SMART CITY: AN IoT APPROACH

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Smart City

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SMART CITY CONCEPT

Smart City & Concept

➢ A smart city is a city with a high level of connectivity, computing, and data processing

➢ The connectivity may be physical, meaning that various devices are connected to the internet

➢ The computational connectivity could be each other, in a virtual space and online

➢ The data processing could be in the digital format to share each communication nodes

❖ Internet of Things (IoTs)

❖ Machine-to-Machine Communication

❖ Device-to-Device Communication

❖ Artificial Intelligence

❖ Big data handling

❖ Embedded Technologies

❖ Voice activation sensors

❖ Electronic devices for data collection

Three Layers Concept of Smart City

SMART CITY

First Layer-Technological Based
This includes sensors and smartphones connected via a high-speed communication network

Second Layer-Application Layer
Applications are used to convert raw data into useful insight, create alerts and take action with tools created app developers and technological providers

Third Layer-City Usage Based
In this layer the technology is absorbed and used by companies and people at a city level or higher.

Offering of Smart Cities

The Major offering of Smart cities are

❑ Improved Quality of Life

❑ Better public safety

❑ Better health system

❑ Sustainable Environment

❑ Easier management of traffic

❑ Economic development

❑ Better energy, water, and waste management

Internet Of Things

Internet of Things (IoTs) describes the network of physical objects (things) that are embedded with sensors, software, and other technologies for the purpose of concerning and exchanging data with other devices and systems over the Internet. In other means digital internet-connected devices those have the capacity to interact with each other or another internet-enabled device/

Why is IoT important?

➢ Easy connectivity within home appliances, cars, thermostats, baby monitors with the internet via embedded devices, seamless communication is possible between people, processes, and things.

➢ Low-cost computing, cloud, big data, analytics, and mobile technologies, physical things can be share and collect data with minimal human intervention.

➢ In this hyper connected world, digital systems can be record, monitor, and adust each interactions between connected things.

IoT
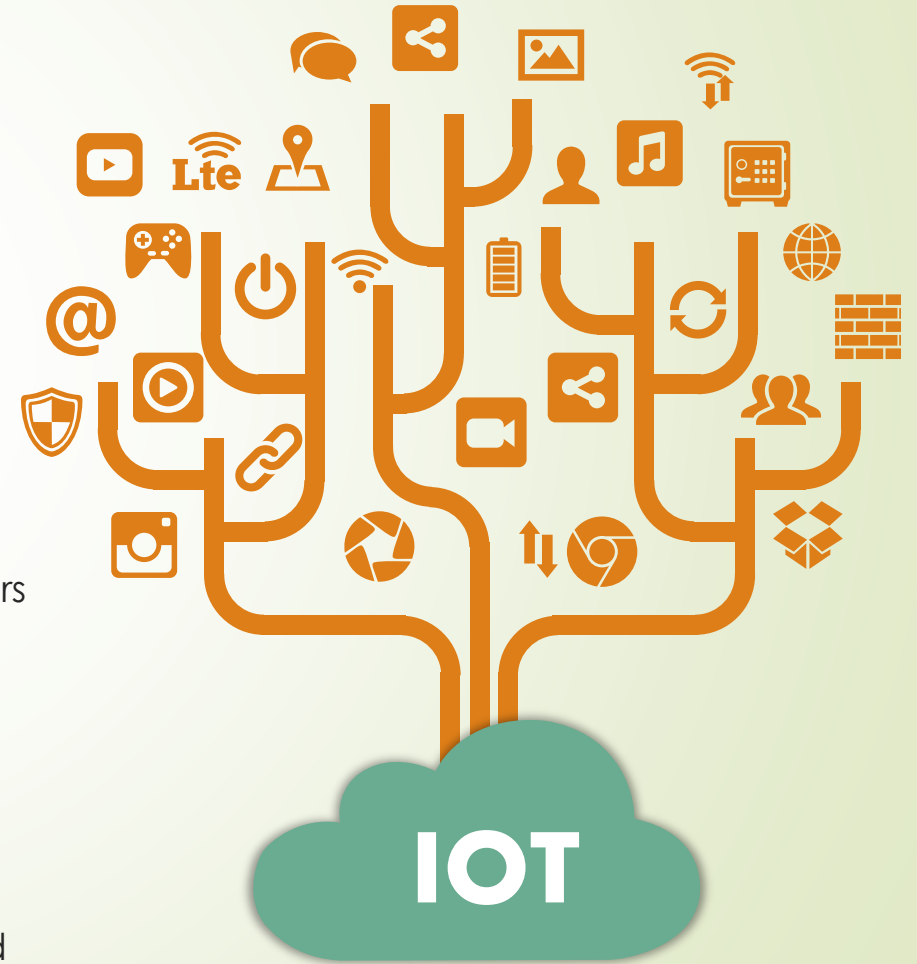
Technologies have made IoT Possible

Access to low-cost, low-power sensor technology

Affordable and reliable sensors are making IoT technology possible for more manufactures.

