



SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore - 641 107

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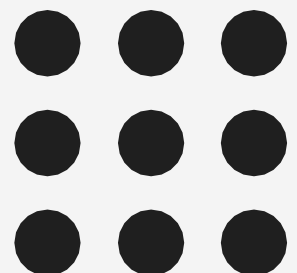
Department of AI & DS

Course Name - 19AD505 Internet of Things & AI

III Year / V Semester

Unit 1 - IoT INTRODUCTION AND APPLICATIONS

Topic 1- Overview and Motivations - IPv6 Role

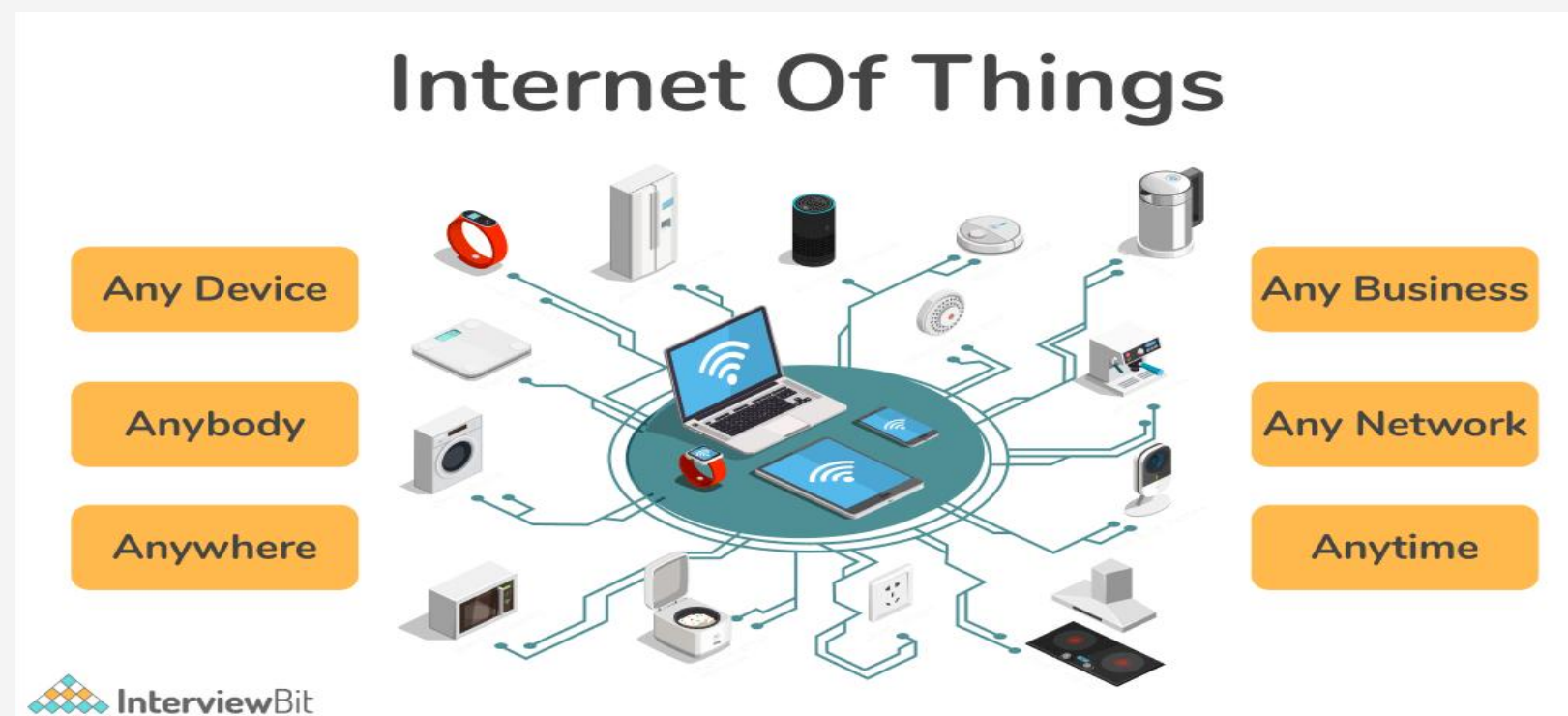


what is IoT

Internet of Things

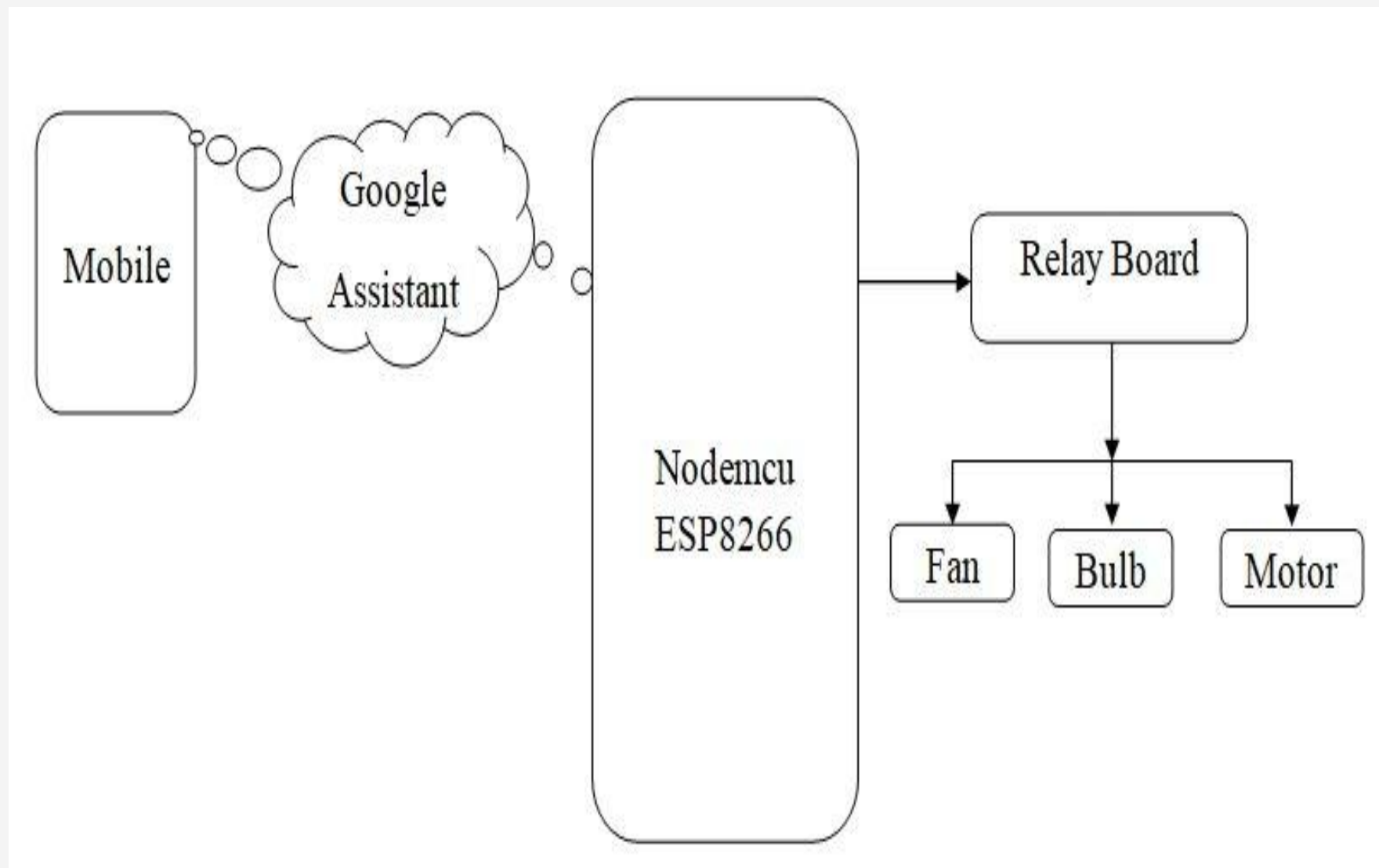
- **IoT**

1. the network of physical objects—“things”
2. That are embedded with sensors, software, and other technologies
3. the purpose of connecting and exchanging data with other devices and systems over the internet.

