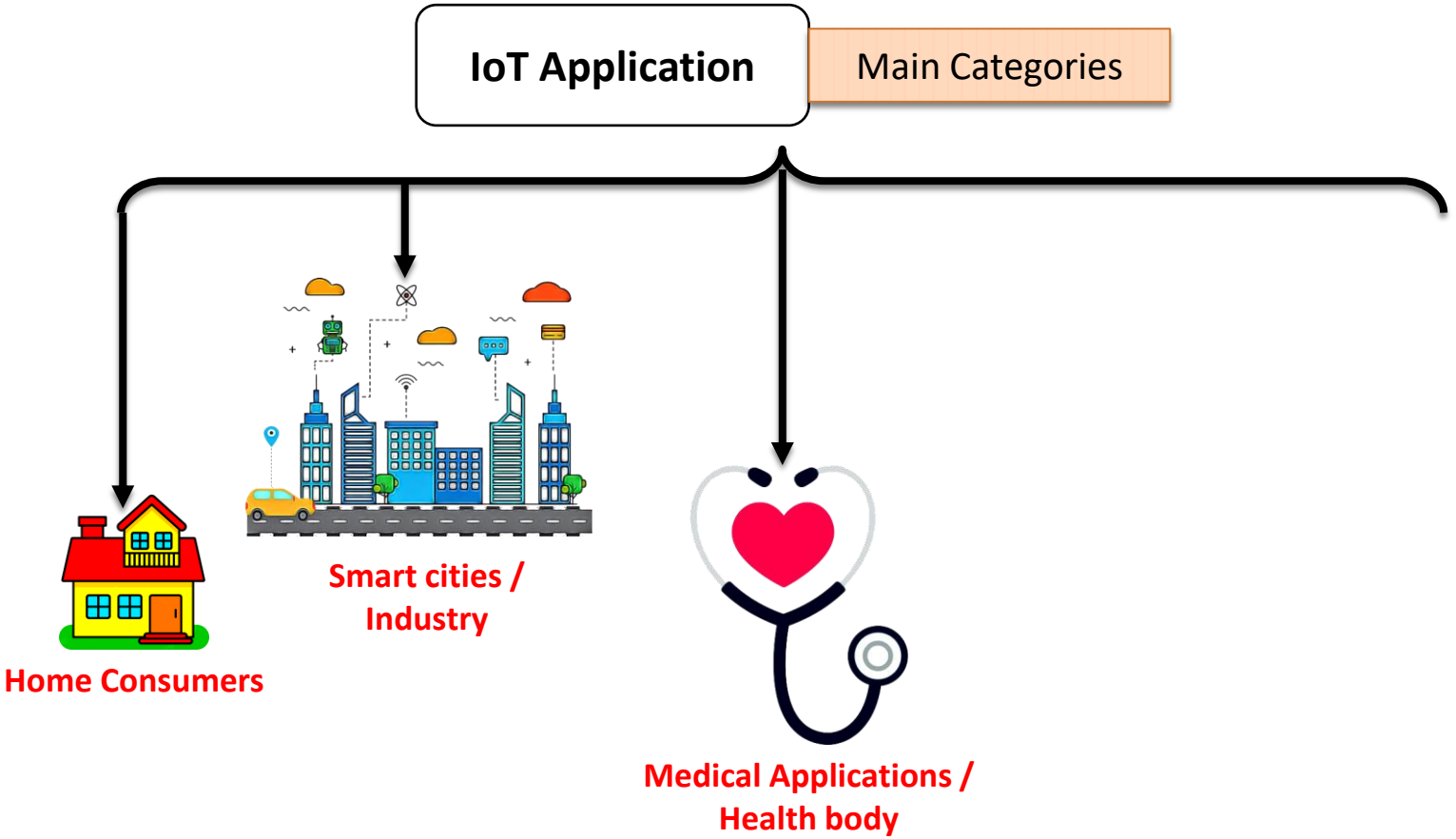
Home Consumers

Characteristics

1- High Revenues "Business to Business applications"

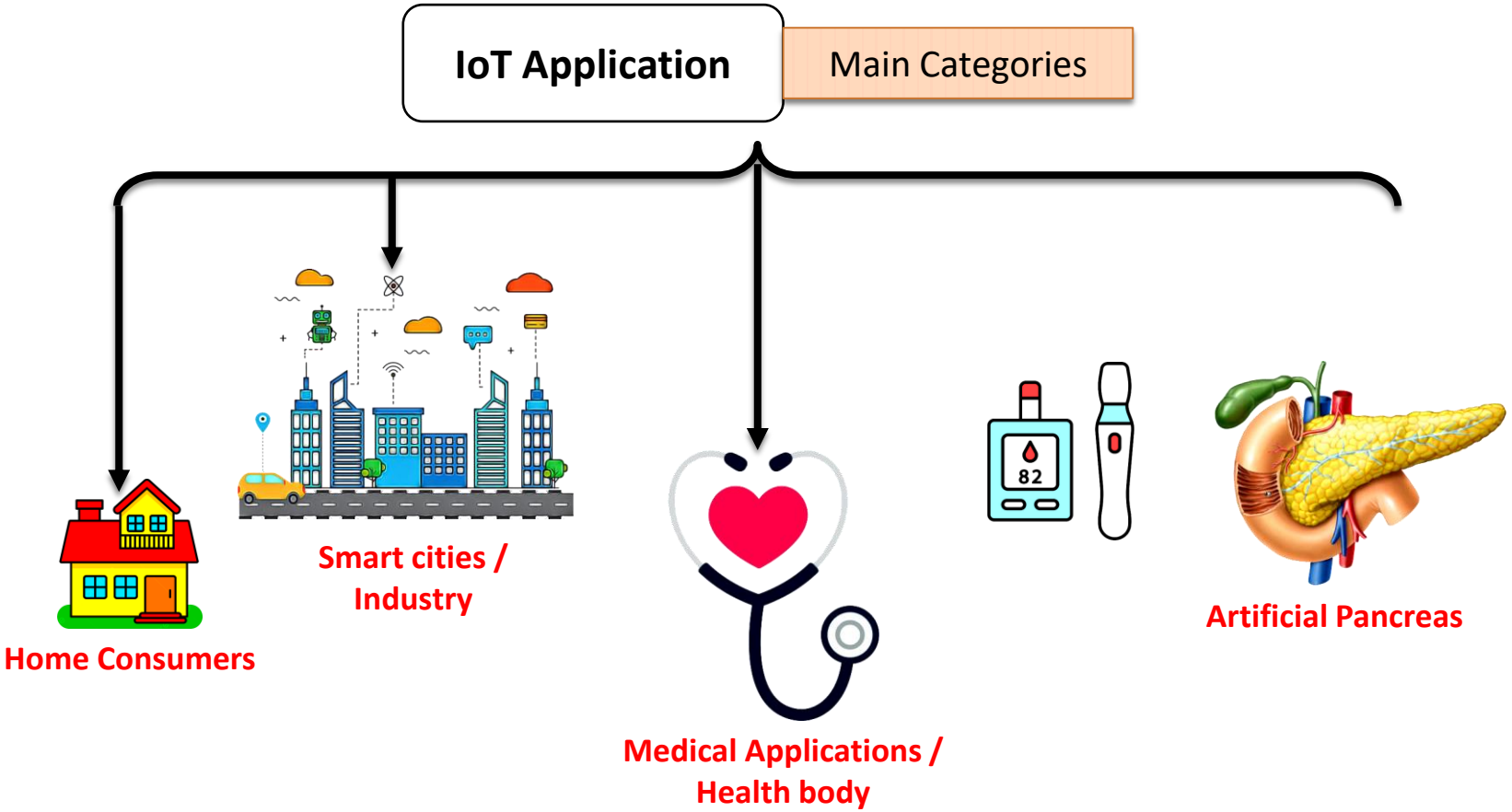
2- There is no much applications, but they control a great number of devices.