Cloud Computing Platforms

The increase in the availability of cloud platforms enables both business and consumers to assess the infrastructure they need to scale up without actually having to manage it all.

Connectivity

A host of network protocols for the internet has made it easy to connect sensors to the cloud and to other things for efficient data transfer.

Machine Learning and Analytics

With advances in machine learning and analytics, along with access to varied and vast amounts of data stored in the cloud, businesses can gather insights faster and more easily. The emergence of these allied technologies continues to push the boundaries of IoT and the data produced by IoT also feeds these technologies.
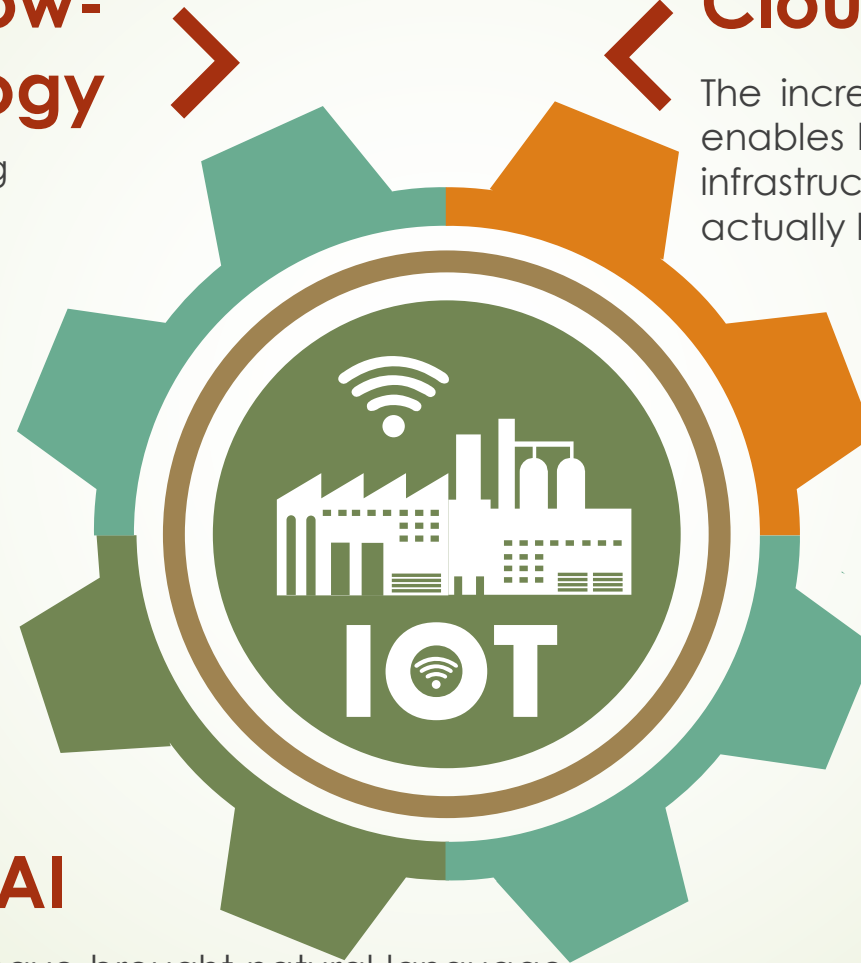
Conversational AI

Advances in neural networks have brought natural-language processing (NLP) to IoT devices (such as digital personal assistants Alexa, Cortana, and Siri) and made them appealing, affordable, and viable for home use.

Real-World Applications of IoTs in Smart Cities

❖ Smart Parking

❖ Public Safety

❖ Waste Management

❖ Utility Management

▪ Energy Management

▪ Smart Lightning

▪ Water Management

❖ Remote Monitoring

❖ Environmental Well-being

❖ Public Transport

IoTs Approach

IoT for Safety and Security

IoT security (internet of things security) is the technology segment focused on safeguarding connected devices and networks in IoT. IoT involves adding internet connectivity to a system of interrelated computing devices, mechanical and digital machines, objects, animals and people.

CCTV Surveillance

Intelligent video surveillance systems can easily search IoT device data to identify environmental changes, and easily find the location of different IoT devices and their corresponding videos on maps.

Industrial Internet of Things (IIoTs)

Machine-to-machine (M2M) communication, big data, and machine learning, the IIoT enables industries and enterprises to have better efficiency and reliability in their operations.

Cybersecurity

Cyber security is essential in the IoT because one threat or hack could disrupt the network or worse, give a cyber criminal complete access to the entire system. In industries such as defense or military operations, the IoT houses extremely sensitive information. If the IoT is accessed via a weak network point or vulnerable device, hackers then have the ability to retrieve intelligence or cause physical damage to the entire network.

