# SNS COLLEGE OF TECHNOLOGY

**Coimbatore-35.**
**An Autonomous Institution**

## COURSE NAME : Internet of Things

## III YEAR/ V SEMESTER

## UNIT – I INTRODUCTION

**Topic:** ***Basic Nodal Capabilities***

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HoD
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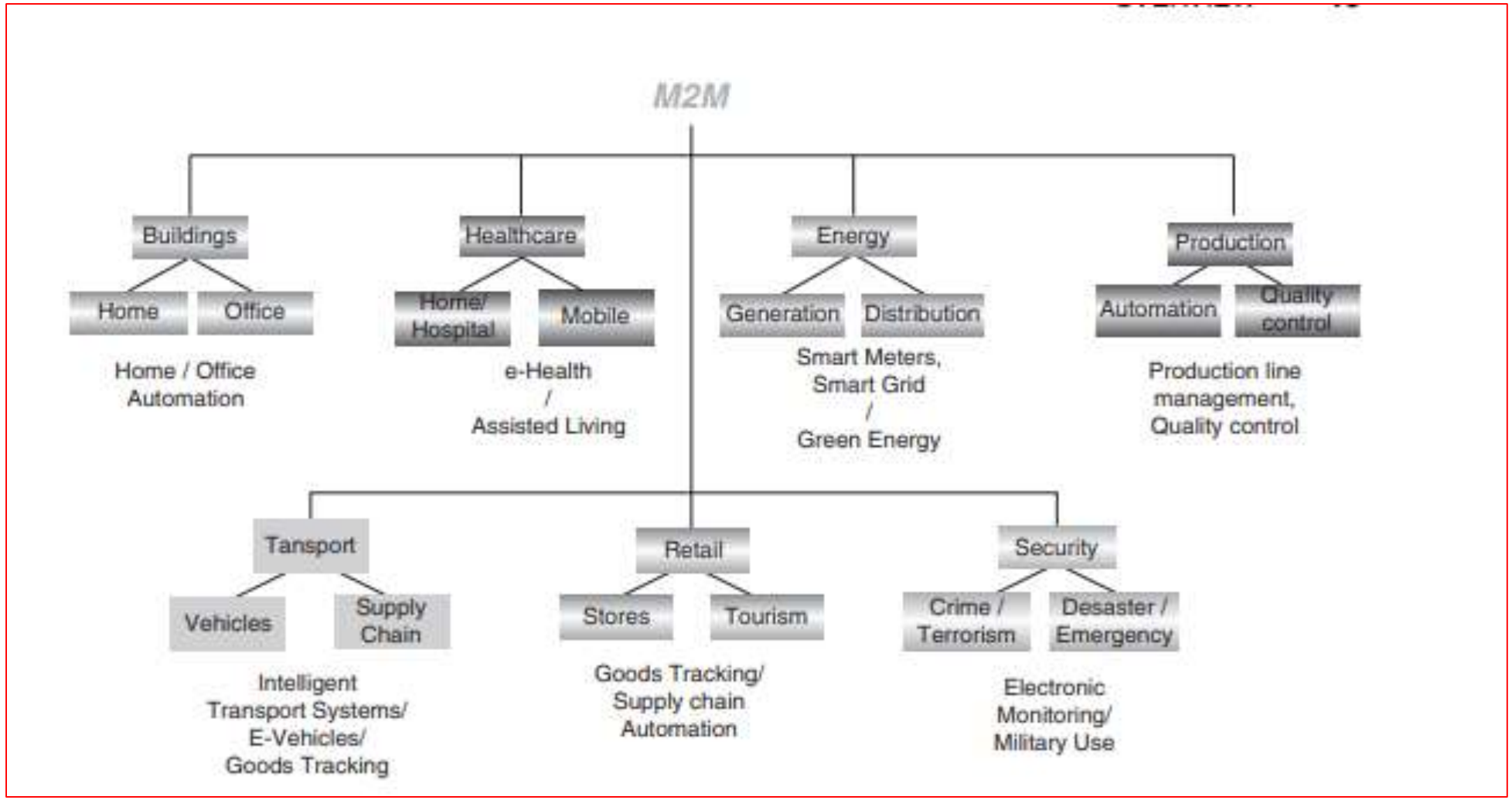

M2M
Buildings
Home
Office
Home / Office Automation
Healthcare
Home/ Hospital
Mobile
e-Health / Assisted Living
Energy
Generation
Distribution
Smart Meters, Smart Grid / Green Energy
Production
Automation
Quality control
Production line management, Quality control
Tansport
Vehicles
Supply Chain
Intelligent Transport Systems/ E-Vehicles/ Goods Tracking
Retail
Stores
Tourism
Goods Tracking/ Supply chain Automation
Security
Crime / Terrorism
Desaster / Emergency
Electronic Monitoring/ Military Use

