

# IoT fundamentals

## ECE 3501

Introduction

By

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# Syllabus

# Module-I & II

- IT-ITeS/BPM Industry – An Introduction, the relevance of the IT-ITeS sector, **Future Skills – An Introduction**, General overview of the Future Skills sub-sector
- Evolution of IoT and the trends, Impact of IoT on businesses and society, Existing IoT use cases and applications across industries.

# Future Skills – An Introduction

- NASSCOM Future Skills is an industry driven learning eco system **to get India accelerated on the journey to become the global hub for talent in the emerging technologies.**

# IT-ITes Eco System

- NASSCOM the premier Trade Body and Chamber of Commerce for the IT-ITes industry has launched a new initiative to scale quality capacity and increase the groundswell of talent for this industry.
- NASSCOM has set up the IT-ITES Sector Skills Council NASSCOM (SSC NASSCOM) under the aegis of the National Skills Development Corporation (NSDC). SSC NASSCOM an integral part of NASSCOM is recognised as the Skills Standards setting body under GOI.
- The key objective of SSC NASSCOM is to scale quality capacity, to have a ready **deployable talent pool (certified Job Ready) with the least amount of intervention from industry**. To start with, our focus will be on jobs at the Entry level.
- In this endeavour, unique Job Roles / Qualification Packs at Entry; Middle and Leadership levels have been identified which require different levels of educational qualifications.

# Follow the Link

- <https://www.sscnasscom.com/>

# JOB Roles skills from the FUTURE

- 3D printing
- Virtual Reality
- BlockChain
- Cloud Computing
- Robotic Process Automation
- Cyber Security
- Internet of things
- Artificial Intelligence
- Mobile Tech