Smart Home

One of the most significant advantages of IoT devices in smart homes is their ability to conserve energy. IoT-enabled devices like smart thermostats, lighting systems, and appliances can be programmed to operate more efficiently, reducing energy waste and lowering utility bills.

IOT

Smart Transportation System

IoT-based ITS (IoT-ITS) makes easy transport services using interconnected mobile devices to ensure real-time data communication and remote access. It enables real-time data management regarding driver activity, optimized routes, fuel consumption analysis, and other reasons.
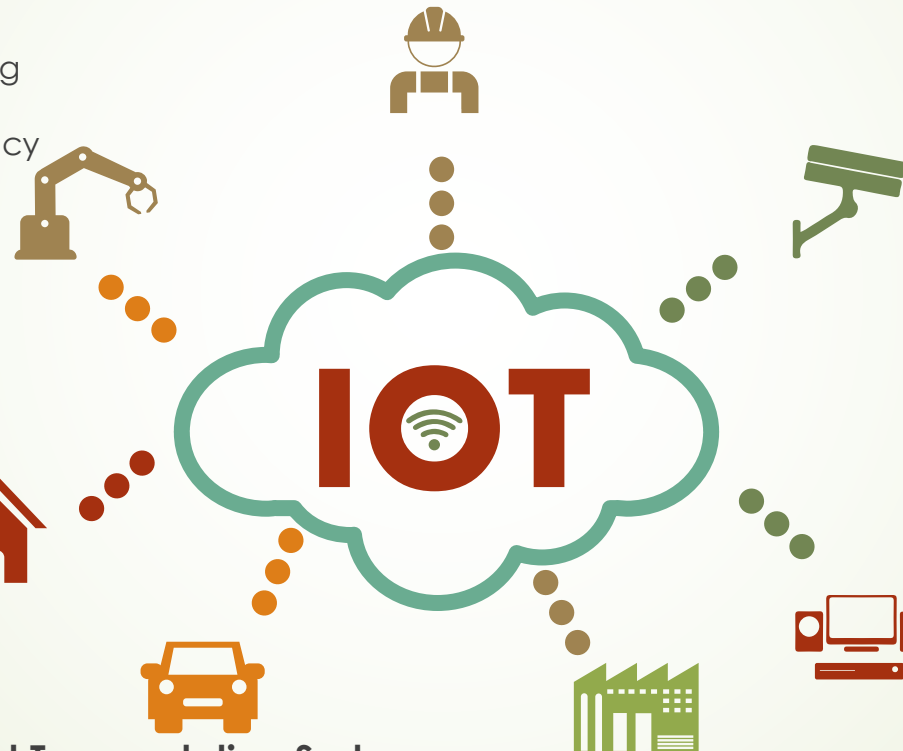
Smart Cities

For data collection and analysis, smart cities use IoT devices such as connected sensors, lights, and meters. Some of the technologies are AI, cloud computing, machine learning, etc. The cities use these technologies to gather information to enhance infrastructure, public utilities, and services, among other things.

Smart City Component

Smart Homes
Smart Homes involve the use of sensing units installed throughout a person's home that provide information about the home as well as its occupants. These sensors might include user activity monitors such as ambient sensors, motion trackers and power/energy consumption.

Smart Transportation
Vehicle to Vehicle (V2V), Vehicle to Infrastructure (V2I), Vehicle to Pedestrian (V2P) or Pedestrian to Infrastructure (P2I), such technologies have made the design of smart transportation systems possible.

Smart Industry
The Industry 4.0 paradigm entails the vision of a connected factory where all its intermediary functionaries are seamlessly integrated, working in tandem with each other. This is made possible because of the Internet of things

Smart Infrastructure
The infrastructure of a city is paramount to its living quality, city governments need to construct new bridges, roads and buildings for the use of its inhabitants and also perform maintenance for uninterrupted usage.

Smart ENERGY
one-way energy flow from a main generator source, usually a hydroelectric or fossil fuel based power plant. Power generation is controlled via feedback from the substations.

Smart CITY COMPNENET
The collection of data is application dependent and has been a real driver for sensor development in the various domains.

Smart Agriculture
Smart agriculture isthe use of sensors embedded into plants and fields to measure various parameters to helpin decision making and prevent/diseases, pests.

Smart HEALTH
To improve health care availability and quality and reducing the overall costs as well as burden on healthcare facilities.

Smart City Services
Smart city services encompass the activities that sustain a city's population, theseinvolve municipal tasks such as supply of water, waste management, environmental controland monitoring etc.

Smart City Challenges

Security and Privacy

Cybercrime and warfare have become a tactic in world politics, smart cities are at an ever-greater risk of being the target of such malicious attacks. Encryption of data transmitted over the network is necessary in this scenario.