## Smart farming: Use of IoT to improve agriculture

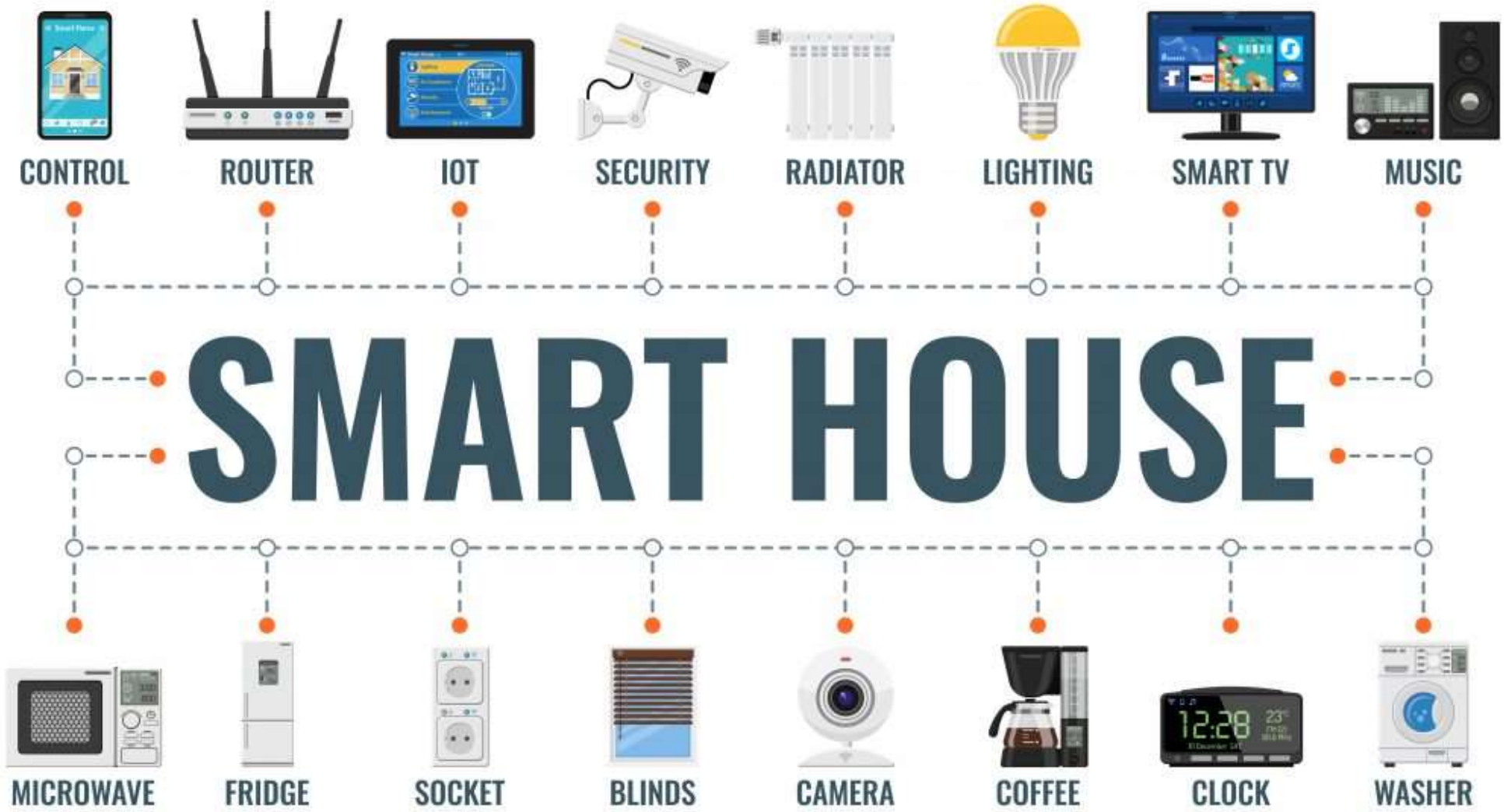
In IoT-based smart farming, a system is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, etc.) and automating the irrigation system. The farmers can monitor the field conditions from anywhere. This is highly efficient compared to the traditional/conventional approach.

