

INTERNET OF THINGS

ASSIGNMENT-1

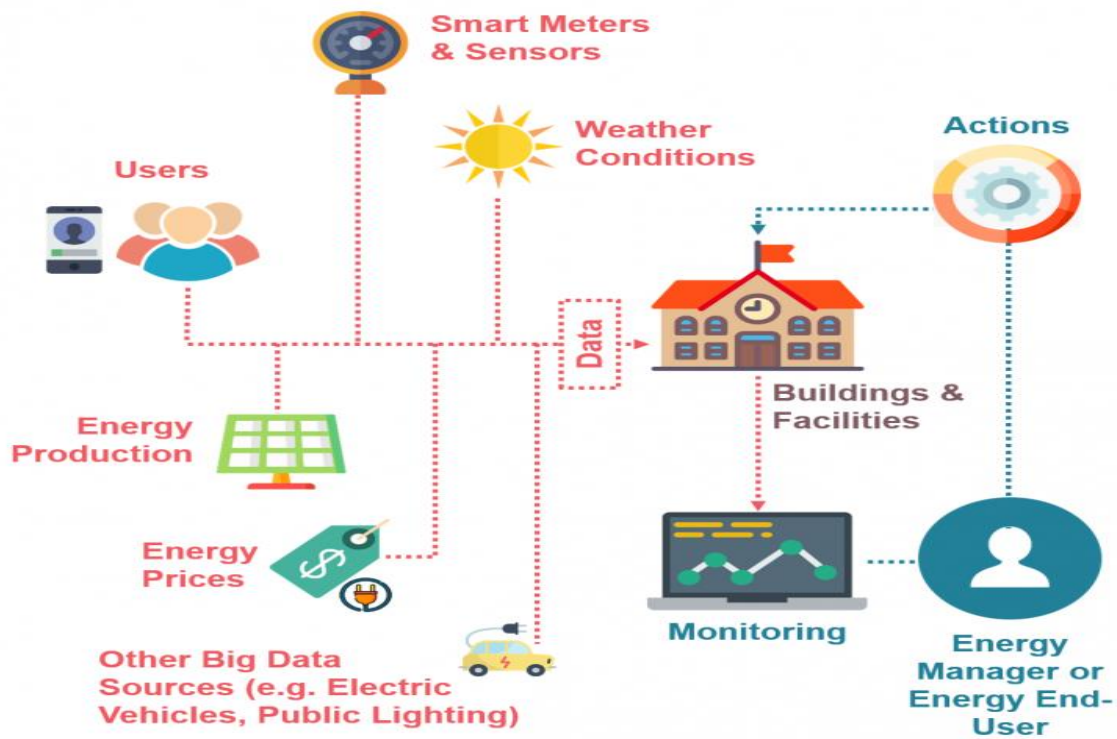
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List out 20 use cases of Internet of things?

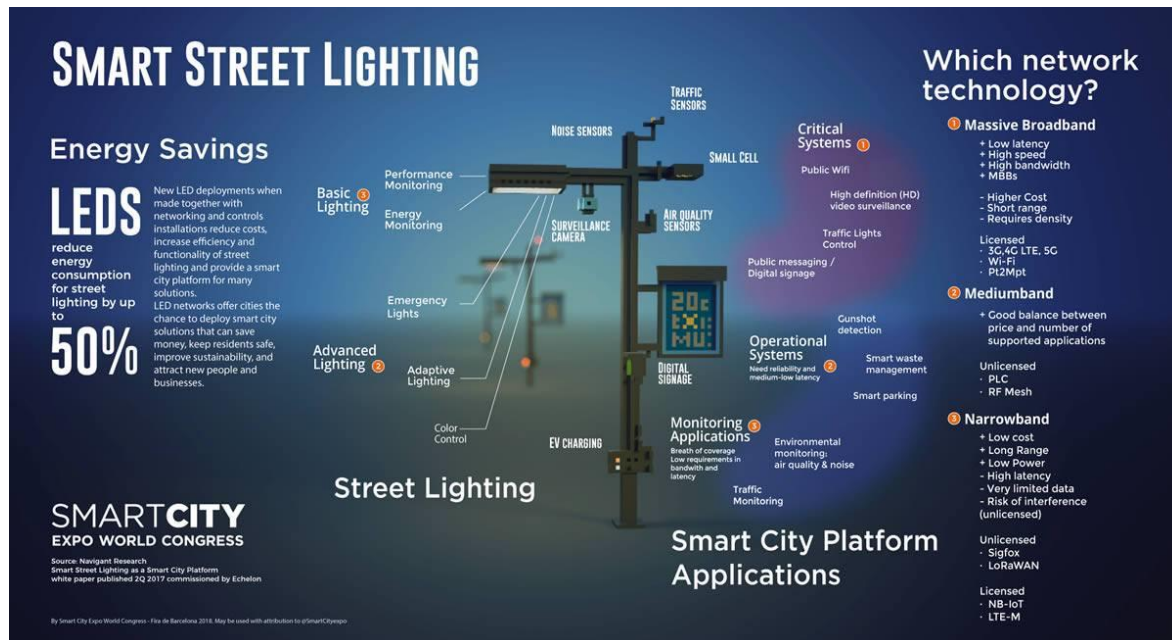
1) Energy Management:

IoT devices can help manufacturers manage energy consumption based on real-time data collected from devices. Intelligent energy management systems reduce energy bills, operational expenditures and carbon footprint of the factory while increasing energy efficiency.



2) Smart lighting:

Smart lighting is made up of street lighting with IoT sensors. Sensors collect data about the condition of traffic and pedestrians. With that data, street lights provide optimum lighting so that street lighting systems can save up to 80% of the energy.



3) Waste Management:

IoT sensors can monitor fill levels for conventional bins and send the data to the relevant department of the city hall. With that information, the garbage truck routes can be optimized for trash collection. Machine learning methods can also be implemented in IoT sensors so that sensors can predict the fill levels of containers by learning from historical data.

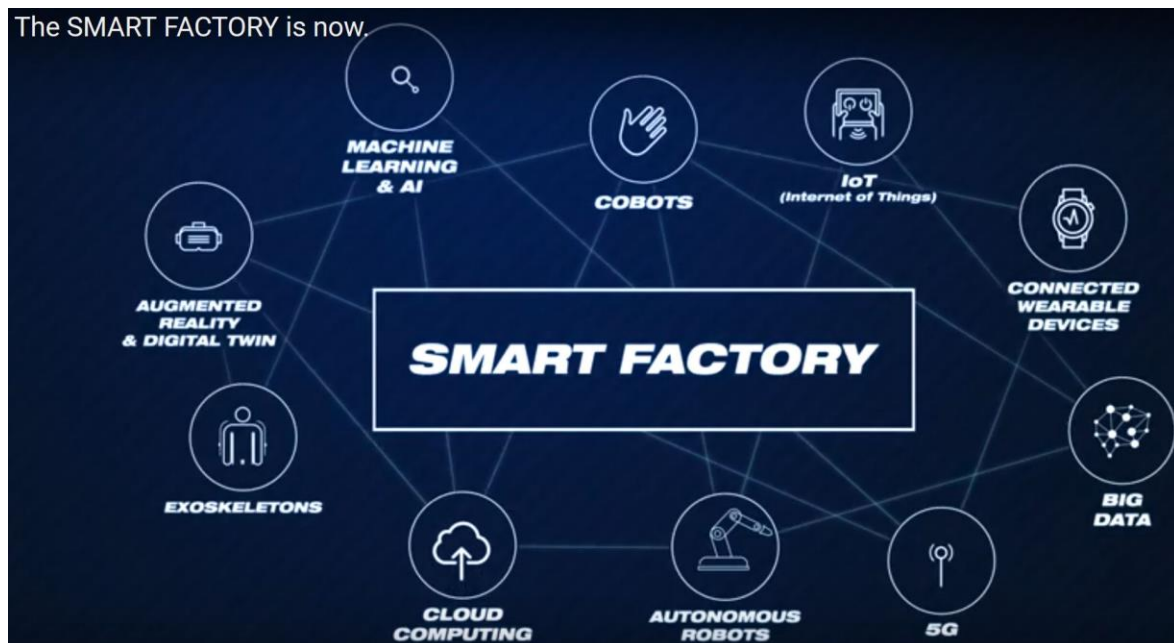


WASTE MANAGEMENT



4) Smart Factories:

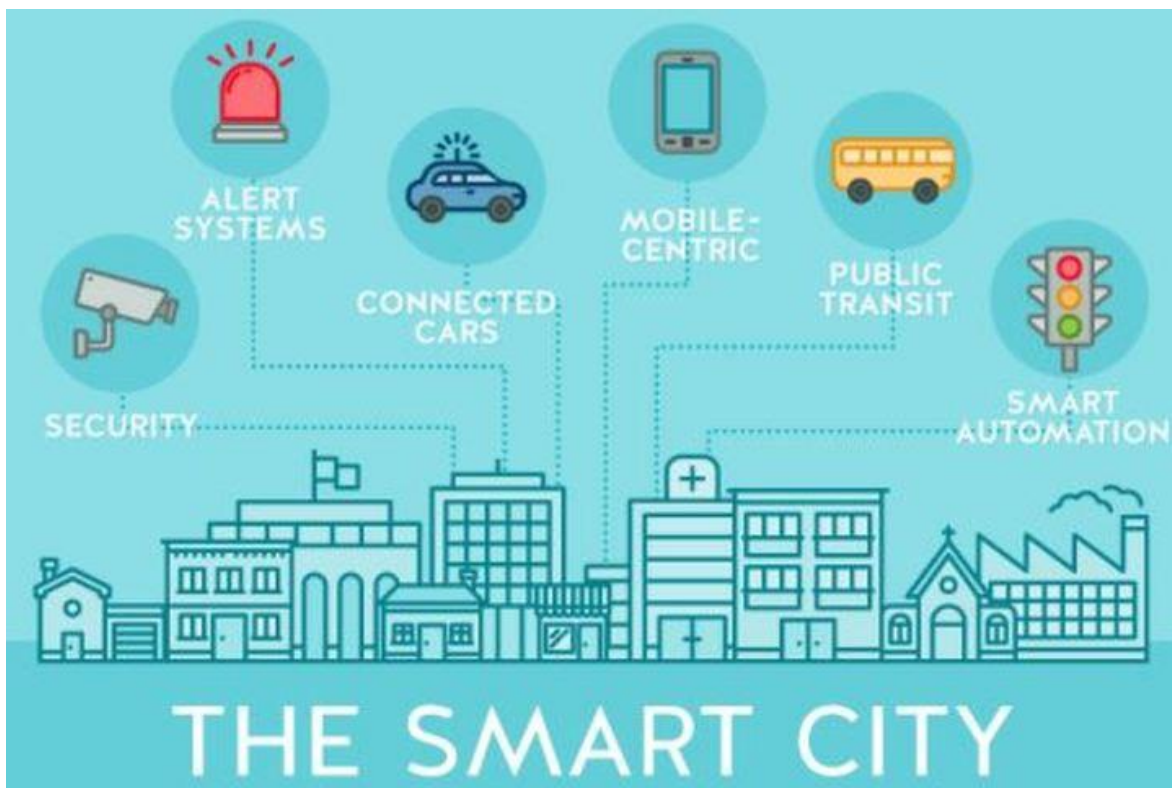
IoT-powered asset management increases real-time visibility of assets and helps businesses optimize their resource while providing benefits such as:



5)Smart parking:

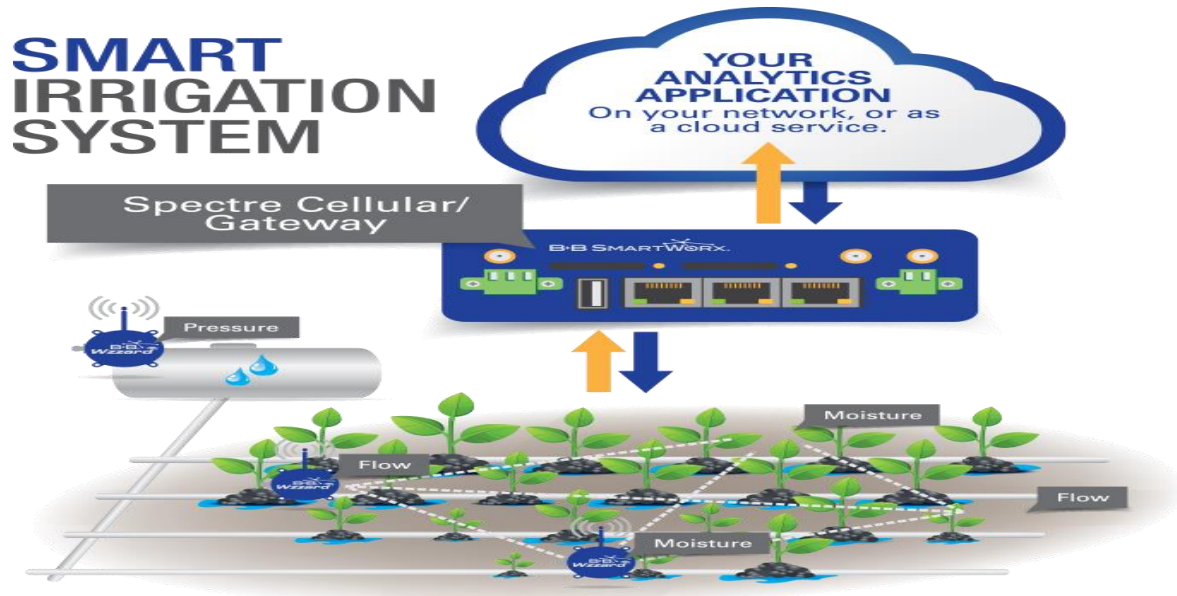
Working principle of smart parking is:

- Sensors are attached to parking lots to detect parked cars.
- Measurements are periodically sent to the cloud by microcontrollers.
- Mobile Apps use cloud data to identify empty parking spaces.
- Drivers check mobile apps to identify vacant parking spaces close to the location they aim to go to.



6)Smart Irrigation:

IoT sensors determine the weather condition and the soil moisture, which will help in getting the appropriate amount of water that soil needs. Bosch offers an IoT solution that measures how much water the tree needs and provides that amount of water.



