



# **Sunbeam Institute of Information Technology**

## **Pune and Karad**

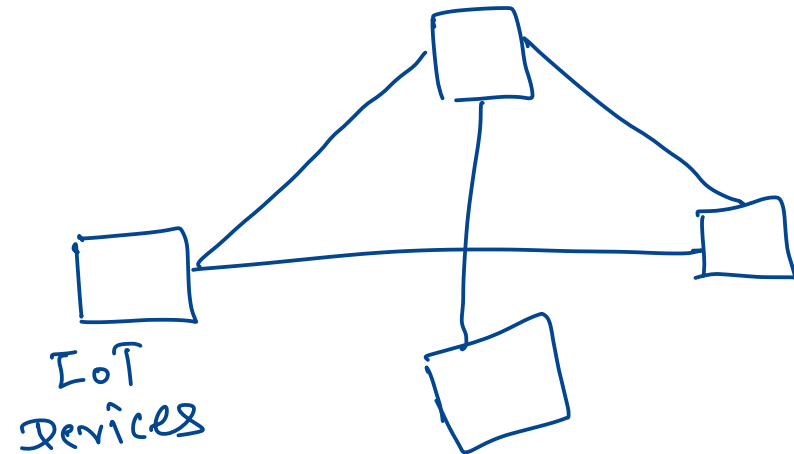
### **Module – Internet of Things (IoT)**

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# Internet of Things (IoT)

- **Internet of things (IoT)** describes devices with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the Internet or other communication networks.
- **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.



Several technologies come together to make IoT possible.

- **Sensors and actuators**

- Sensors are devices that can detect changes in the environment, such as temperature, humidity, light, motion, or pressure.
- Actuators are devices that can cause physical changes in the environment, such as opening or closing a valve or turning on a motor.
- Automation is possible when sensors and actuators work to resolve issues without human intervention.

- **Connectivity technologies**

- To transmit IoT data from sensors and actuators to the cloud, IoT devices need to be connected to the internet.
- There are several connectivity technologies that are used in IoT, including wifi, Bluetooth, cellular, Zigbee, and LoRaWAN.

- **Cloud computing**

- platforms provide the infrastructure and tools that are needed to store and analyze this data, as well as to build and deploy IoT applications.