IoT Applications



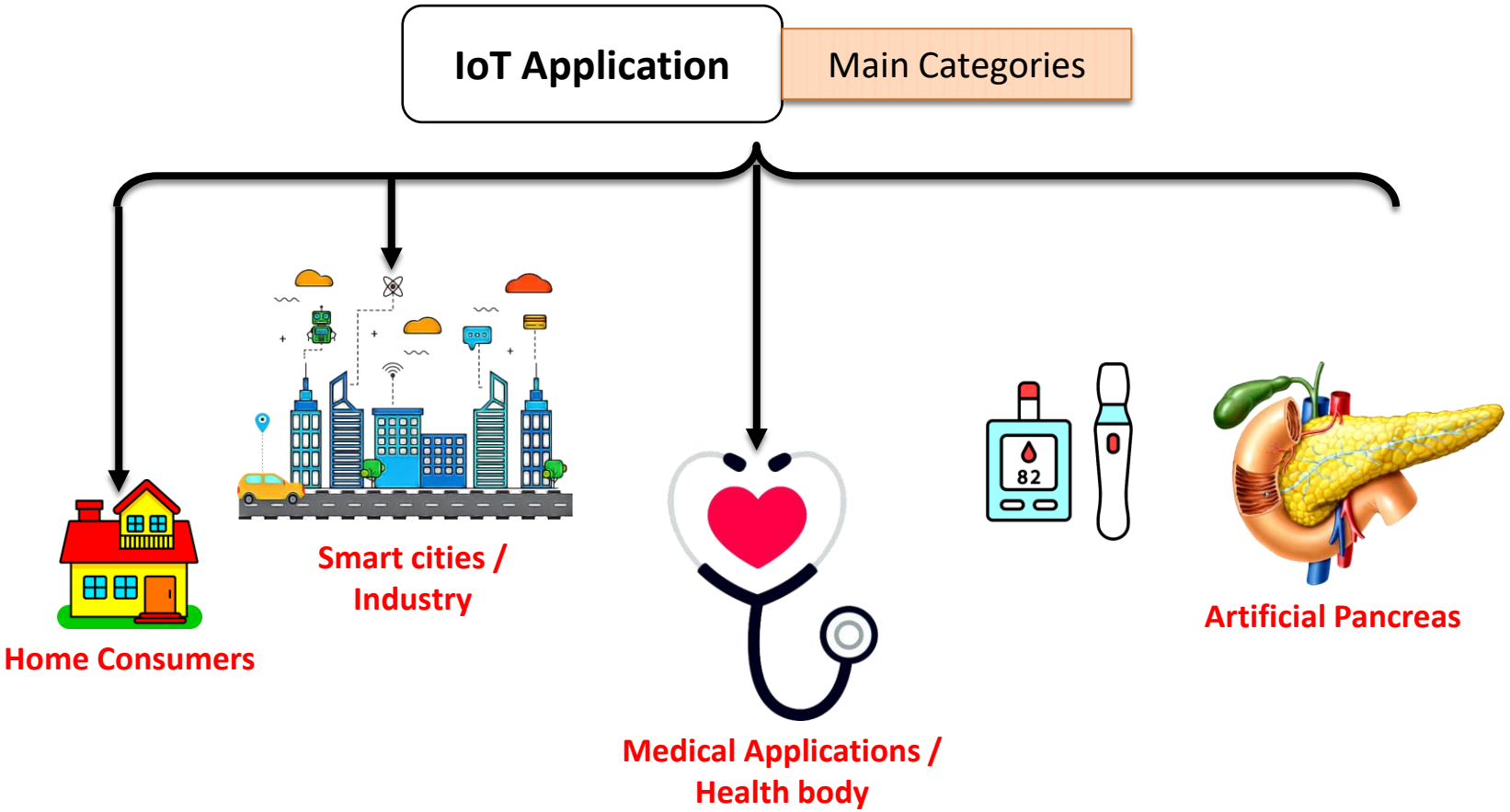
Devices that will be used for medical purposes, these devices will be available not only on hospitals but also, they may be implanted devices "Devices installed inside human body".

IoT Applications



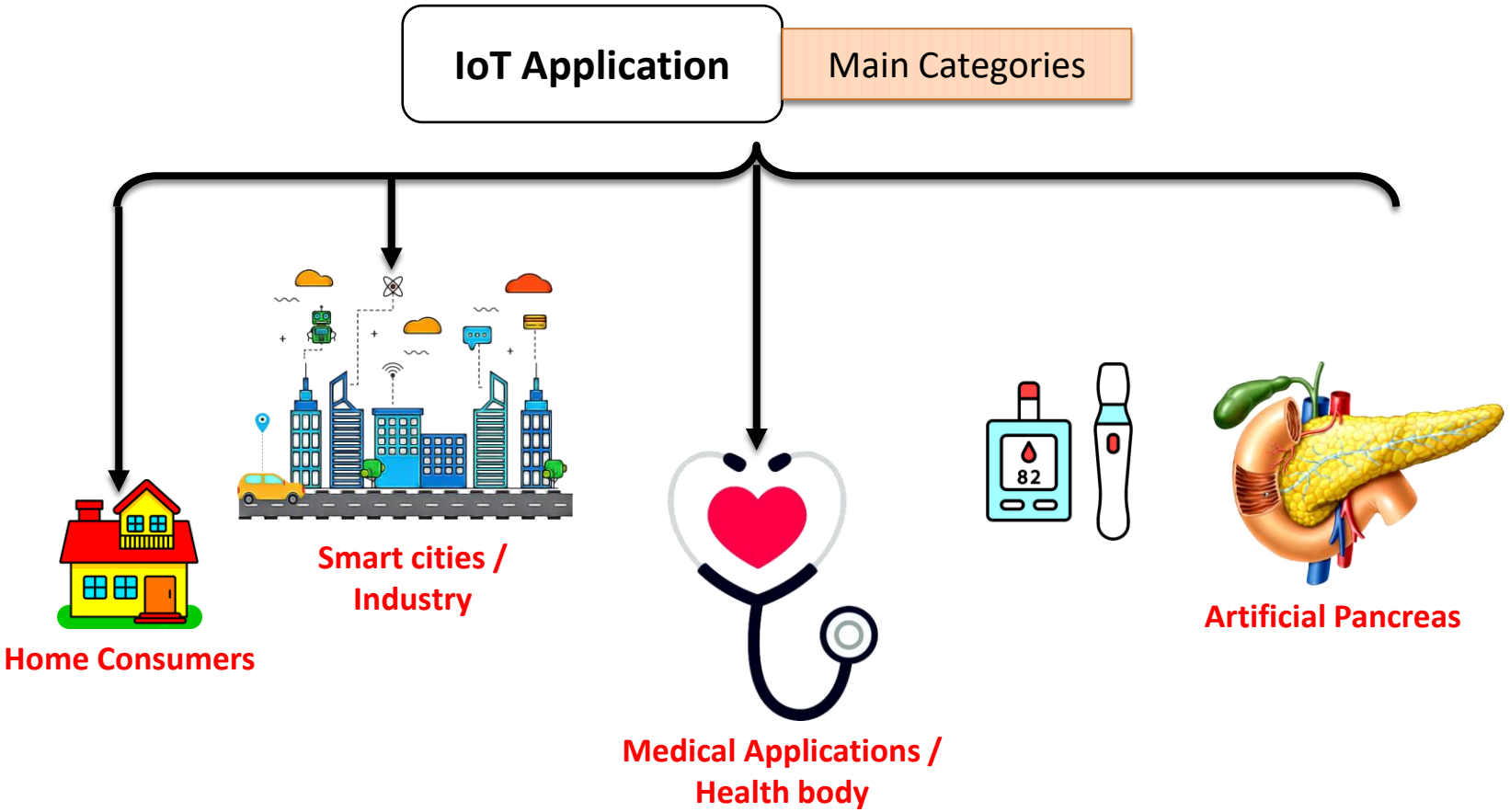
Diabetics require constant monitoring and analysis, there will be artificial pancreas that will be implanted in the human body, it analyzes the diabetes and send the results through the internet to the cloud .

