# *IoT Ecosystem*

*CSI 421-Internet Of Things*

*Universitas Esa Unggul*

- *IoT Ecosystem*

- **Semua Bahan mengacu kepada buku :** The Internet of Things: Enabling Technologies, Platforms, and Use Cases [Pethuru Raj, Anupama C. Raman]

# the IoT ecosystem

- There is no standard architecture for the IoT ecosystem. In this chap- ter, we have de ned a reference architecture, and we have used this architecture throughout this chapter. It is a ve-layered architecture and the di erent layers are as follows:
- Objectslayer
- Objectabstractionlayer
- Service management layer
- Applicationlayer
- Businesslayer

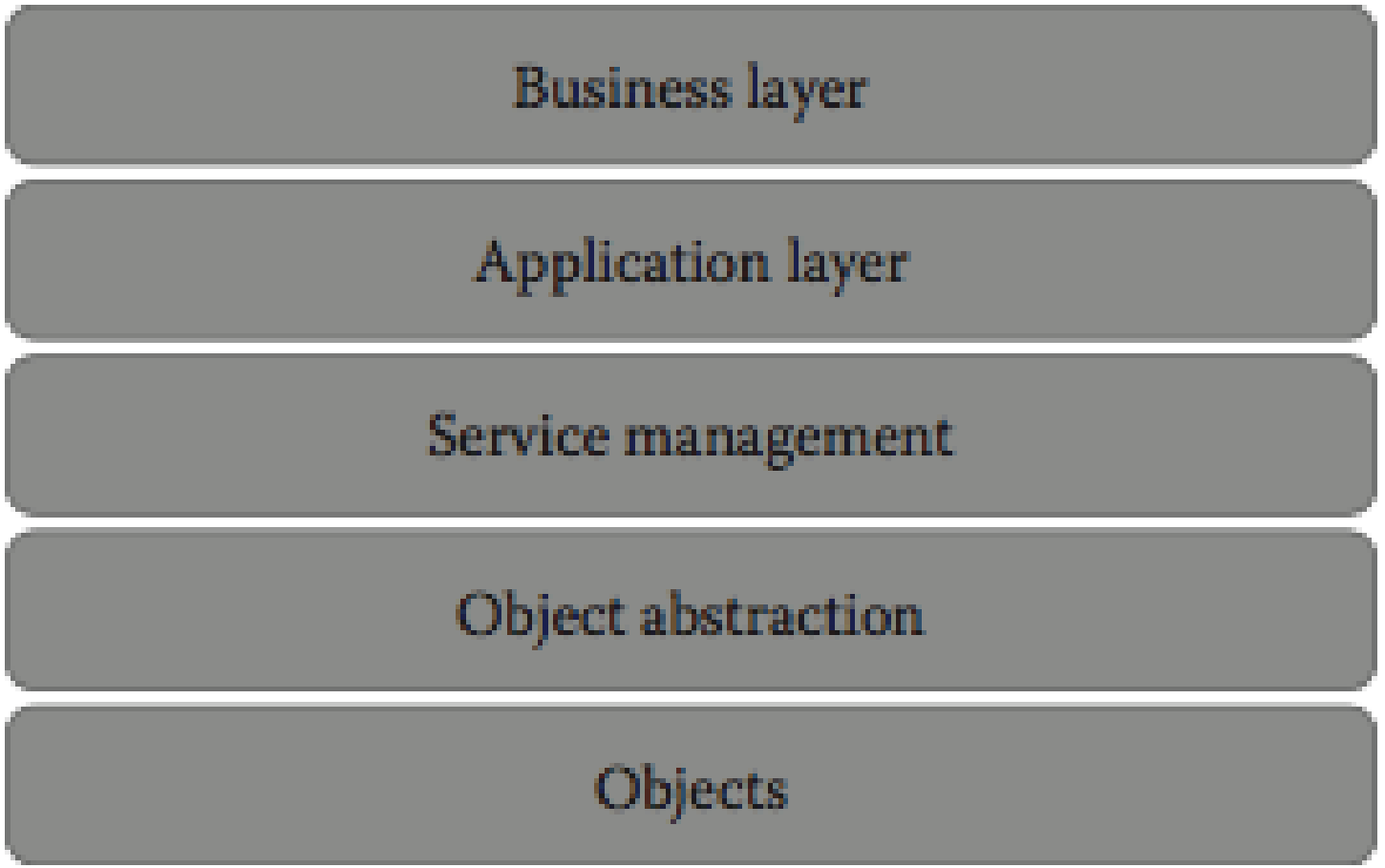
The main protocols that we have tried to de ne for the infrastructure layer are the following:

- ■ RPL ■ IEEE802.15.4 ■ 6LoWPAN
- ■ Bluetooth low energy ■ EPCglobal
- ■ LTE-A ■ Z-Wave ■ ZigBee

three prominent service discovery protocols that are used for IoT devices:

- DNSservicediscovery(DNS-SD)
- Multicast domain name system (mDNS)
- Simple service discovery protocol (part of UPnP)

# Layered Architecture for IoT



# *Objects Layer*

- Objects layer, also known as devices layer, comprises the physical devices that are used to collect and process information from the IoT ecosystem.
- Physical devices include di erent types of sensors such as those that are typically based on micro-electromechanical systems (MEMS) technology.

# *Object Abstraction Layer*

This layer transfers data that are collected from objects to service management layer using secure transmission channels. Data transmission can happen using any of the following technologies:

- RFID
- 3G
- GSM
- UMTS
- Wi-Fi
- Bluetooth low energy
- Infrared
- ZigBee

# *Service Management Layer*

- This layer acts as middleware for the IoT ecosystem.
- This layer pairs speci c services to its requester based on addresses and names.
- This layer provides exibility to the IoT programmers to work on di erent types of heterogeneous objects irrespective of their platforms.

# *Application Layer*

- This layer provides the diverse kinds of services requested by the customer.
- The type of service requested by the customer depends on the speci c use case that is adopted by the customer.
- Some of the prominent IoT verticals are as follows:
  - Smartcities
  - Smart energy
  - Smarthealthcare Smart buildings or homes
  - Smart living
  - Smart transportation
  - Smart industry

# *Business Layer*

- This layer performs the overall management of all IoT activities and services.
- This layer uses the data that are received from the network layer to build various components such as business models, graphs, and flowcharts.
- This layer also has the responsibility to design, analyze, implement, evaluate, and monitor the requirements of the IoT system.