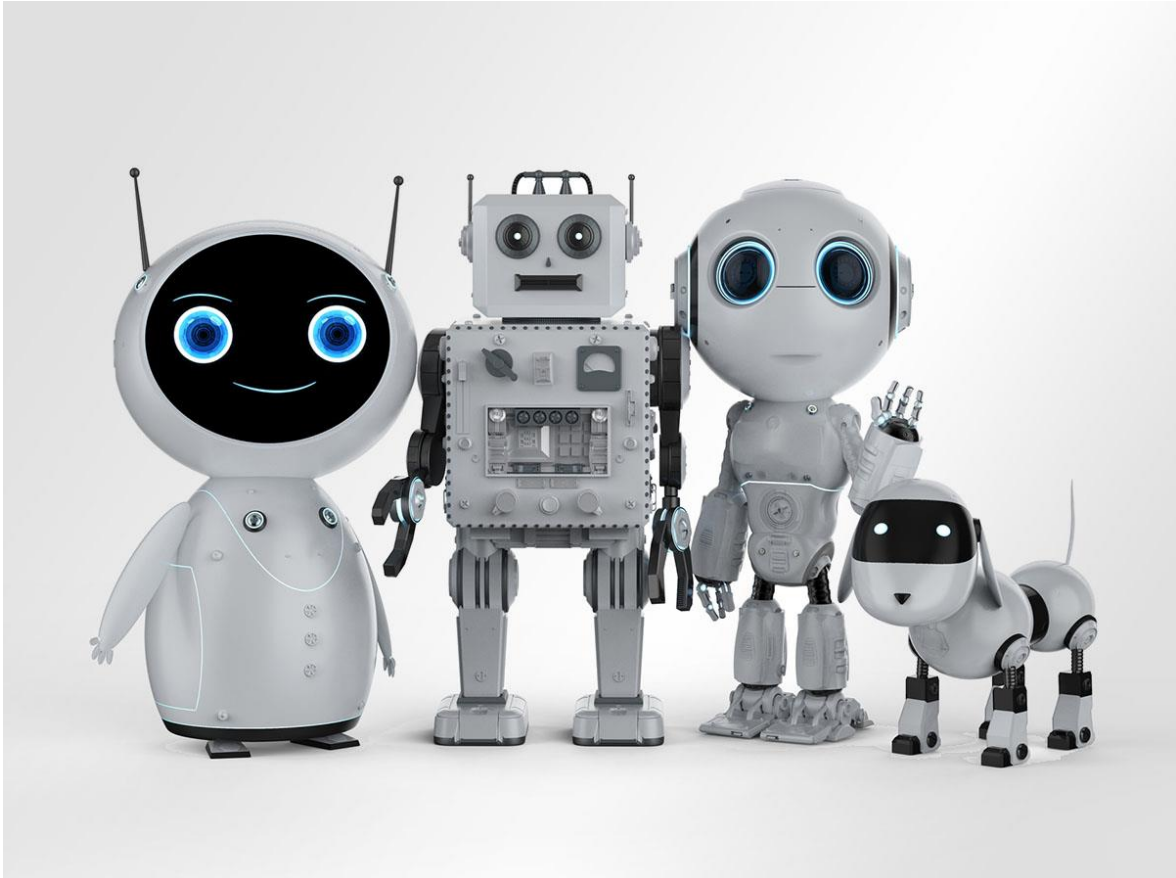
7) Fall Detection:

Falling into the ground and not being able to get up or request help can be a scary experience for senior citizens. IoT sensors can detect falls using geolocation data and summon help so that it reduces the time the elderly remain on the floor after a fall which could lead to lethal consequences.



8) Companion Robots:

IoT sensors are essential for robotics and it is the same for companion robots as well. Sensors detect objects that surround the robot and enable the robot to move.



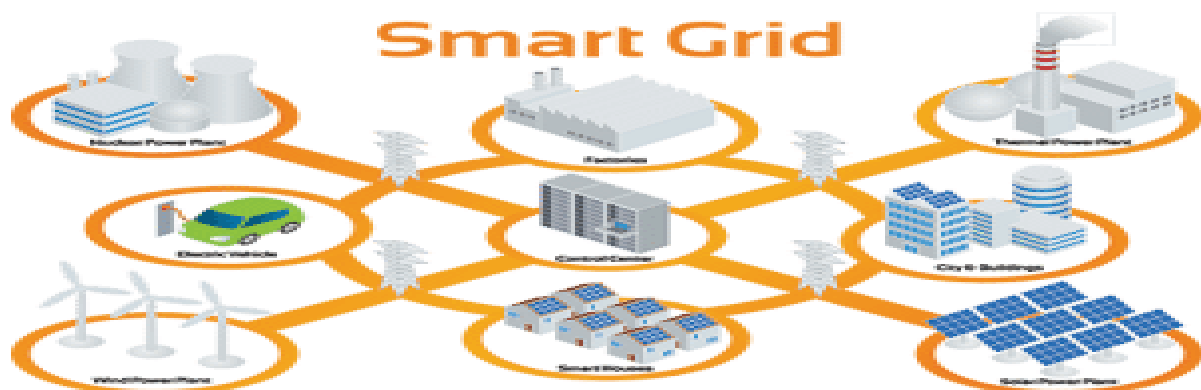
9) Fleet Tracking:

IoT fleet tracking systems improve security and provide precise and complete reports that give the fleet managers full transparency towards the fleet's activities. Through GPS monitoring and geo-location tools, companies can track the location of their trucks, optimize routes and monitor their fleet utilization in detail.