IoT Applications



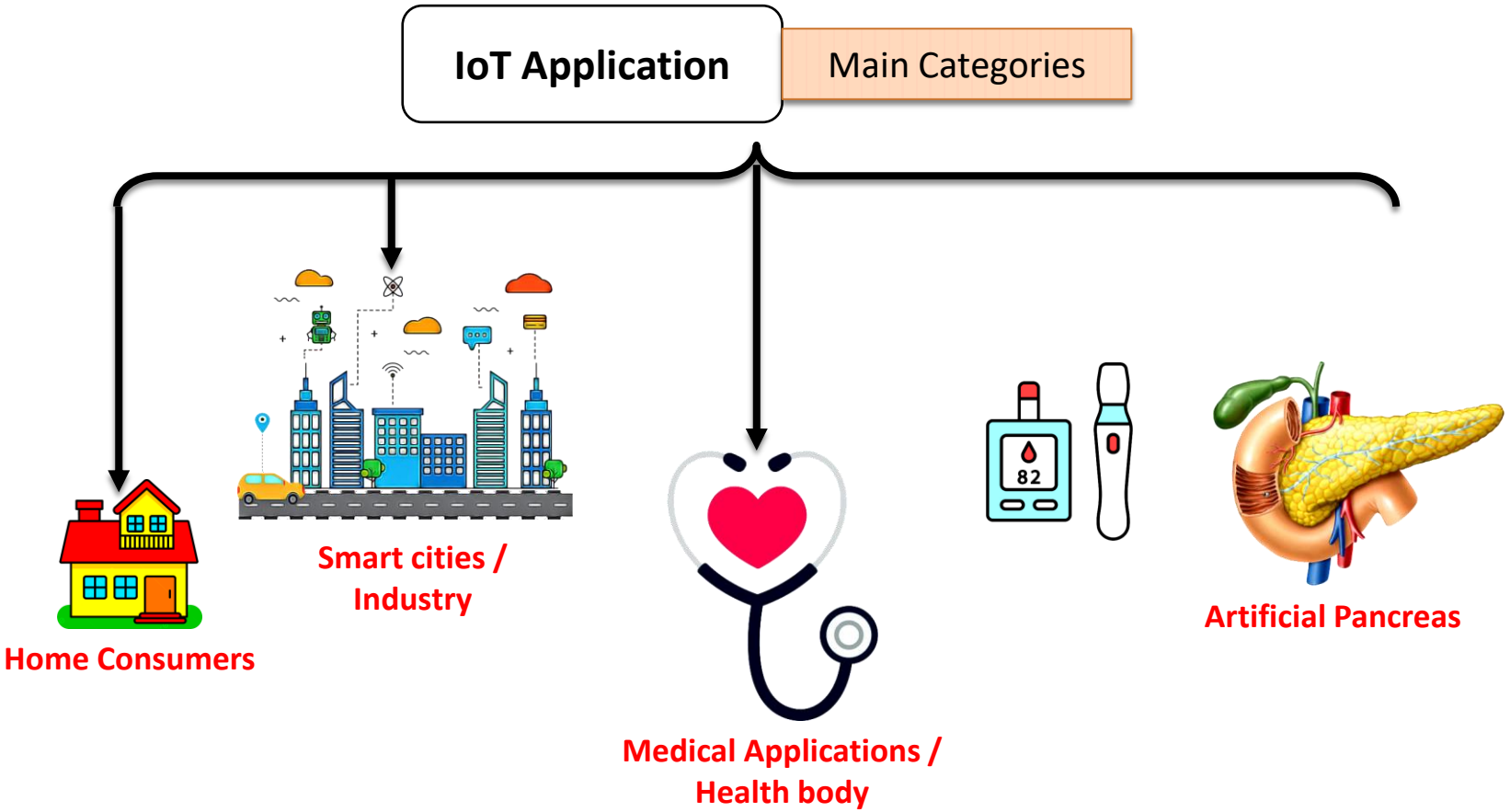
The system on the internet decides if the patient need insulin, then it will send back to the implanted artificial pancreas to use the insulin saved in the pancreas bump .

IoT Applications



This means that the devices need to send messages outside the human body, so these devices require long life battery. These devices require long approval process and research process which need a lot of time and money.

IoT Applications



These devices also require long approval process and research process which need a lot of time and money. It should be applied several time on volunteers.