# Definition & various scenarios

IoT Introduction



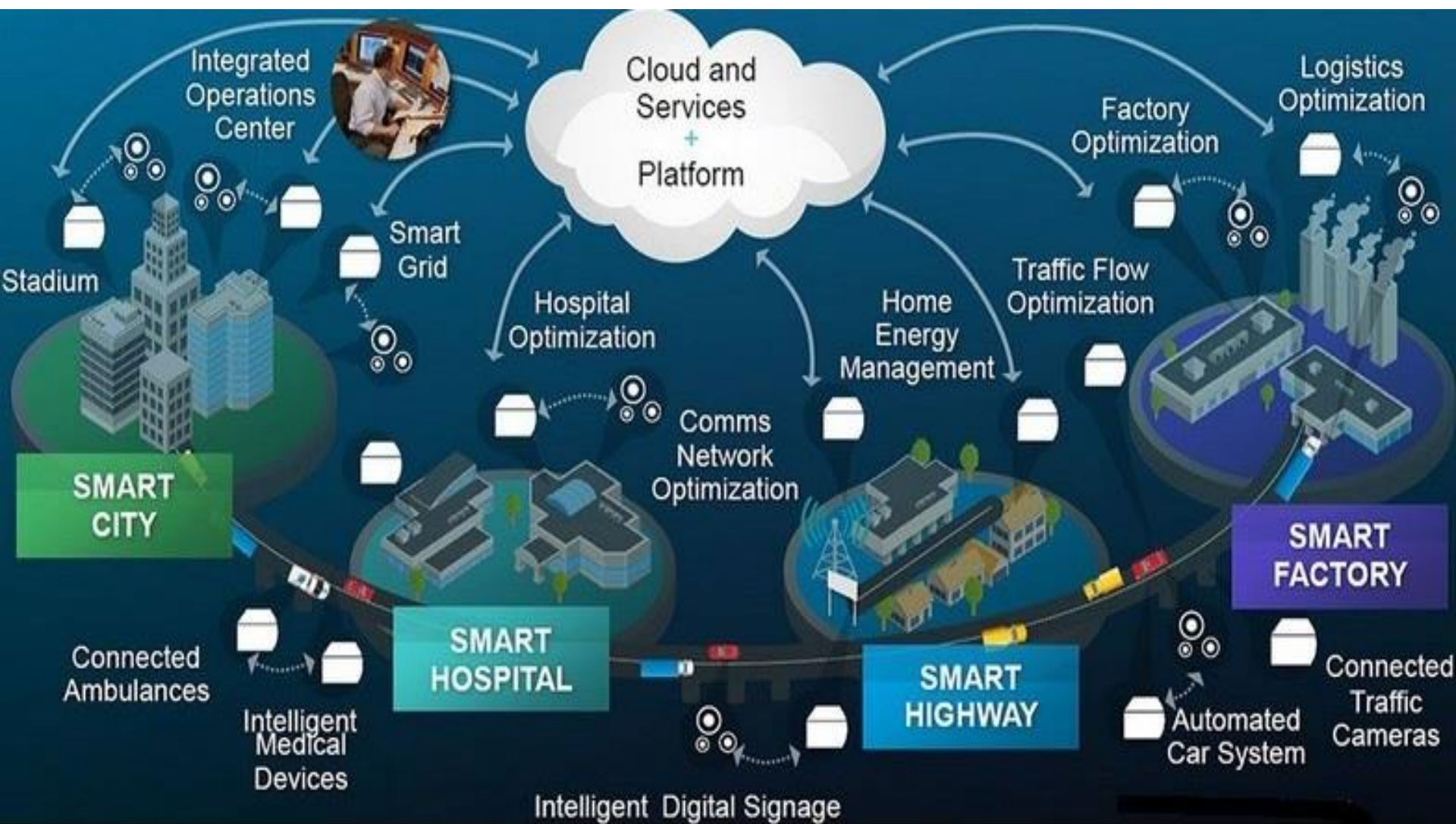
# Introduction to IoT

- Accelerating change in almost every area
  - Political, financial, economic, climate or technological.
- Internet of Things revolution
  - the advancement in technology
  - completely change the way we all live and work.
  - enabling increased connectivity of everyone, everything, everywhere and every time, is causing a fundamental shift in how we do things.
  - allows objects to be sensed or controlled remotely
  - they are integrated across existing network infrastructure.
  - result in creating opportunities for integration of the physical world into computer-based systems and resulting in improved efficiency, accuracy and economic benefit.
  - reduced human intervention

# Definition

- The Internet of Things (IoT) is the networking of physical devices ("connected devices" or "smart devices")
- It is embedded with electronics, soft wares, sensors, actuators and network connectivity that enable these objects to collect and exchange data.
- *The International Telecommunication Unit (ITU) defines Internet of Things (IoT) as*
  - *“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”*





- A true end-to-end IoT Platform is a software framework that remotely connects all
  - 'things',
  - manages devices,
  - collects data,
  - allows action management,
  - analytics and visualization
  - and integrates with cloud services

- IoT comprises things that have **unique identities** and are **connected to the internet**.
- The focus on IoT is in the **configuration, control and networking** via the Internet of devices or things that are **traditionally not associated with Internet**.
- Not limited to just connecting things to the internet, **allowing things to communicate** and **exchange data** while executing meaningful applications.

# What made possible in IoT?

- Smart Inventory Management system
  - Let us imagine a large grocery store owner, who requires a reminder whenever the stock of a category of grocery goes below a predefined level. He needs to decide on the order levels, lead-time and the stock to be maintained. Fast moving items, slow moving items, stagnant items have a direct bearing on this.
- The process will be laborious and time-consuming and prone to human errors and delays.

# How IoT work for Grocery Store(Solution)

- Let us say that containers of the grocery type are fitted with a sensor, say a load cell, to sense the weight of the container with the contents. Imagine this data is transported through the Internet from a hub which is integrating the sensor data and generating a report on anticipated shortages and giving pointers based on the history to highlight fast moving, slow moving and stagnant items.
- This can help him in the investment strategy, ordering periodicity, optimizing the stock, avoiding stocks going stale or crossing the date of expiry and so on.



# Example Scenarios

- **Scenario 1:** People are granted access to offices, theatres or even their own homes by waving their wrists at the doorway.
- **Scenario 2:** A home owner can control the temperature and humidity of the rooms of the home, or set the microwave oven to prepare his/her dinner even before reaching home from miles away.
- **Scenario 3:** A car that can pay for its fuel, identify the quickest route to the destination, manoeuvre traffic and locate a parking space at the destination all by itself.
- **Scenario 4:** The refrigerator can take its inventory, knows what to order and sends an automated signal to the local grocery store.
- **Scenario 5:** Our smartphones can receive alerts about the smoke managing from the kitchen and send a message to the fire department.
- **Scenario 6:** Motors and other machinery in a manufacturing plant can communicate its wear and tear parameters to the maintenance staff on its own.

# Actual Industrial Topology Model