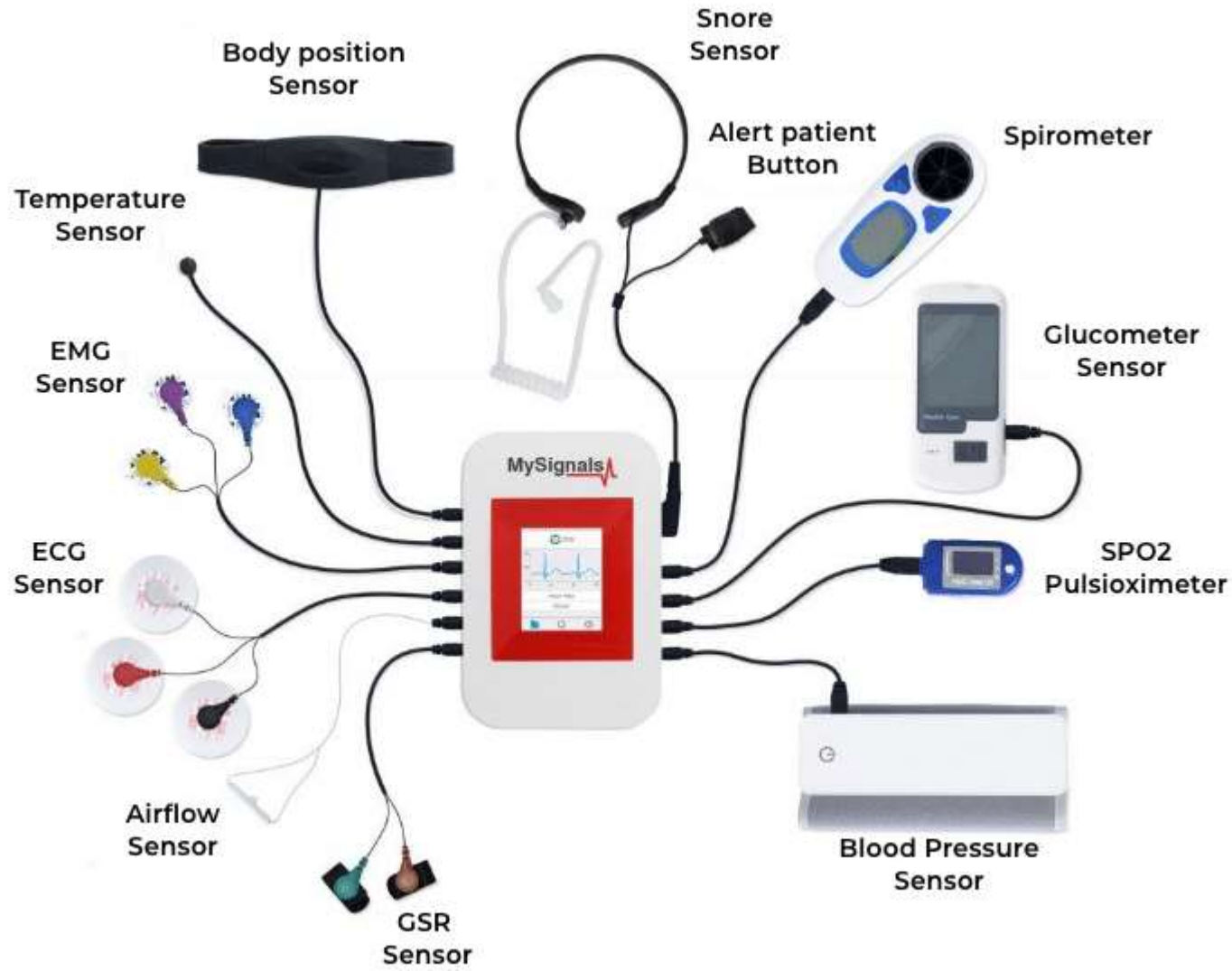
In terms of environmental issues, IoT-based smart farming provides great benefits including: better and efficient water usage, and optimization of inputs and treatments.

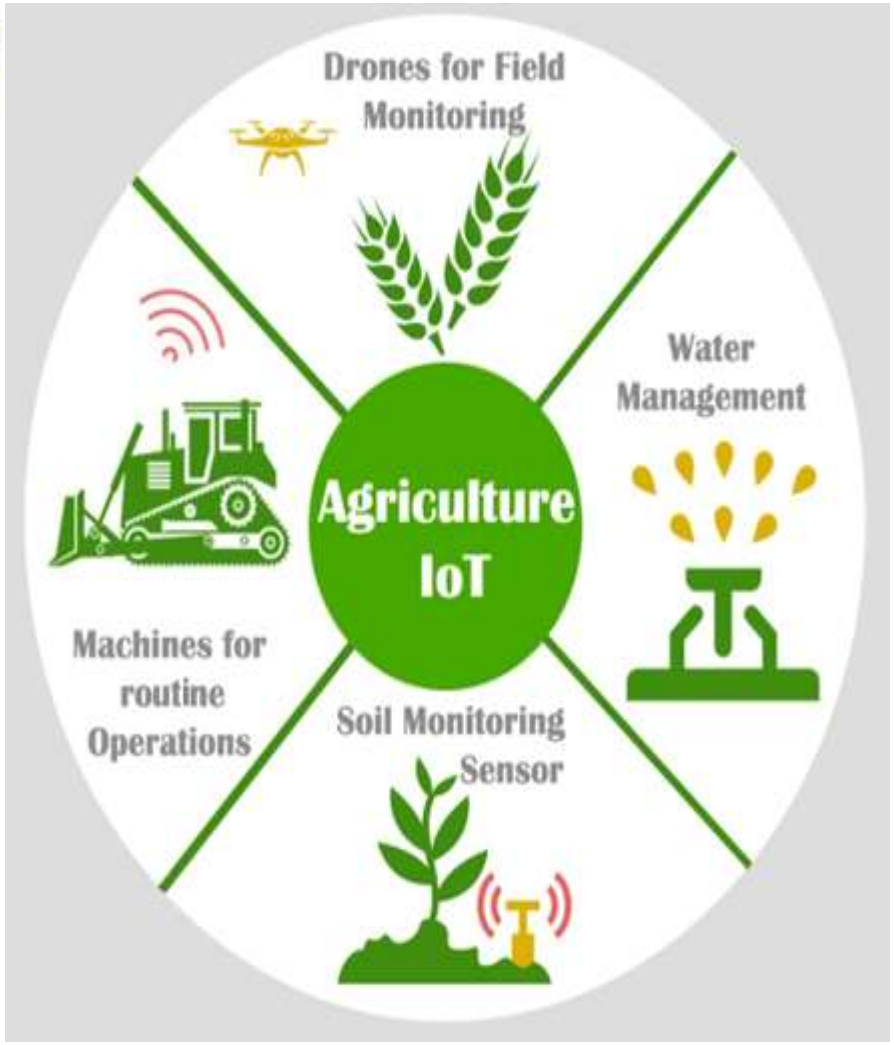
Therefore, smart farming based on IoT technologies enables growers and farmers to reduce waste and enhance productivity.