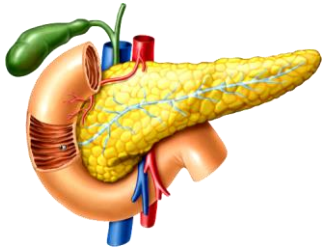
IoT Applications

IoT Application — Main Categories

Home Consumers

Smart cities / Industry

Medical Applications / Health body



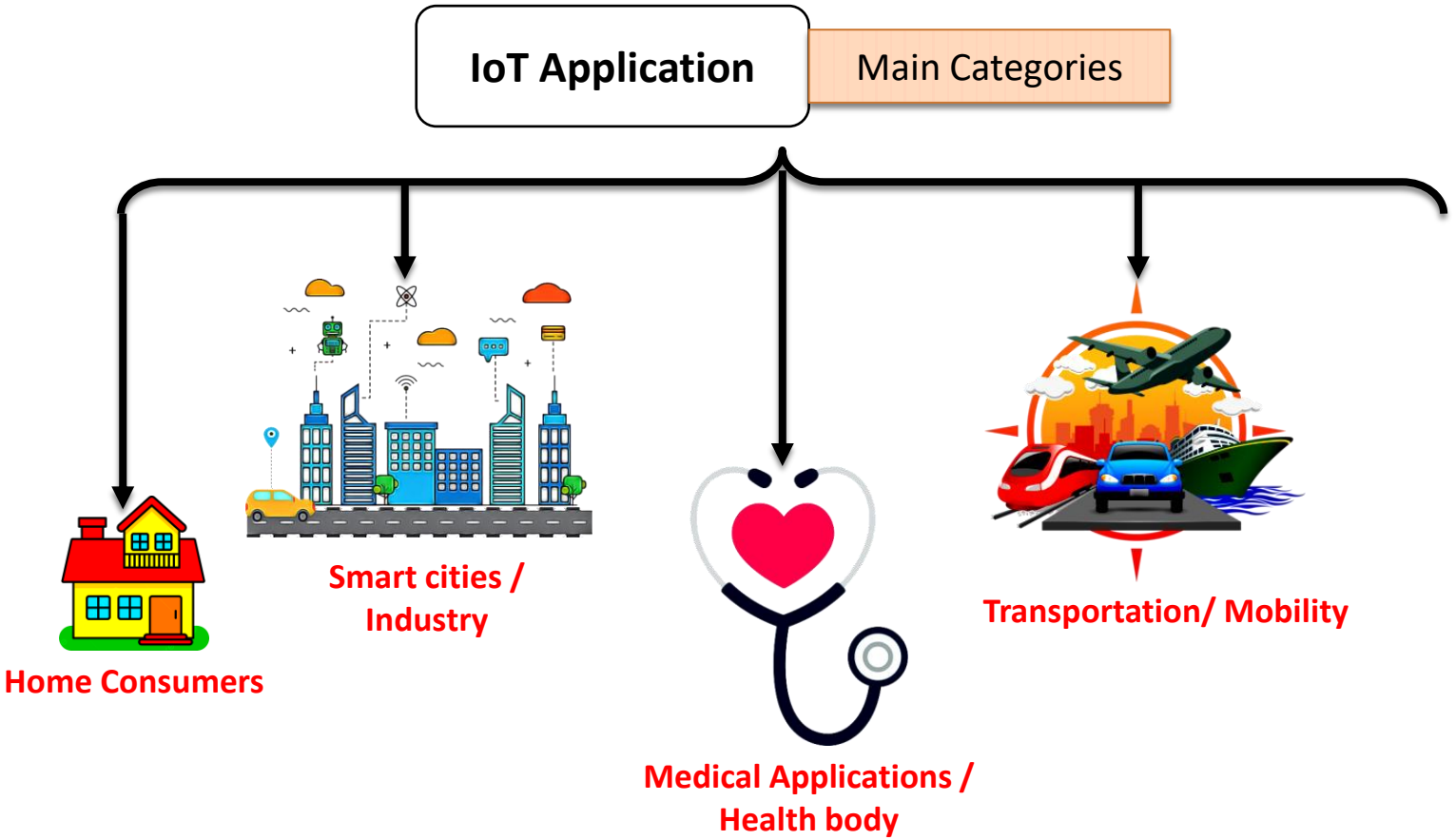
Artificial Pancreas

Characteristics

1- Devices require long life batteries "Processing Powel should be too little"

2- Serving few devices.

IoT Applications



All types of transportations have the same challenge "Mobility", so it's location always changes.

