



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with
'A++' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University,
Chennai



DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT213- IoT SYSTEM ARCHITECTURE

II ECE / IV SEMESTER

UNIT 1 – BASICS OF INTERNET OF THINGS

TOPIC 3 –Technological trends in IoT



Future of IoT Technology: Trends



- 5G and Edge Computing
- Artificial Intelligence (AI) and Machine Learning (ML)
- Blockchain
- Low-Power Wide-Area Networks (LPWAN)
- Digital Twins
- Cybersecurity
- Focus on Sustainability:



5G and Edge Computing:



- Imagine a world where self-driving cars communicate instantly with traffic lights, and smart factories adjust production in real-time based on sensor data. That's the power of 5G and edge computing!
- 5G provides the speed and low latency needed for this real-time data exchange, while edge computing processes data closer to devices, reducing delays and maximizing efficiency.



Artificial Intelligence (AI) and Machine Learning (ML)



- AI and ML are like the brains of the IoT, enabling devices to learn, analyze data, and make decisions autonomously. This allows for predictive maintenance, optimized resource allocation, and even personalized user experiences.
- For example, imagine a smart thermostat that learns your heating preferences and adjusts automatically, or a healthcare device that predicts potential health risks based on sensor data.



Blockchain



- Blockchain offers secure and transparent data management, crucial for sensitive IoT applications like supply chain tracking and financial transactions. It ensures data integrity and fosters trust between various parties involved in the IoT ecosystem. Imagine tracking the journey of a product from farm to table, verifying its authenticity and origin every step of the way, thanks to blockchain technology.



Low-Power Wide-Area Networks (LPWAN):



- LPWANs connect devices over long distances with low power consumption, ideal for remote and sparsely populated areas. This enables applications like environmental monitoring, asset tracking, and smart agriculture. Imagine sensors in remote fields sending data about soil moisture and weather conditions to a central hub, informing irrigation decisions and optimizing crop yields.



Digital Twins



- Digital twins are virtual replicas of physical assets and processes. They allow for simulations, optimization, and remote monitoring, improving efficiency and reducing downtime. Imagine creating a digital twin of a power grid to simulate potential scenarios and optimize energy distribution, or a digital twin of a building to monitor its energy consumption and identify areas for improvement.



Cybersecurity



- As more devices connect and data is generated, robust cybersecurity measures are essential. This includes data encryption, secure authentication, and vulnerability patching to protect user privacy, ensure data integrity, and prevent cyberattacks. Imagine securing smart home devices from unauthorized access or protecting sensitive healthcare data transmitted through medical IoT devices.



Focus on Sustainability

- IoT technologies are increasingly used to optimize energy usage, monitor environmental conditions, and promote sustainable practices. This includes smart grids for efficient energy distribution, smart agriculture for water conservation, and connected waste management systems. Imagine smart buildings that adjust heating and lighting automatically based on occupancy, reducing energy consumption.