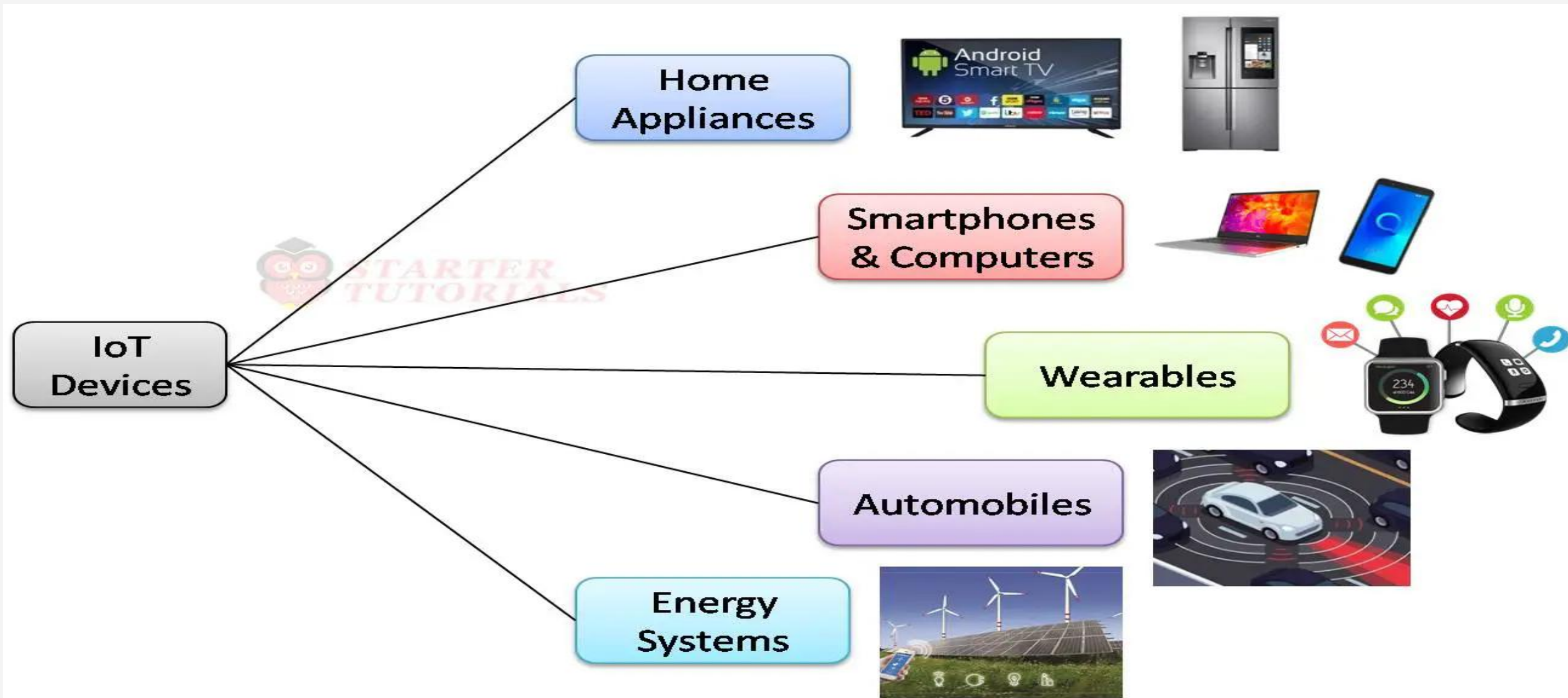


what is IoT

- **example**
 1. Google Home Voice Controller. ...
 2. Amazon Echo Voice Controller. ...