IoT Applications

IoT Application | Main Categories

Home Consumers

Smart cities / Industry

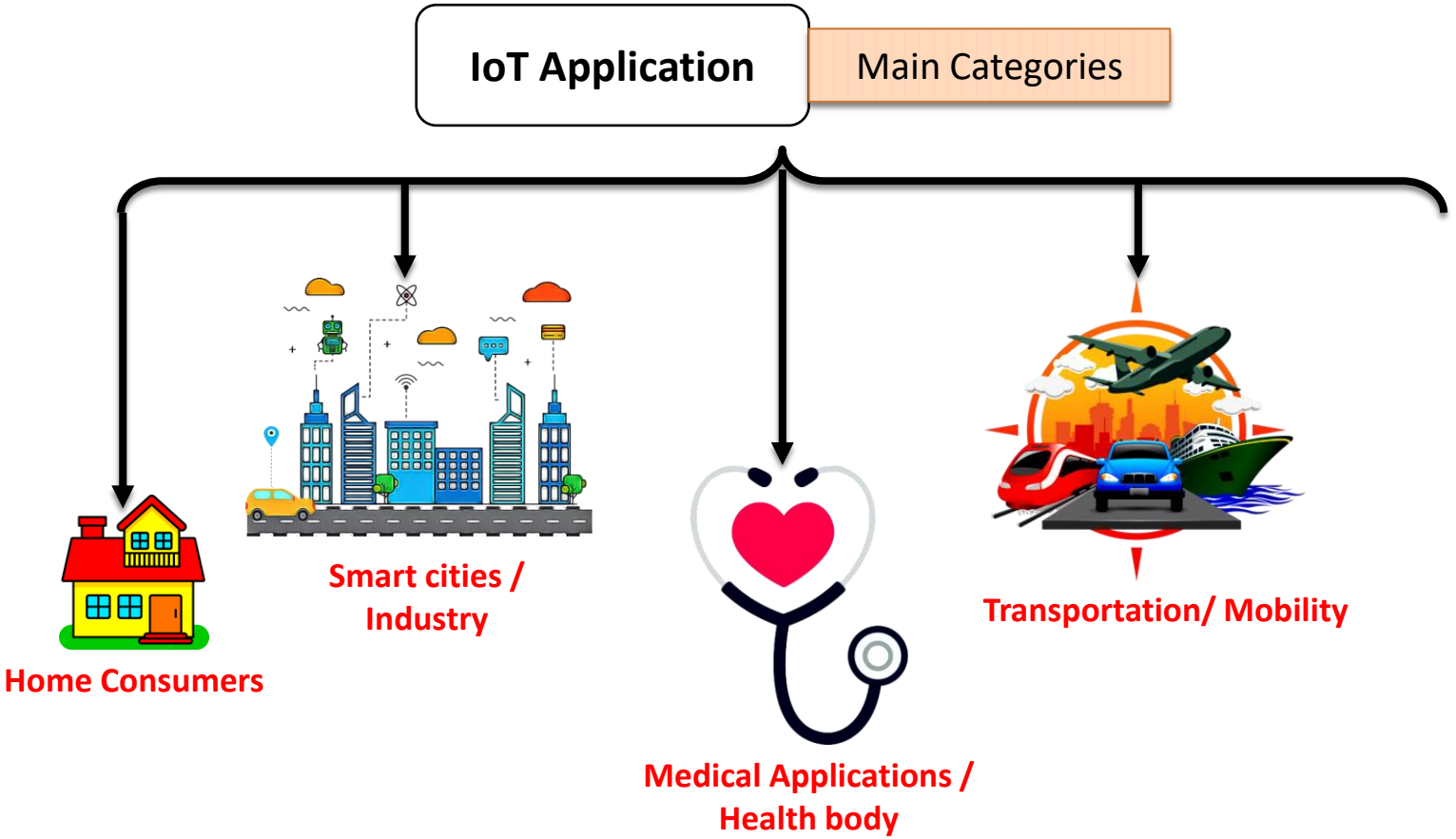
Medical Applications / Health body

Transportation/ Mobility

Characteristics

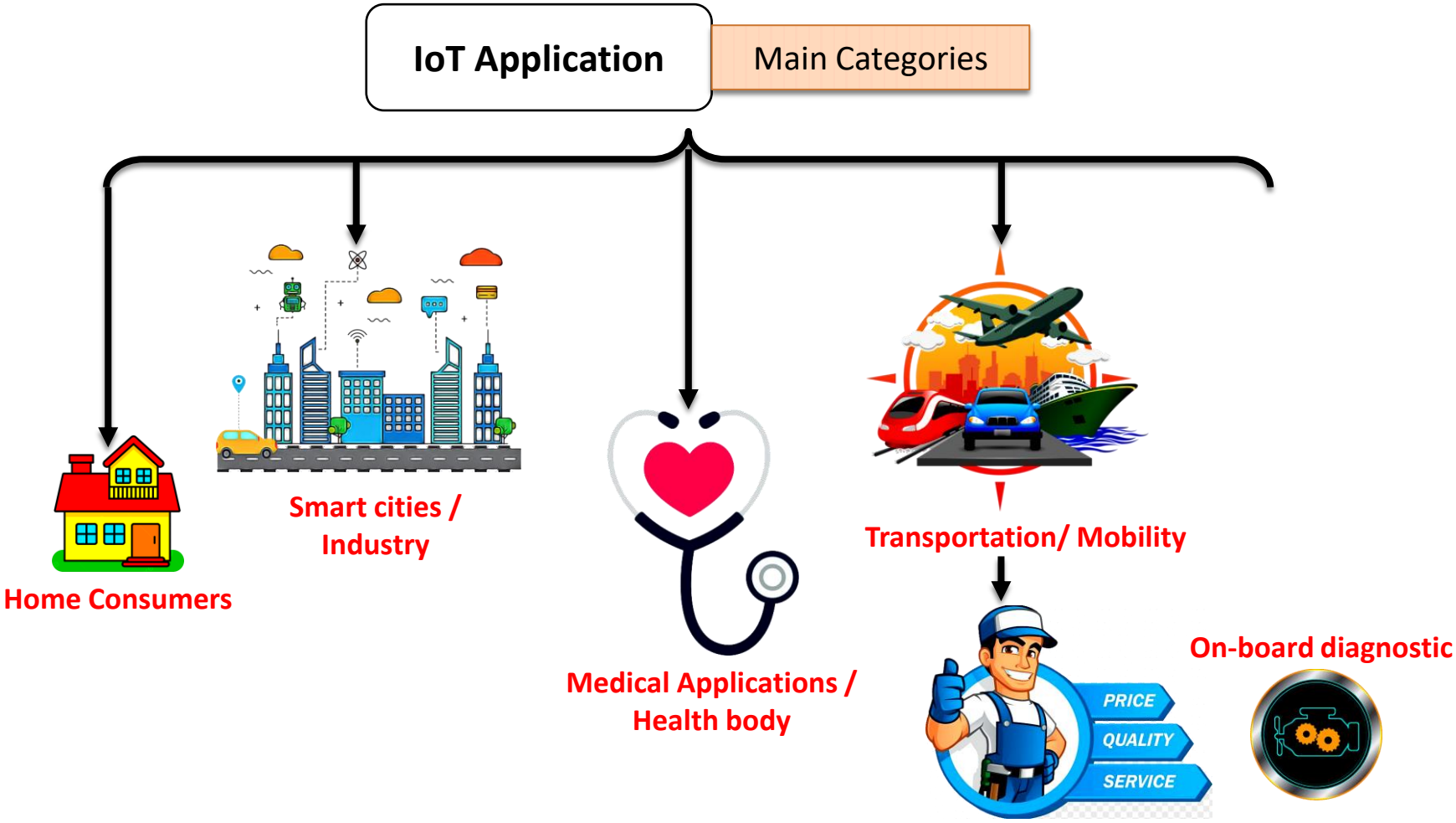
1- Location based Services

IoT Applications



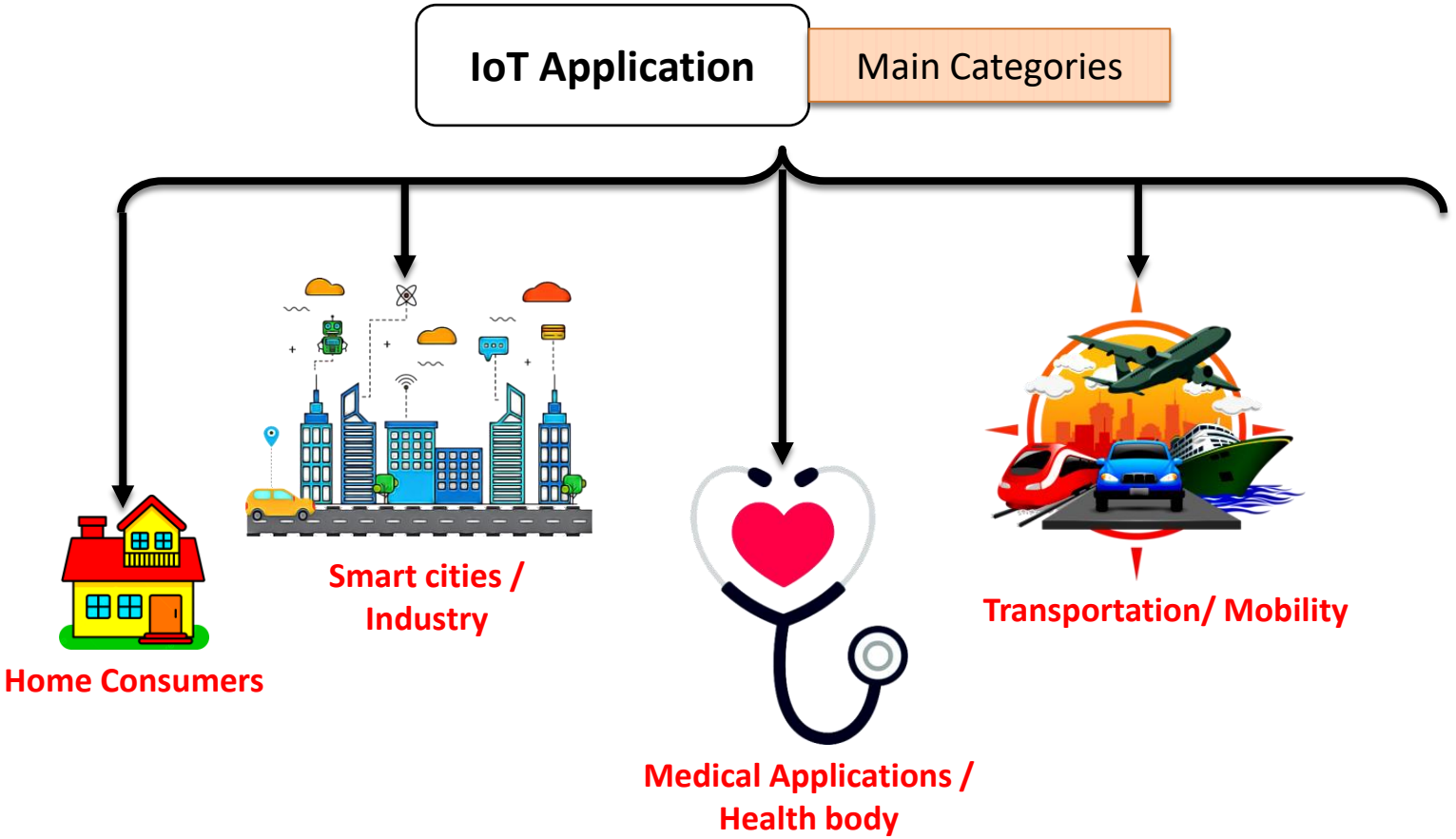
Regular maintenance is another important point for mobility category. We regularly call customer service to take an appointment for maintenance, they give us a detailed report about your car, they got all information from sensors that are already exist on the car “data is saved on small computer ”