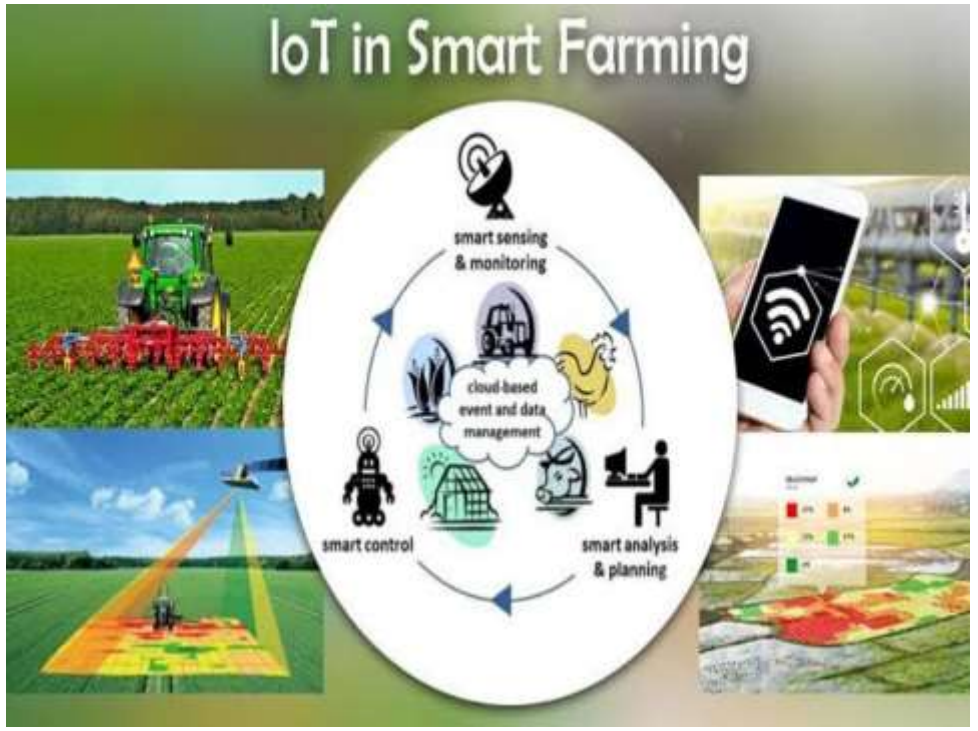
Some of the IoT applications in this area are:

i. Precision farming
ii. Agricultural drones
iii. Livestock monitoring
iv. Smart greenhouses


CONTROL
ROUTER
IOT
SECURITY
RADIATOR
LIGHTING
SMART TV
MUSIC
SMART HOUSE
MICROWAVE
FRIDGE
SOCKET
BLINDS
CAMERA
COFFEE
CLOCK
WASHER


Body position Sensor
Snore Sensor
Alert patient Button
Spirometer
Temperature Sensor
EMG Sensor
Glucometer Sensor
MySignals
ECG Sensor
SPO2 Pulsioximeter
Airflow Sensor
Blood Pressure Sensor
GSR Sensor


Drones for Field Monitoring
Water Management
Agriculture IoT
Machines for routine Operations
Soil Monitoring Sensor


IoT in Smart Farming
smart sensing & monitoring
cloud-based event and data management
smart control
smart analysis & planning