where IoT used



what is AI

- **Ability of computer to think like a human**
- **problem-solving and decision-making capabilities of the human mind.**
- **perform tasks commonly associated with intelligent beings.**
- **the ability to learn and to reason, to generalize**



what is AI

EXAMPLE:

1.WEB SEARCH ENGINES -GOOGLE SEARCH

**2.RECOMMENDATION SYSTEM -
YOUTUBE ,NETFLIX.....**

3.RECOGANIZING HUMAN SPEECH-SRI ,ALEXA

4.ChatGPT

note:

intelligence :This intelligence enables them to study information and make decisions in the same way that a human brain does.

when AI meets IoT

- ✓ **AI-integrated IoT devices can analyze data to reveal patterns and insights and adjust system operations to become more efficient.**
- ✓ **Data can be generated and analyzed to identify points of failure, which enable the system to make adjustments as needed**
- ✓ **example**
- ✓ **The AI and IoT application attempts to gather as much information as possible, mimicking what a person senses. It then applies rules, such as "people can't work where light levels are below x," and, from the conditions sensed and the application of those rules, decides to turn on a light.**



Exercising IoT using AI in the Real World

- ✓ **When a group of connected devices collects and integrates raw data, software programmes with machine intelligence capabilities analyse the data. After a thorough examination, the final result contains useful information.**
- ✓ **Manufacturing Robots**
- ✓ **Autonomous Vehicles- Tesla's self-driving automobiles**
- ✓ **Retail Analytics**