IoT Applications



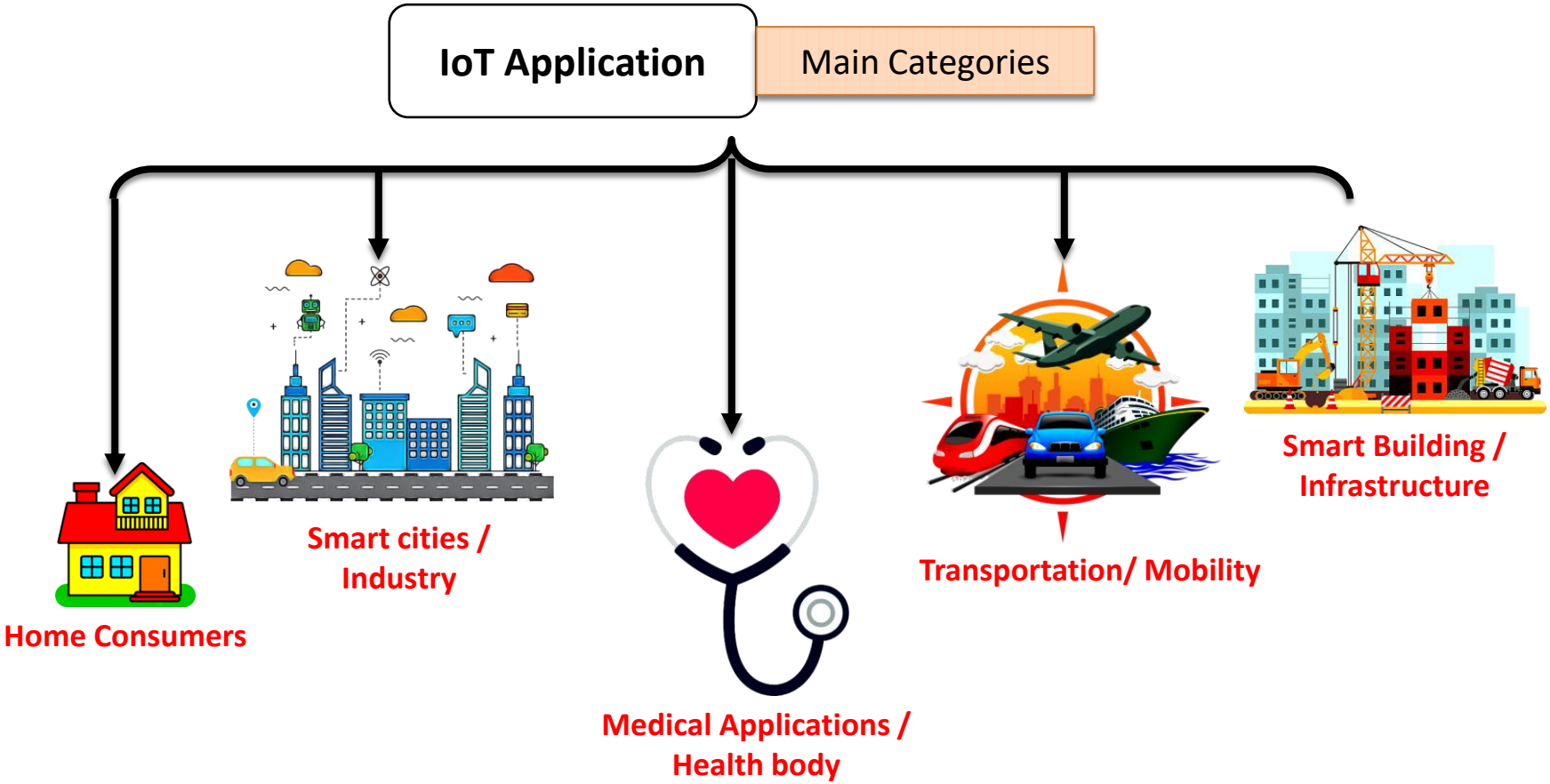
The collected data is saved on small computer called “on-board diagnostic” already exist inside the car.

IoT Applications



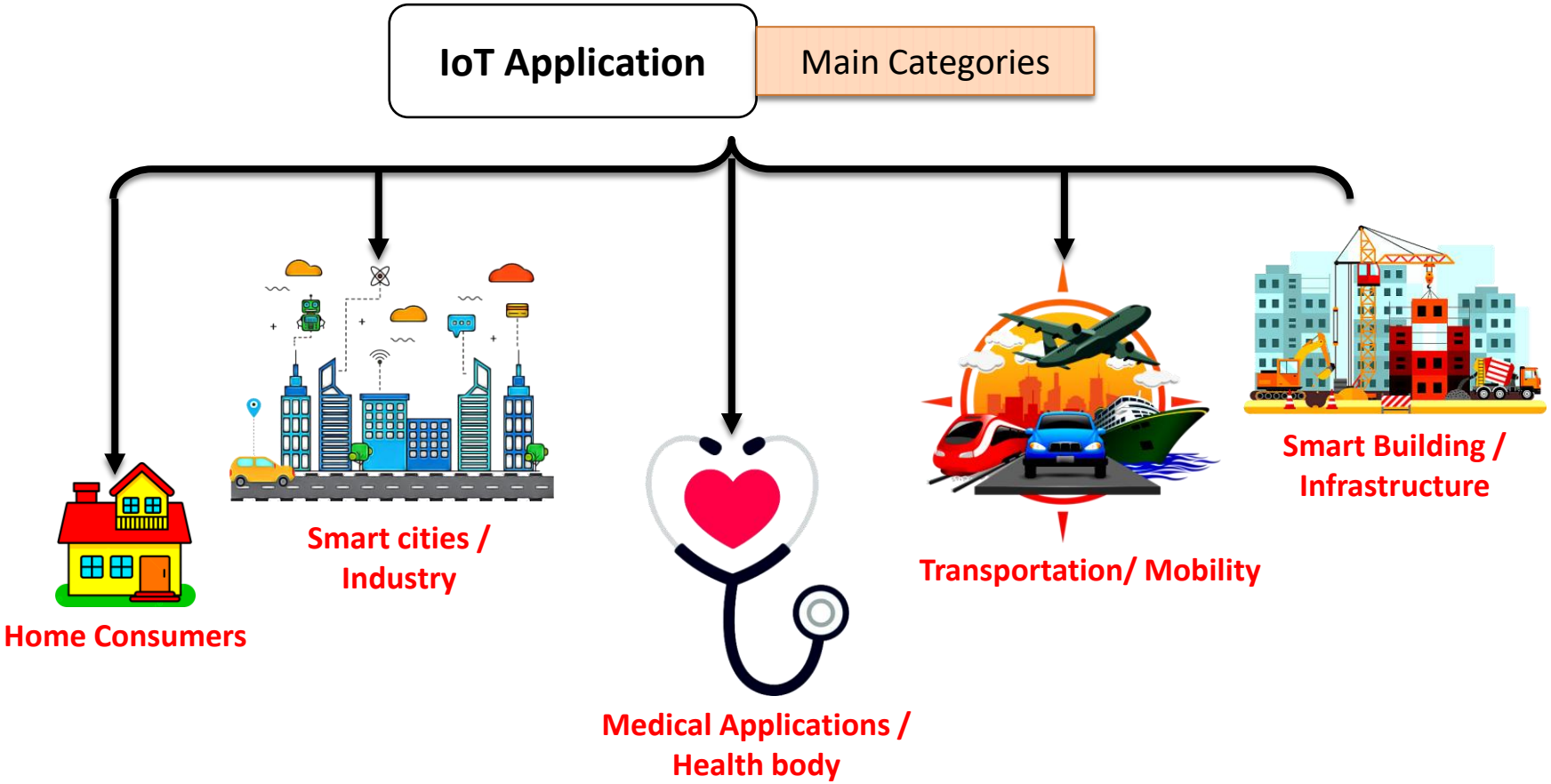
Using IoT, car is connected to the Internet, so the data already will periodically transfer to the maintenance center over Wi-Fi, Bluetooth, 3G or 4G SIM card.