IoT
NPK+

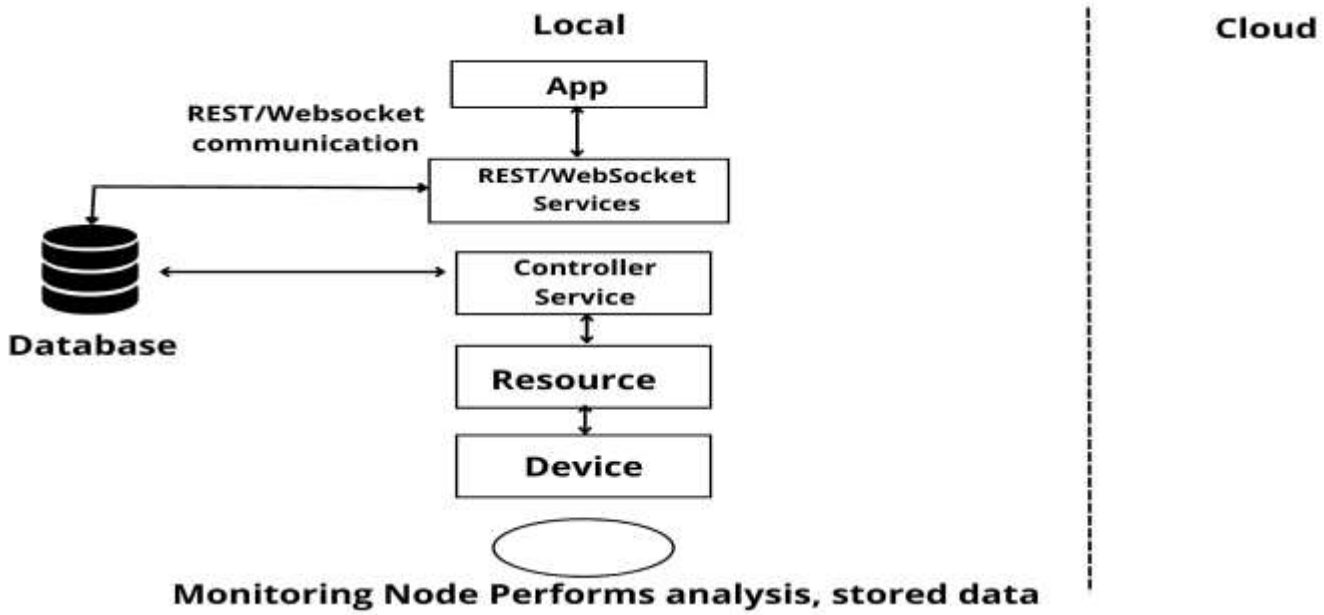
# IoT Levels & Deployment Templates

Developing an **IoT Level Template** system consists of the following components:

1. **Device:** These may be **sensors or actuators** capable of identifying, remote sensing, or monitoring.
2. **Resources:** These are software components on IoT devices for accessing and processing. storing software components or controlling actuators connected to the device. Resources also include software components that enable network access.
3. **Controller Service:** It is a service that runs on the device and interacts with web services. The controller service sends data from the device to the web service and receives commands from the application via web services for controlling the device.
4. **Database:** Stores data generated from the device
5. **Web Service:** It provides a link between IoT devices, applications, databases, and analysis components.
6. **Analysis Component:** It performs an analysis of the data generated by the lol device and generates results in a form which are easy for the user to understand.
7. **Application:** It provides a system for the user to view the system status and view product data. It also allows users to control and monitor various aspects of the IoT system.