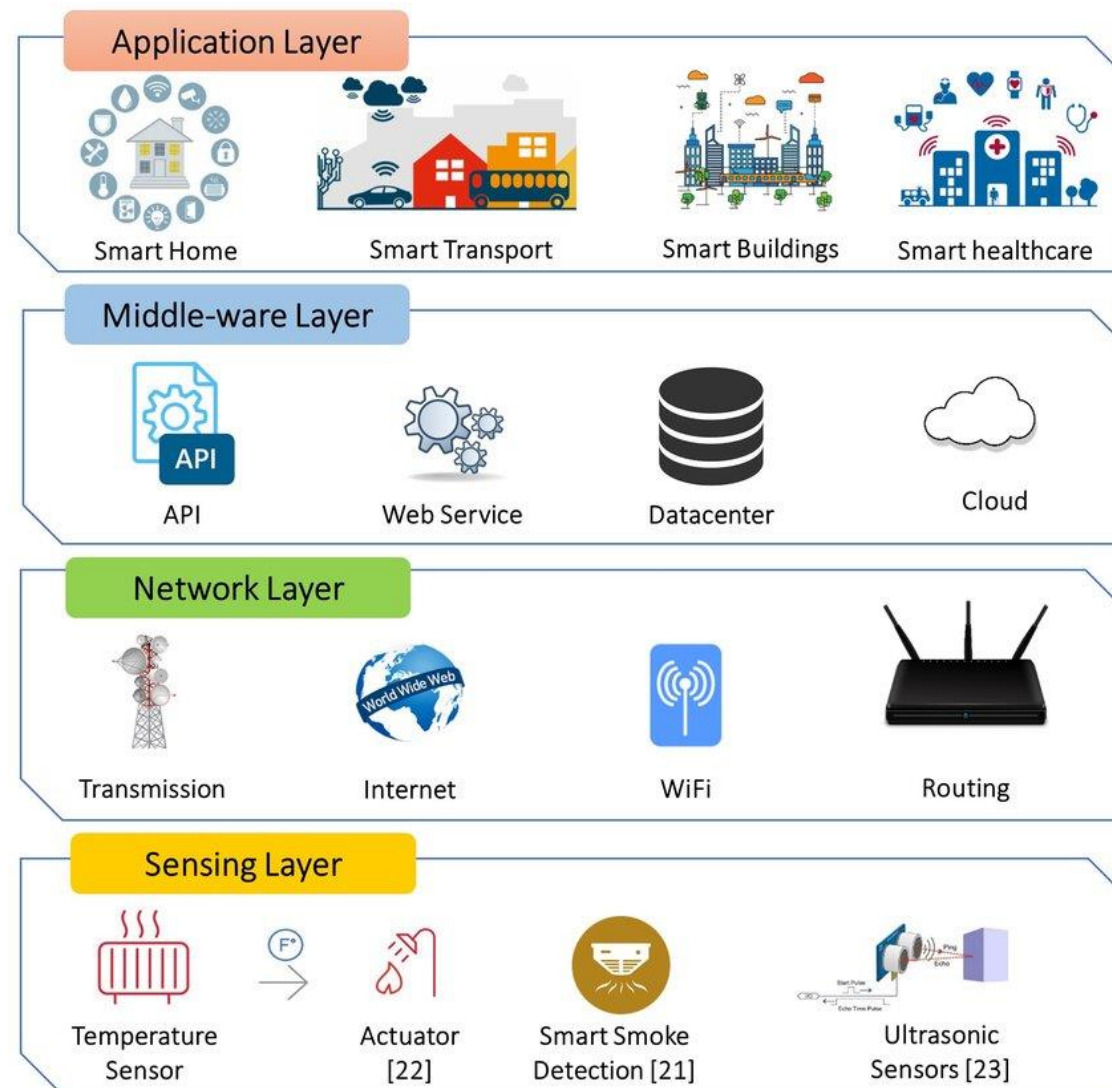
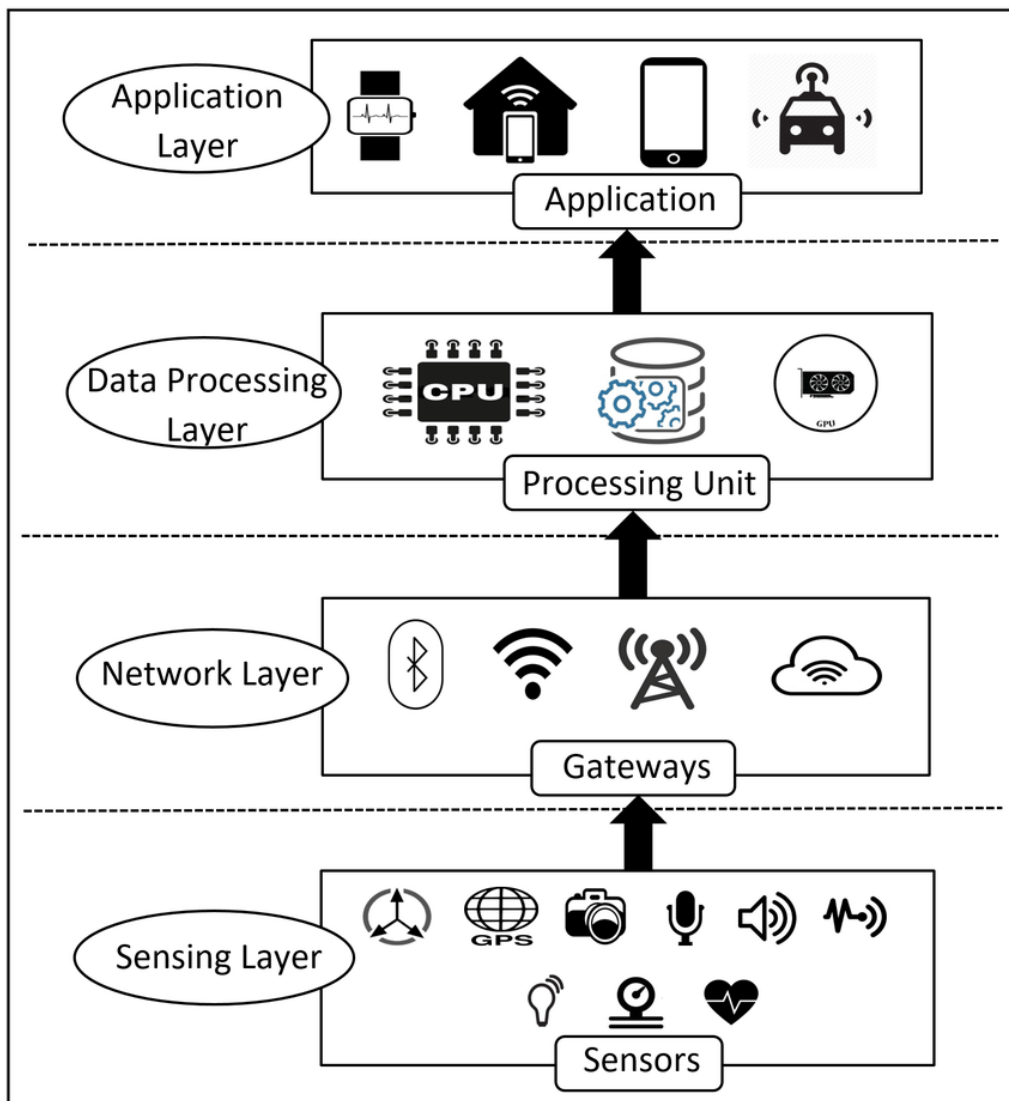
Several technologies come together to make IoT possible.

- **Big data analytics**
  - data generated by IoT devices need to use advanced analytics tools to extract insights and identify patterns.
  - These tools can include machine learning algorithms, data visualization tools and predictive analytics models.
- **Security and privacy technologies**
  - Technologies such as encryption, access controls and intrusion detection systems are used to protect IoT devices

# Internet of Things (IoT) Architecture

- **Perception/Sensing Layer**
  - Perception refers to the physical layer, which includes sensors and actuators that are capable of collecting, accepting, and processing data over the network.
  - Sensors and actuators can be connected either wirelessly or via wired connections.
- **Network Layer**
  - This layer contains Data Acquiring Systems (DAS) and Internet/Network gateways.
  - It is necessary to transmit and process the data collected by the sensor devices.
  - This layer allows these devices to connect and communicate with other servers, smart devices, and network devices.
- **Processing Layer**
  - The processing layer is the brain of the IoT ecosystem.
  - Data is analyzed, pre-processed, and stored here before being sent to the data center
  - Data is accessed by software applications that both monitor and manage the data as well as prepare further actions.
- **Application Layer**
  - User interaction takes place at the application layer, which delivers application-specific services to the user.

# Internet of Things (IoT) Architecture





Thank you!!!

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