IoT Applications



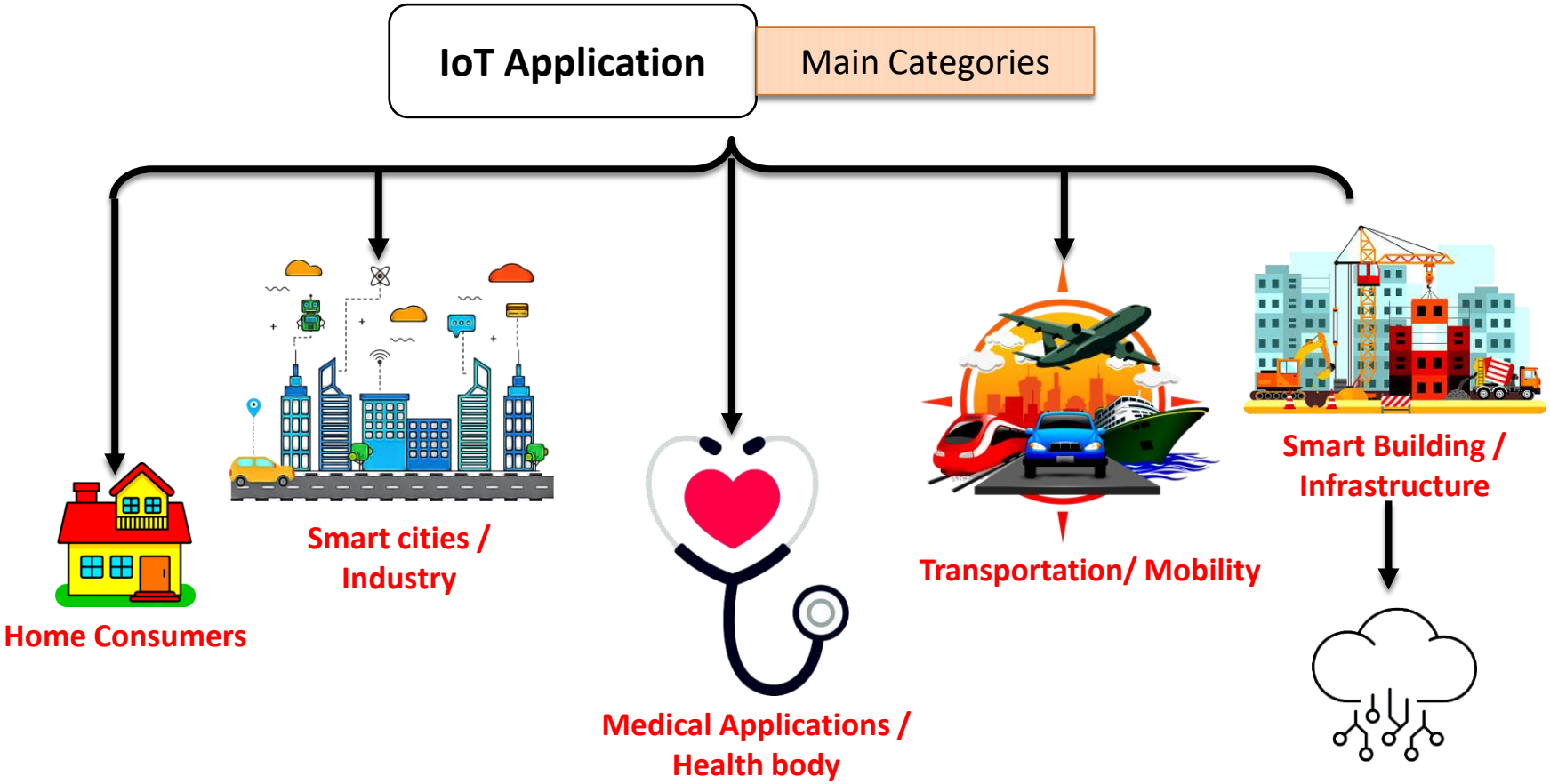
Administrative buildings have access control for the building “There are gates that allow us to enter the building” .

IoT Applications



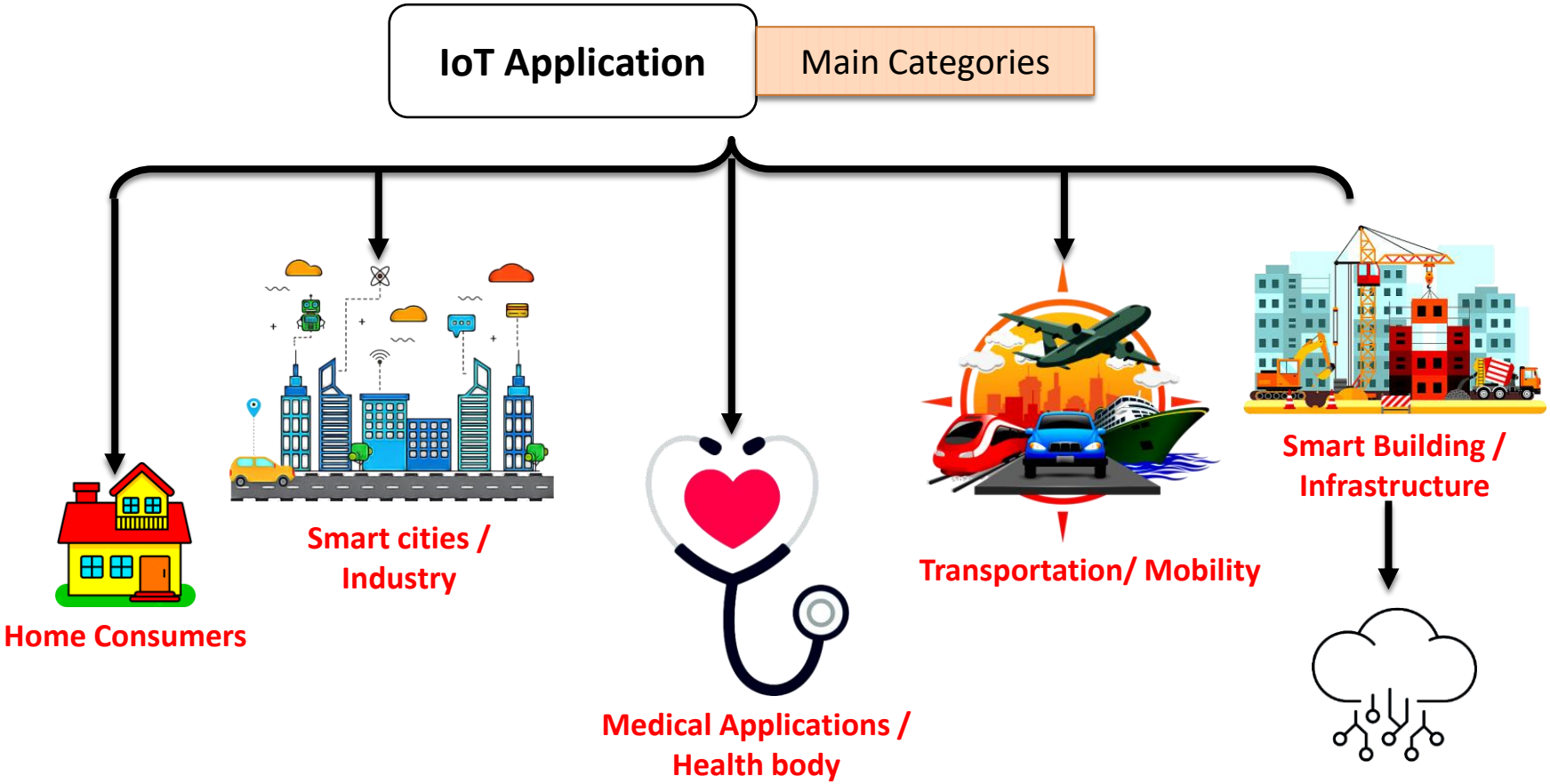
Building also have energy, lights, cooling , air conditions. We need to control these things and measure the energy all these things use, measure the temperature, and the quality of air inside the buildings is suitable to the number of people exciting in the building.