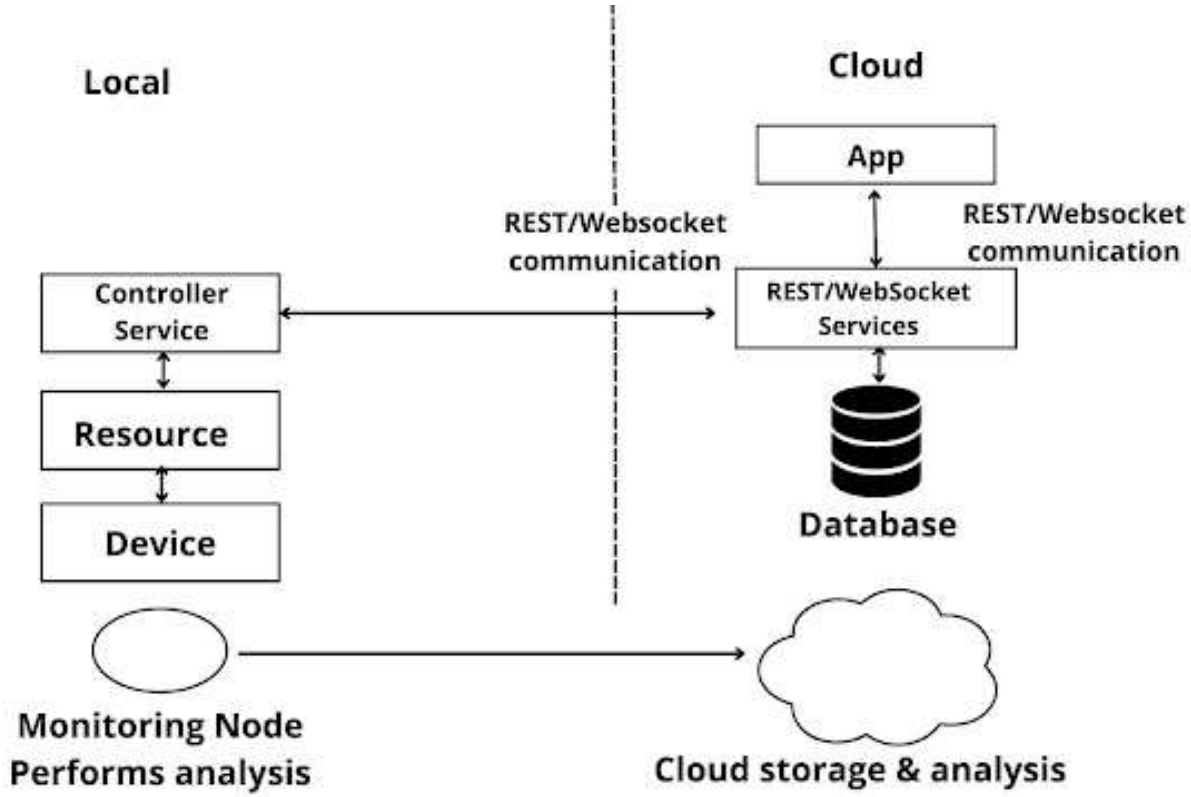
## IoT level 1

IoT system-level-l is the best example for modeling low complexity and low-cost solution where the analysis requirement



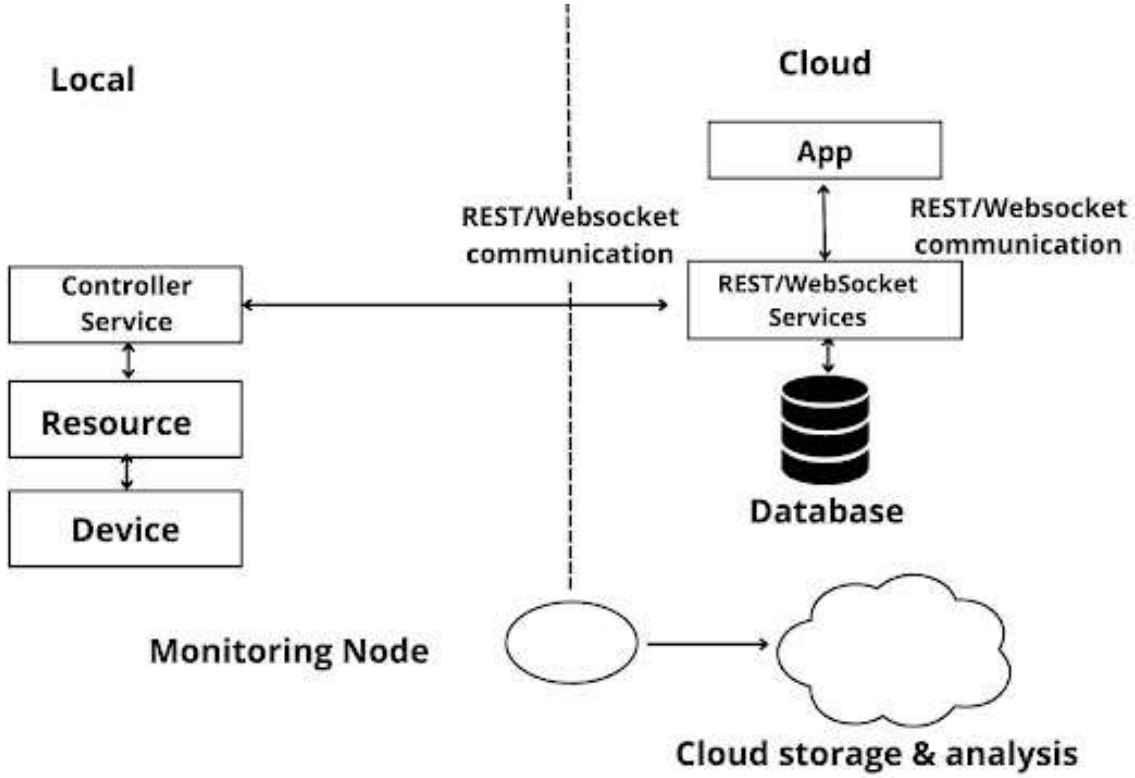
## IoT level 2

A node performs sensing/actuation and local analysis. Data is stored in the cloud. this level is facilitated where the data involved is big and primary analysis is not comprehensive



