

Robotics and Internet of Things (IoT)

Topic 1:

Introduction to the Internet of Things and Robotics

Topic 1. Introduction to the Internet of Things and Robotics

Content of this Topic:

- 1.1 Robotic: Definition, Benefits and Challenges
- 1.2 Internet of Things Definition, Benefits and Challenges
- 1.3 History of Internet of Things (IoT) and Robotics



1.1 Robotics: Definition, Benefits and Challenges

The aims of this topic are to provide you with a comprehensive understanding of Robotics and IoT and its functionality



1.1 Robotics: Definition, Benefits and Challenges

What is a robot?

Broad definition: “Mechanical or virtual systems capable of performing tasks autonomously or semi-autonomously”

- Hard to define because of the various different types of robots
- can be used in order to treat diseases, land on mars or make pancakes

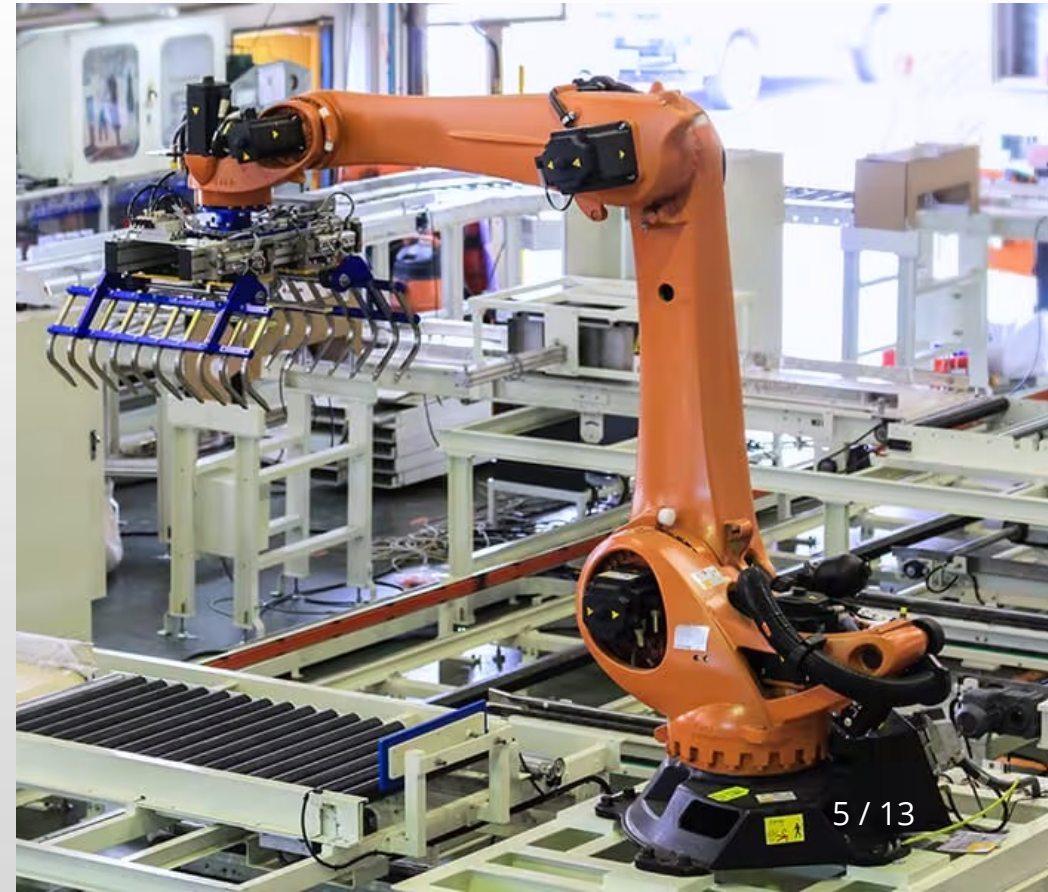


1.1 Robotics: Definition, Benefits and Challenges

Benefits of robotics:

Industrial robotics

- to automate repetitive tasks
- high speed
- high precision
- low error rate
- 24/7 ready for operation
- no wage, tax and ancillary wage costs
- no downtime due to staff shortages



1.1 Robotics: Definition, Benefits and Challenges

Benefits of robotics:

Medical robotics

- In surgery to perform procedures
- In diagnostics
- In healthcare
- Assisting nursing teams
- Assisting medical teams



1.1 Robotics: Definition, Benefits and Challenges

Benefits of robotics:

Agriculture robotics

- to automate tasks such as planting
- automate detection of weed
- automate harvesting
- preparation of the crop
- Soil preparation



1.1 Robotics: Definition, Benefits and Challenges

Benefits of robotics:

Logistics robotics

- to transport
- sort goods
- store goods
- space-saving



1.1 Robotics: Definition, Benefits and Challenges

Benefits of robotics:

Military and security robotics

- Dealing with dangerous goods
- Use in hazardous situations
- Defuse bombs



1.1 Robotics: Definition, Benefits and Challenges

Challenges of robotics

Socio-economic Risks:

- Job Displacement
- Inequality

Technical and Security Risks:

- Privacy and Security, Safety,
- Dependence on Technology

Ethical and Environmental Risks:

- Ethics and Dehumanization
- Environmental Impact



1.2 Internet of Things Definition, Benefits and Challenges

What is the Internet of Things (IoT)?

- A network of physical object “things”, that are embedded with sensors, software, and other technologies
- Purpose: connecting and exchanging data with other devices and systems over the internet



1.2 Internet of Things Definition, Benefits and Challenges

Benefits:

- Connected cars,
- Smart home
- Connected security systems
- Smart agriculture
- Connected retail
- Connected healthcare monitors
- Connected manufacturing equipment
- and many others



1.2 Internet of Things Definition, Benefits and Challenges

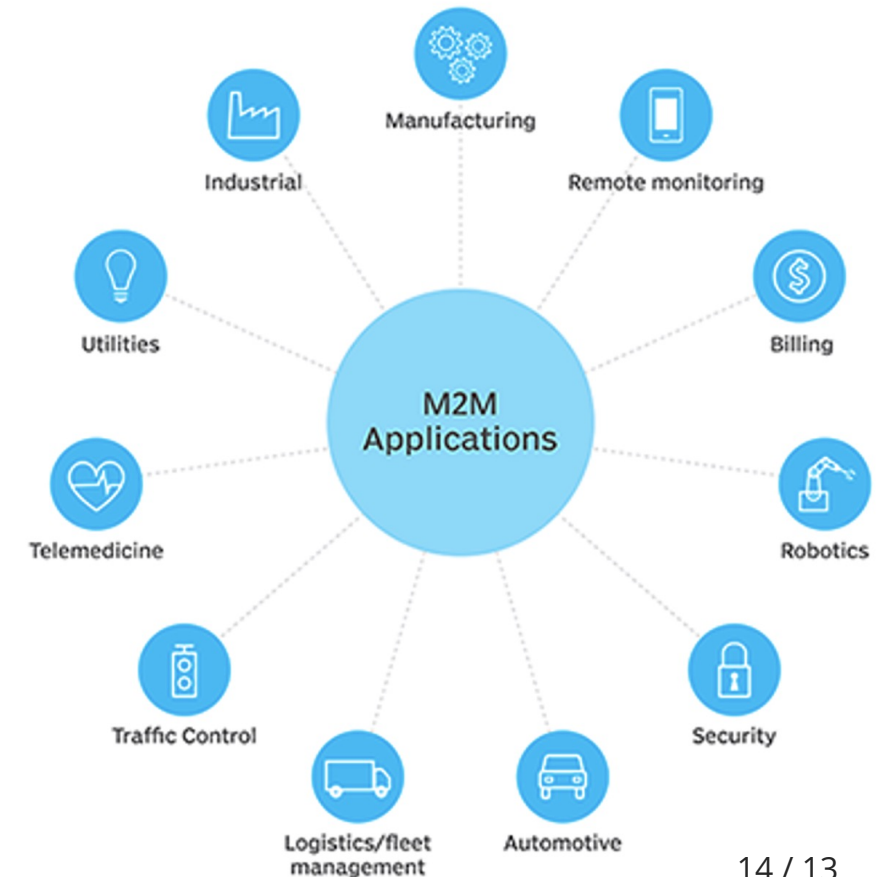
Challenges:

- Not everyone has the same access to IoT technologies
- Issues with transparency and consent
- Data can cause privacy issues
- Risks of cyberattacks

1.3 Historical evolution of Robotics and Internet of Things

Machine-to-Machine, or M2M

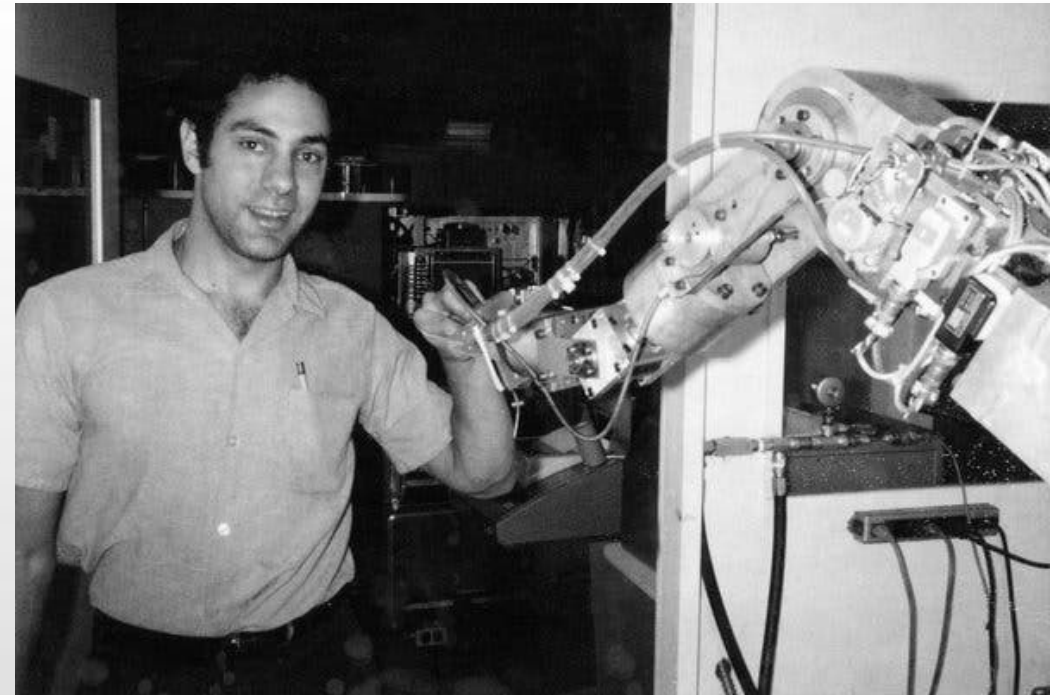
- Machine-to-Machine, or M2M, refers to devices talking directly to each other
- Example: telemetry in telephone lines or radio waves since the beginning of the last century
- Idea of networked devices has been around since the 1970s



1.3 Historical evolution of Robotics and Internet of Things

Evolution of Robotics until 1990s:

- People in the ancient Greece already built machines that performed simple tasks
- During the 1970s and 1980s the first robotic arms were developed and used in manufacturing and laboratories.
- In the 1990s Robots became more intelligent and were able to perform more complex tasks.



1.3 Historical evolution of Robotics and Internet of Things

Evolution of Robotics in the 21st century

- Humanoid robots
- Working in homes, in hospitals, in factories or in our space
- Honda's "ASIMO" humanoid robot can walk, run and climb



1.3 Historical evolution of Robotics and Internet of Things

Evolution of Robotics in the 21st century

- Popular robot vacuum cleaner
- Engineered by iRobot



Thank you for attention