IoT Applications



The traditional Building management system can control all the previous services. IoT covert the Building management system to Cloud Based System which can serve many building at the same time

IoT Applications



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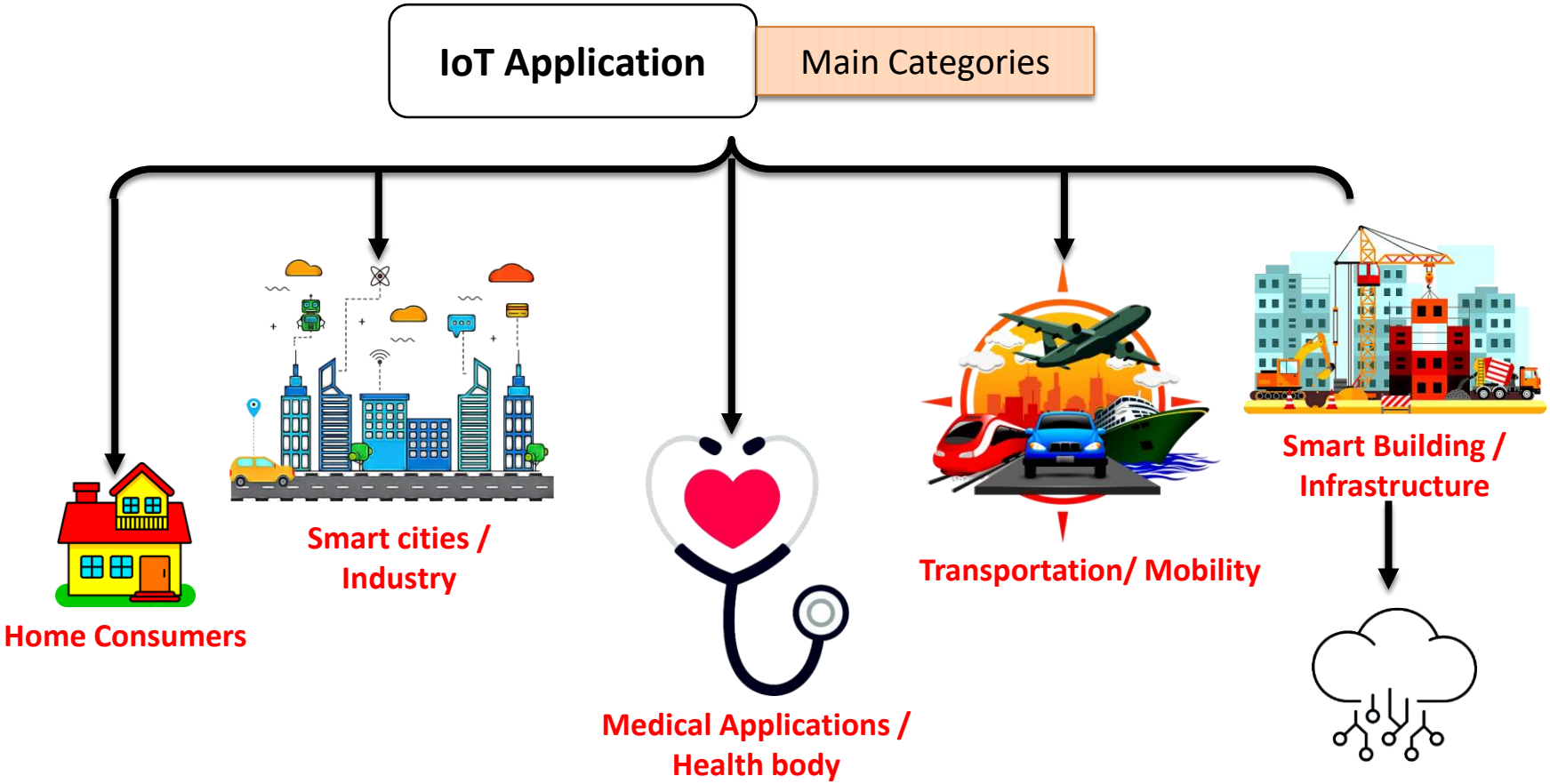
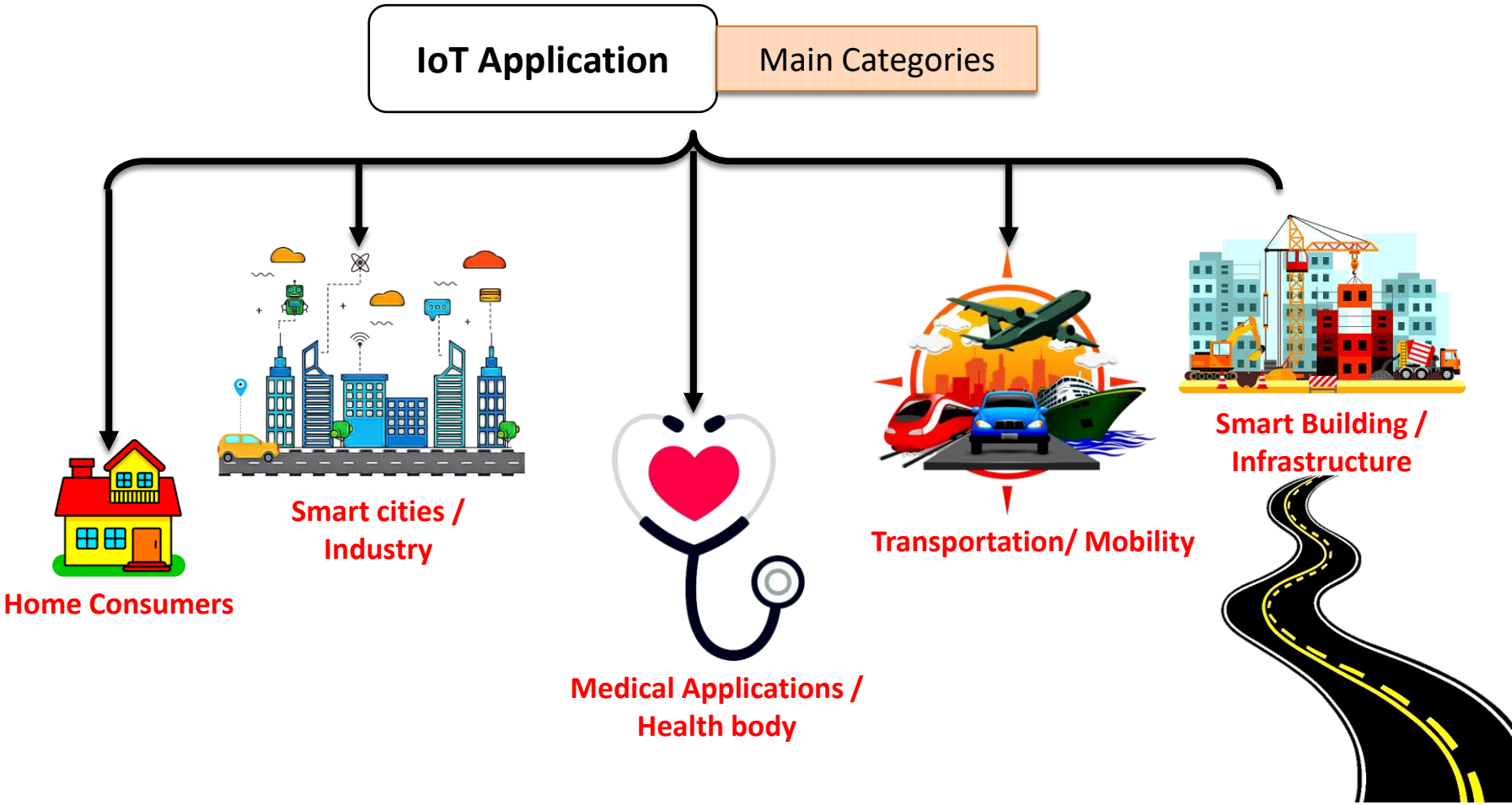


IoT covers another infrastructure services such as observing stability, leaning, load and tension. This mean that, there will be devices implanted in the concrete of ceiling and these devices are implanted during building, so it need permanent source of power.

IoT Applications



Regular maintenances, streets may need if the street over used. IoT solve this problem by monitoring the implanted devices under asphalt which measure the temperature, humidity and the load of it.


THANK


QUESTIONS