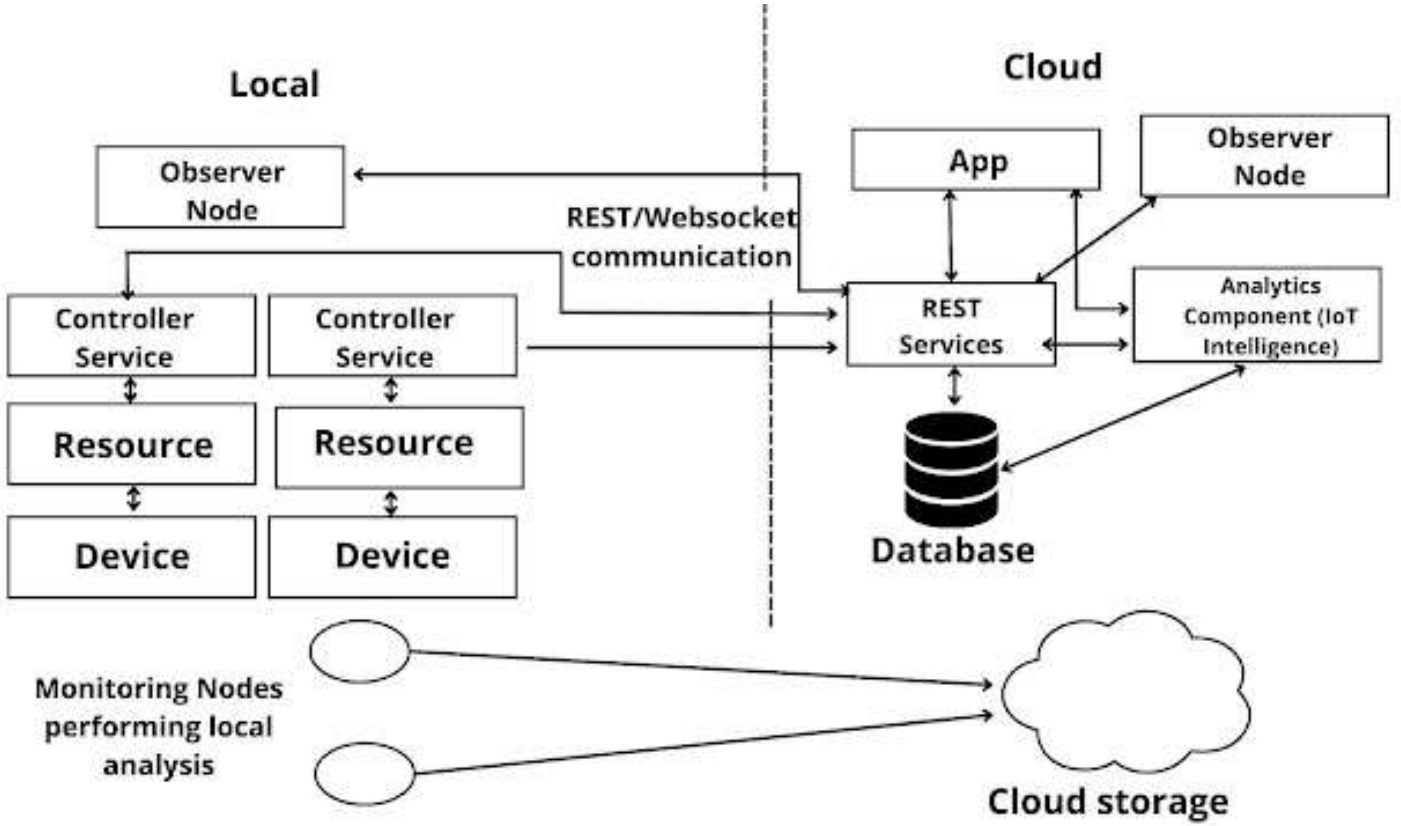
## IoT level 3

At this level, the application is **cloud-based**. A single node monitors the environment and stores data in the cloud. This is suitable where data is comprehensive and analysis 1 computationally intensive.