Big Data Analytics

The data and continuously improve the services that are delivered in smart cities, new data analytics algorithms need to be developed.

Networking

Current networking methods are not optimized to providing networking services for smart city components. Many devices in smart cities have mobility and data throughput requirements which need to be met to provide an acceptable quality of service.
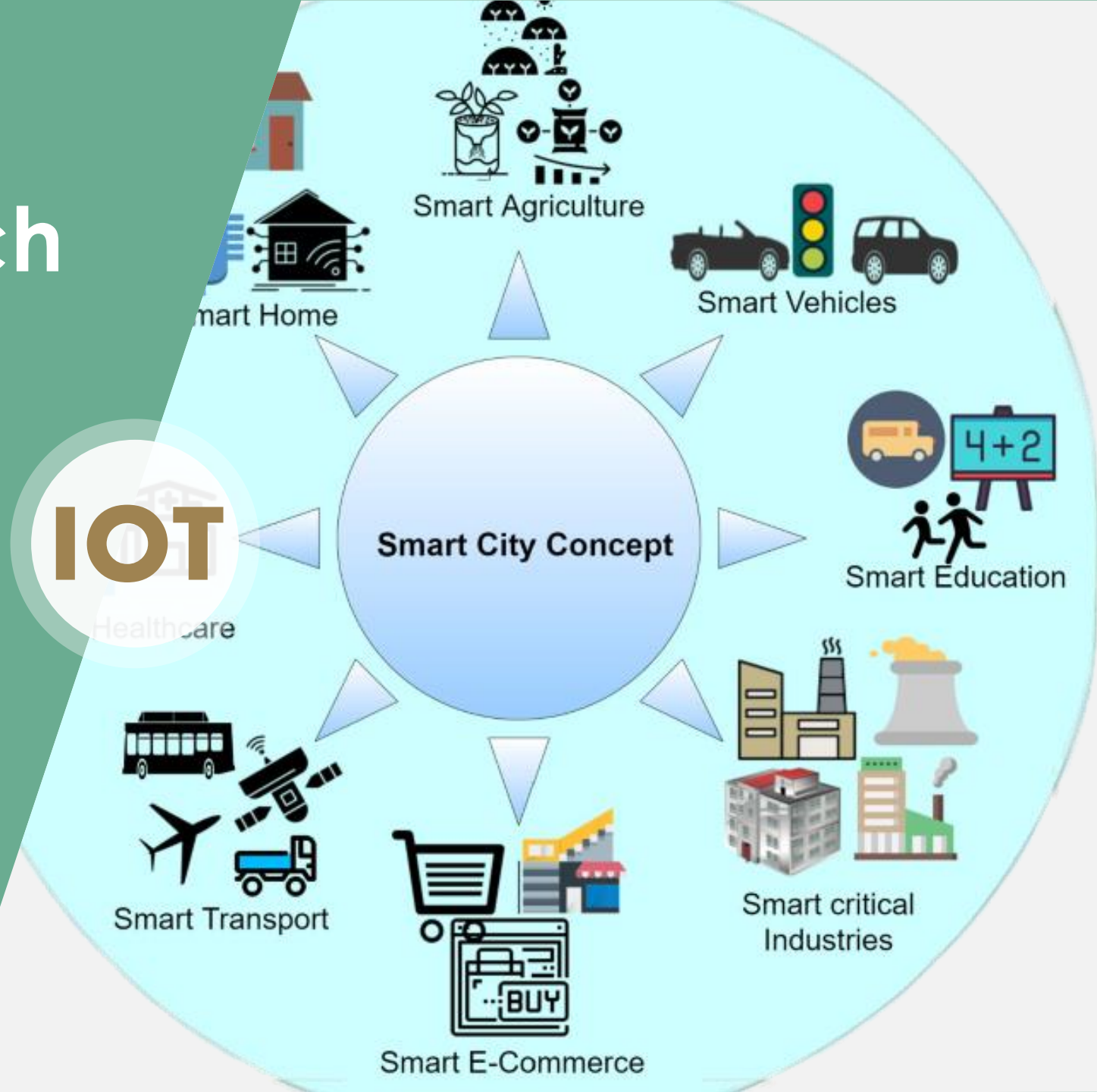
Smart Sensors

Sensors provide the knowledge and data from which smart city innovations are created. With the vastly different nature of Smart City projects and its various components, there are numerous sensors which are used as part of these initiatives.

SMART CITY CHALLENGES

SMART CITY :
An IoT Approach

The current situation in the world of IoT, it's safe to assume that we are going to see more and more smart cities in the future. As we could see, IoT not only makes city management much easier and more efficient, but it also increases the quality of life of it's inhabitants.

THANK YOU