Exercising IoT using AI in the Real World

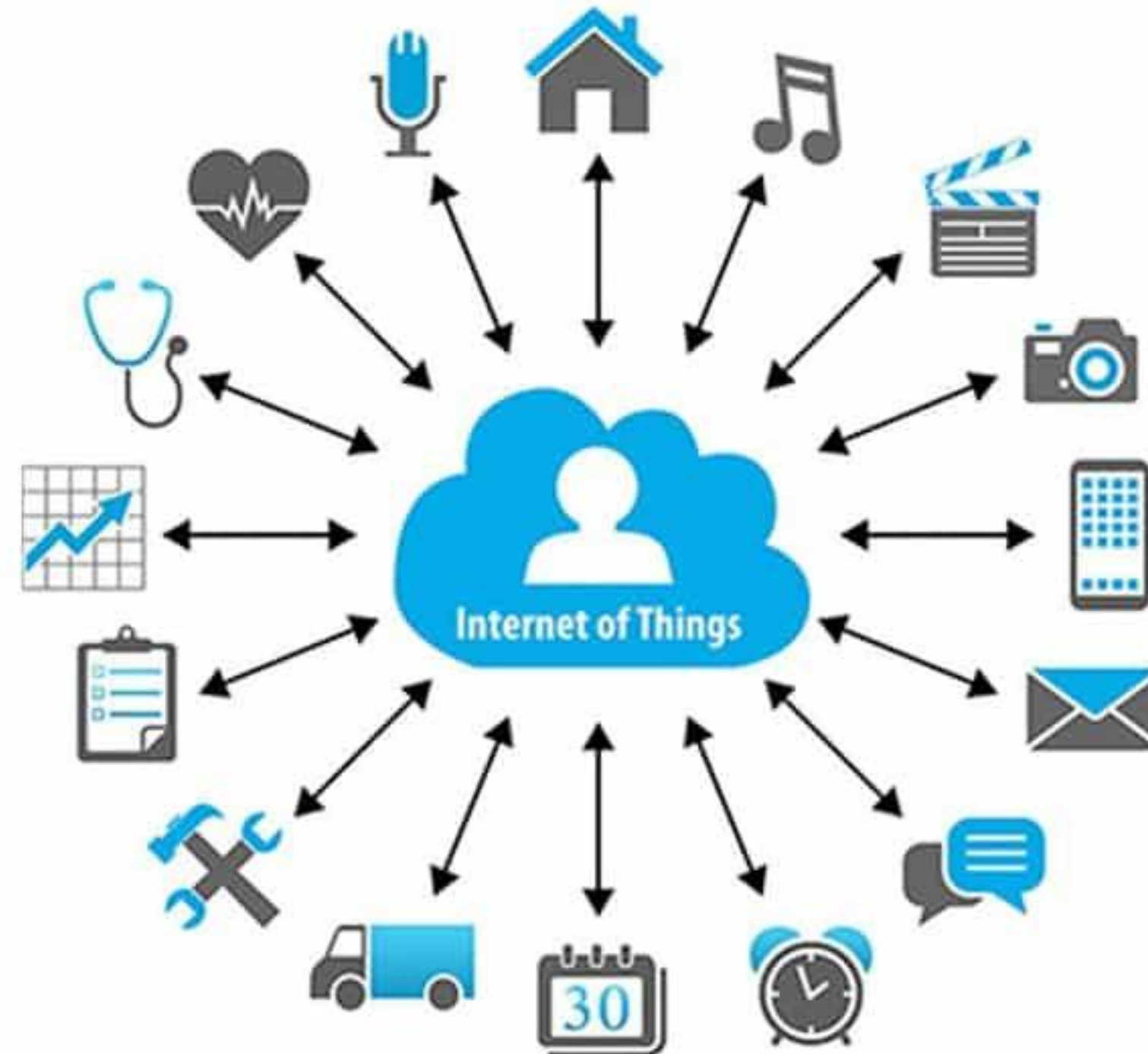




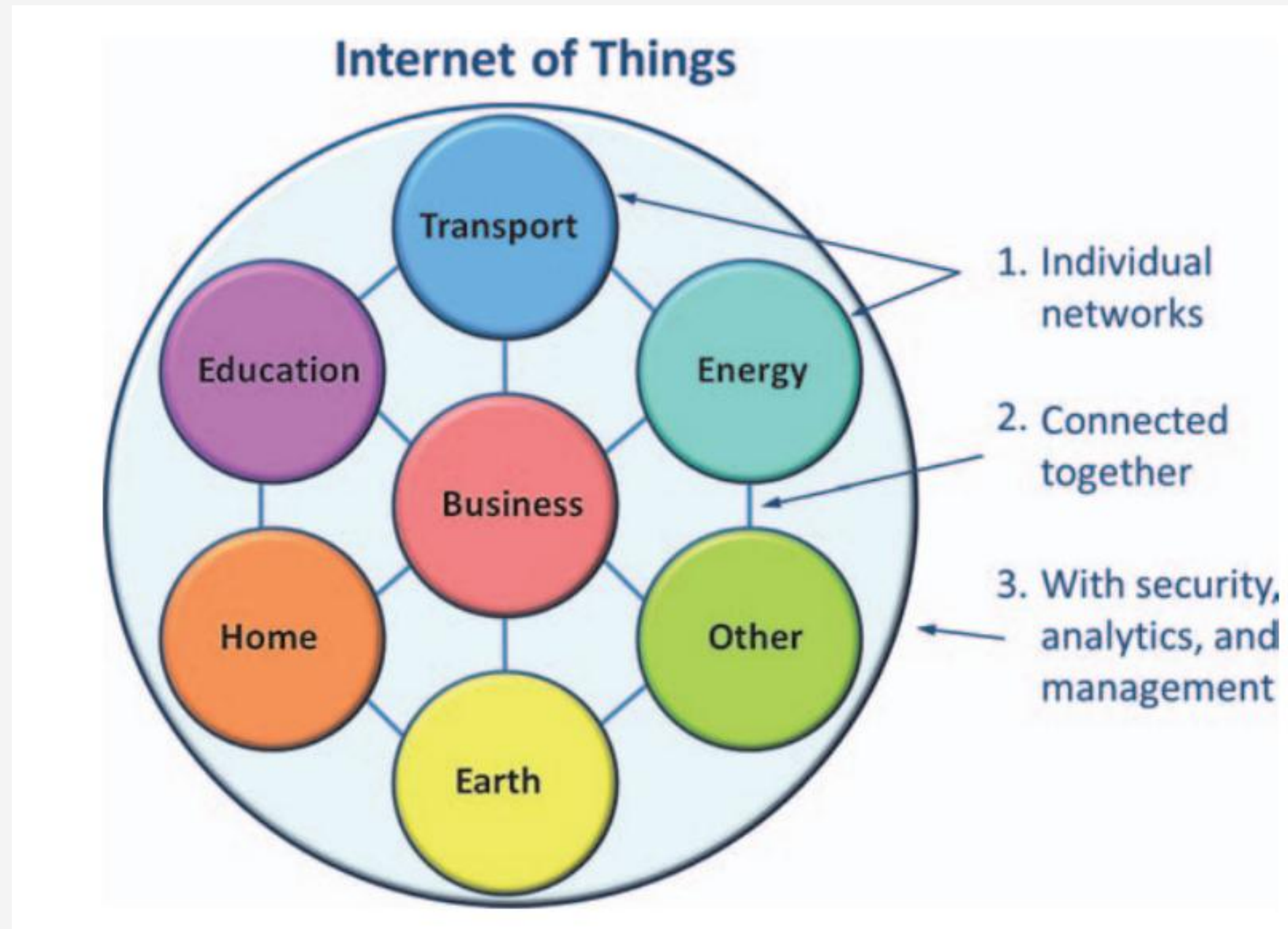
Overview and Motivation

- 1. The goal of the Internet of Things is to enable things to be connected anytime, anyplace, with anything and anyone ideally using any path/network and any service**
- 2. This happens with emergence of cloud computing capabilities -organization can connect thousands or millions of IoT devices to the cloud without need to manage server .**
- 3. IPv6 -unlimited addressing capacity.**