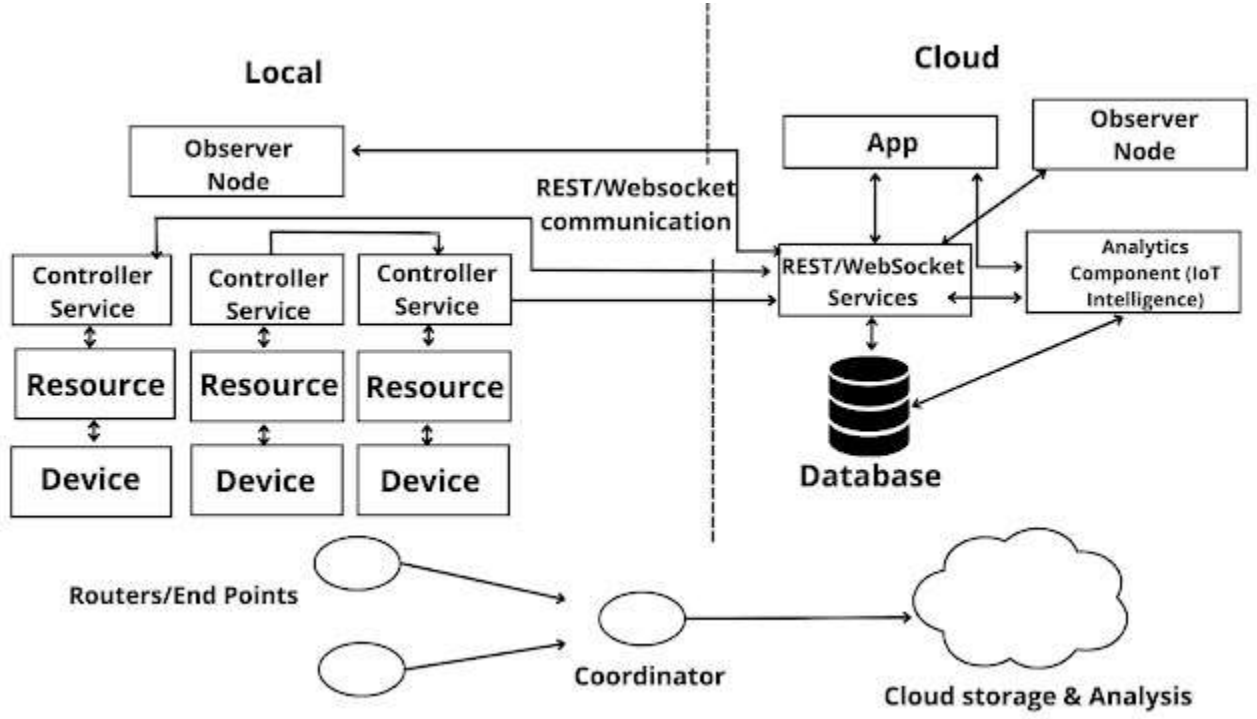
## IoT level 4

At this level, Multiple nodes collect information and store it in the cloud. Local and rent server nodes are used to grant and receive information collected in the cloud from various devices. Observer nodes can process information and use it for applications but not perform control functions, This level is the best solution where **data involvement is big**, requirement analysis is comprehensive and multiple nodes are required,



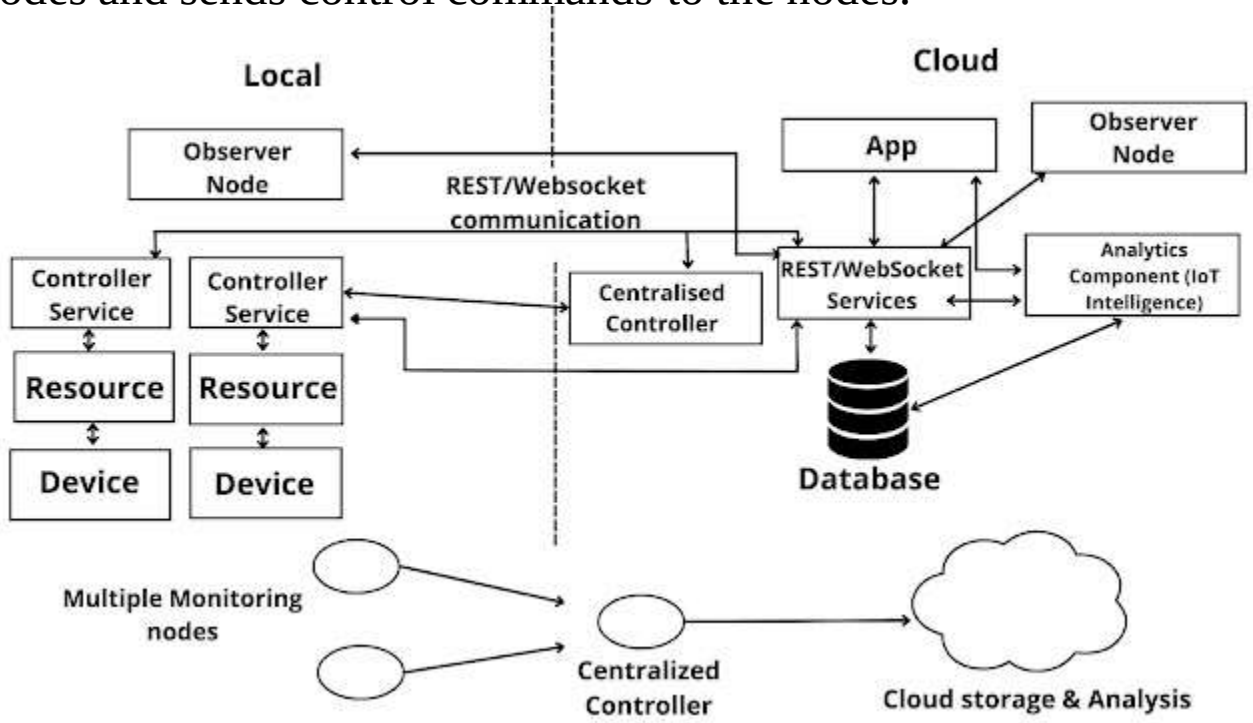
## IoT level 5

In this level Nodes present locally are of two types **end Nodes and coordinator nodes.** End nodes collect data and perform sensing or actuation or both. **Coordinator nodes** collect data from end nodes and send it to the **cloud**. Data is stored and analyzed in the cloud. This level is best for WSN, where the data involved is big and the requirement analysis is comprehensive.



## IoT Level-6

At this level, the application is also cloud-based and data is stored in the cloud-like of levels. Multiple independent end nodes perform sensing and actuation and send d to the cloud. The analytics components analyze the data and store the results in the cloud database. The results are visualized with a cloud-based application. The centralized controller is aware of the status of all the end nodes and sends control commands to the nodes.



# References :

1.Daniel Minoli, Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications, Wiley Publications, First Edition, 2013. (UNIT I-IV)
2. Arsheep Bahga , Vijay Madisetti , Internet of Things: A Hands-On Approach, Universities Press, First Edition , 2014.(UNIT I & V)


Thank You!