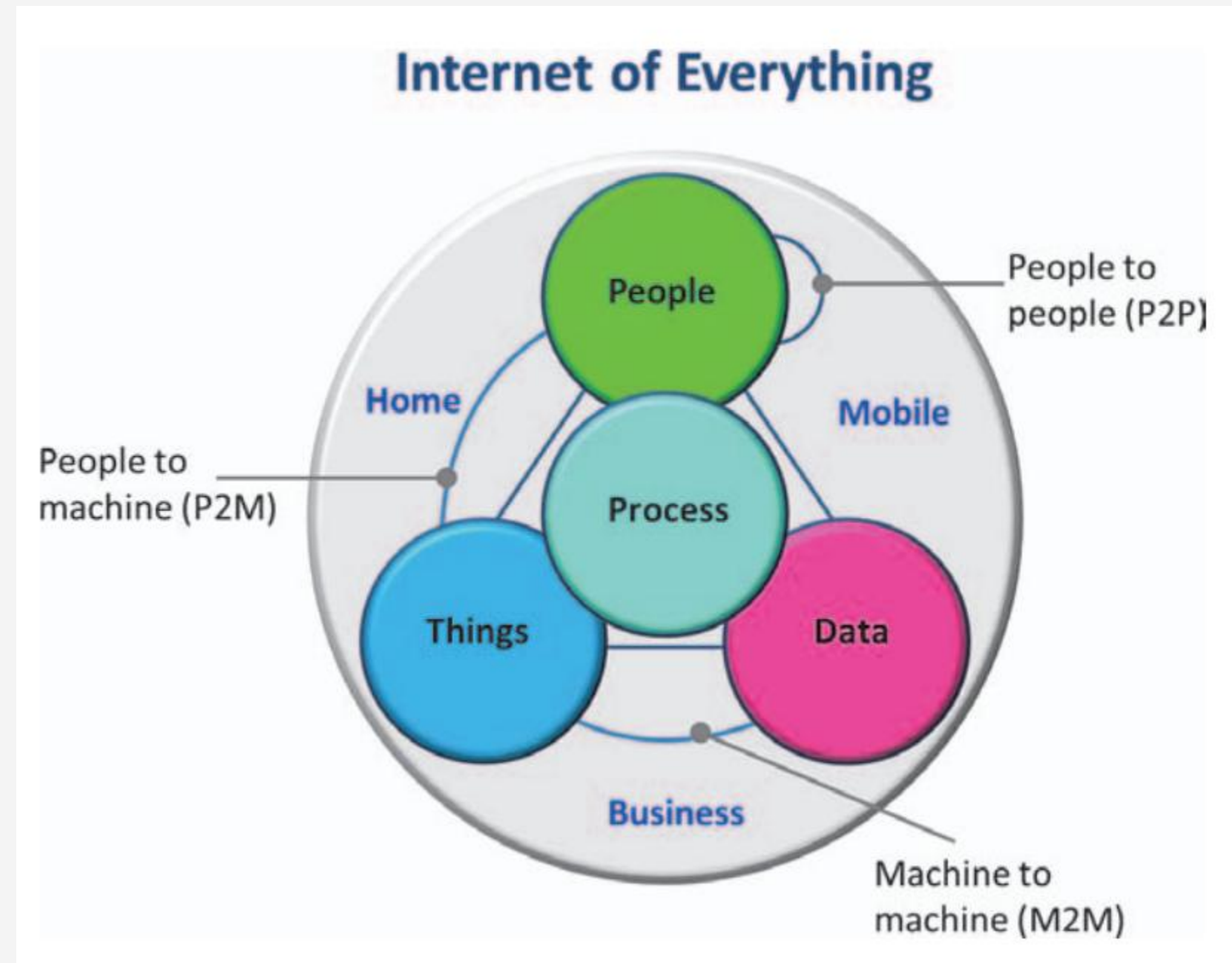
Overview and Motivation



IoT as a network of networks Makes more powerful



The Internet is not only a network of computers, but it has evolved into a network of devices of all types and sizes, vehicles, smartphones, home appliances, toys, cameras, medical instruments and industrial systems, all connected, all communicating and sharing information all the time





Overview and Motivation

The International Telecommunication Union (ITU)

1. It is responsible for coordinating and regulating international telecommunications and global connectivity .
2. they bring a standards for next generation networks (NGN)

NGN:

1. NGN is designed to offer a flexible and scalable platform for delivering various types of multimedia services, including voice, data, video, and interactive communication.



Overview and Motivation

Definition:

“Internet of things (IoT): A global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies.

Characteristics

- **Dynamic and self-Adapting:**
- **Self – Configuring:**
- **Interoperable communication protocols:**
- **Unique Identity:**
- **Integrated into information network**

Overview and Motivation





Overview and Motivation



IOT device

1. unique identities
2. sensing
3. Actuating and
4. monitoring capabilities

Role of IPv6

IPv6-internet protocol version 6

most recent version of the Internet Protocol, which is the underlying protocol used for identifying and communicating with devices on a network. Designed to replace the IPv4 due to the exhaustion of address

IPv4	IPv6
<p>32-Bit Addressing Which Is Able To Support About 4.5 Billion Devices.</p> <p>For example, 192.0. 2.146 is a valid IPv4 address.</p>	<p>128-Bit Addressing. It Supports Approximately 350 Trillion Trillion Devices.</p> <p>An example of an IPv6 address is: 2001:0db8:85a3:0000:0000:8a2e:0370:7334</p>



Role of IPv6

Advantages of IPv6:

1. Expanded Address Space-allowing for a virtually unlimited number of unique IP addresses.
2. Address Format
`2001:0db8:85a3:0000:0000:8a2e:0370:7334`
3. Auto-Configuration
4. Enhance security
5. Simplified Network Management



Advances of IPv6

“Plug-and-play”: IPv6 includes a “plug-and-play” mechanism that facilitates the connection of equipment to the network.

Mobility: IPv6 includes an efficient and robust mobility mechanism namely an enhanced support for mobile IP, specifically, the set of mobile IPv6



THANK YOU