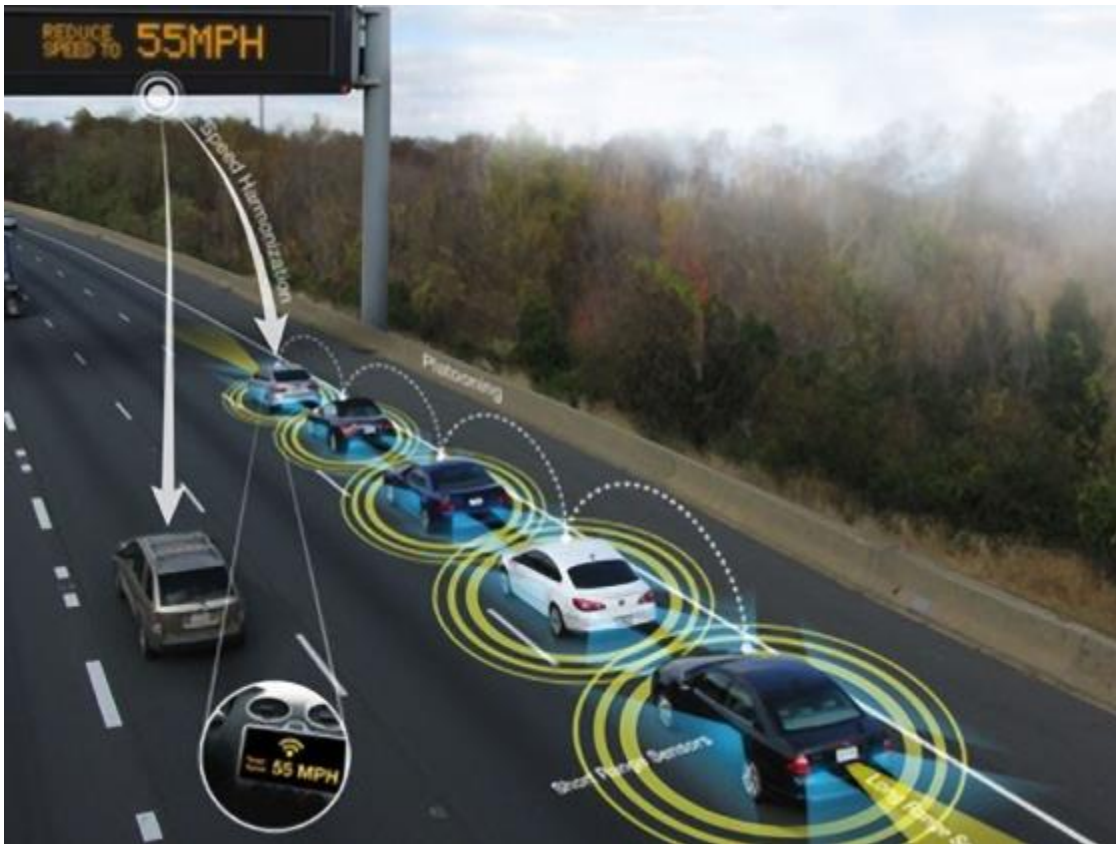
10)Smart Grid:

IoT enables remote data management and monitoring capabilities to manage better power flows into and out of their grids, and give users the insights needed to understand their energy infrastructure investments.



11)Connected Vehicles:

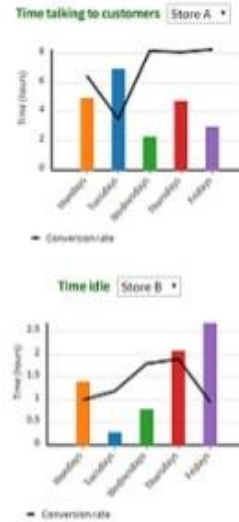
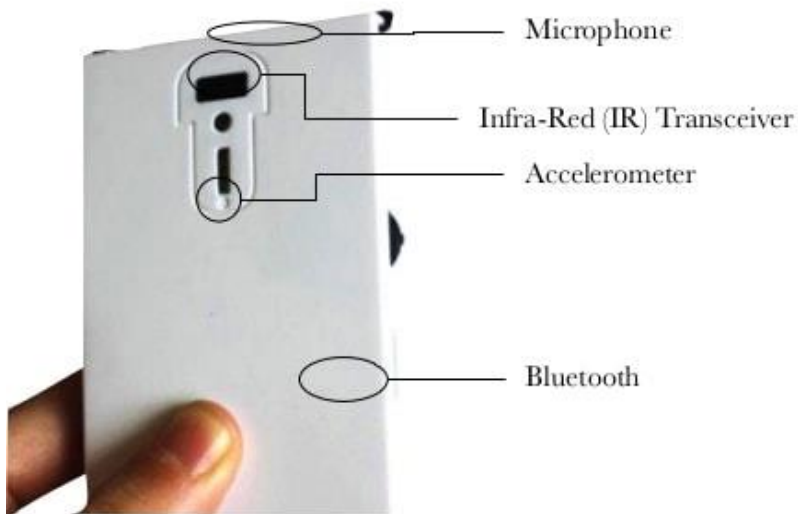
Autonomous vehicles are also an application of IoT devices. Though it is not commonly used in logistics yet, we will witness this approach soon. For instance, Mercedes-Benz prototype of the semi-autonomous truck is scheduled for release in 2025.



12)Sociometric badges:

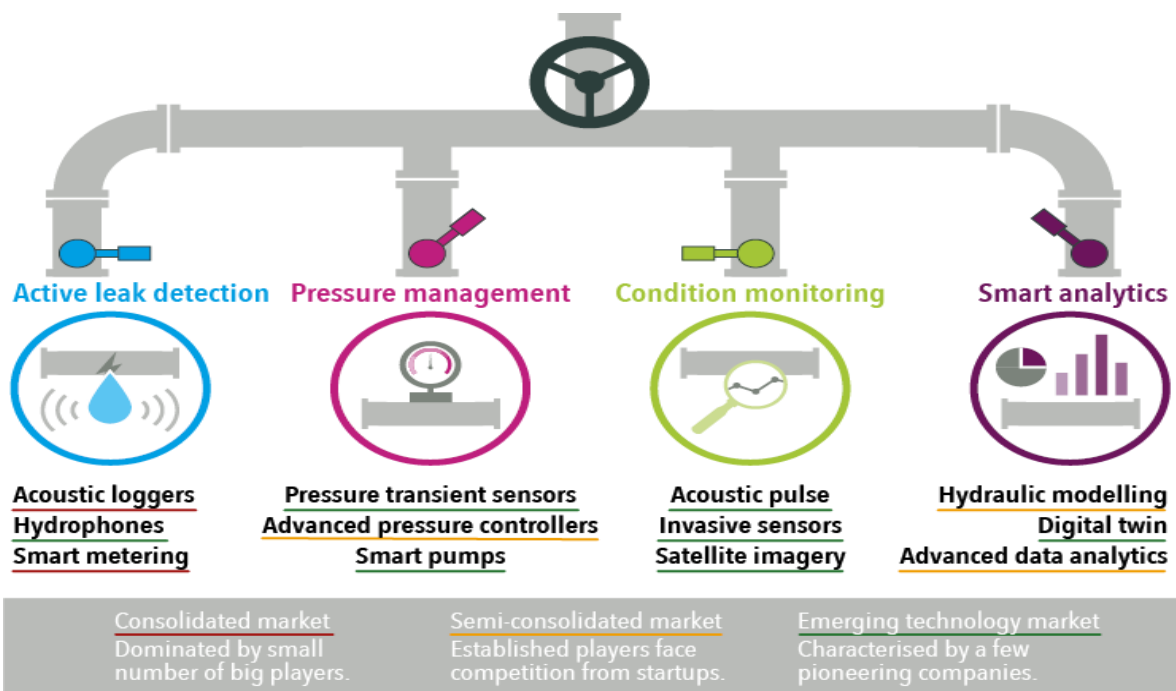
Sociometric sensors are wearable IoT devices that measure the amount of face-to-face interaction, conversational time, physical proximity to other people, and physical activity levels using social signals derived from vocal features, body motion, and relative location.

INTRODUCING THE SOCIOMETRIC BADGE



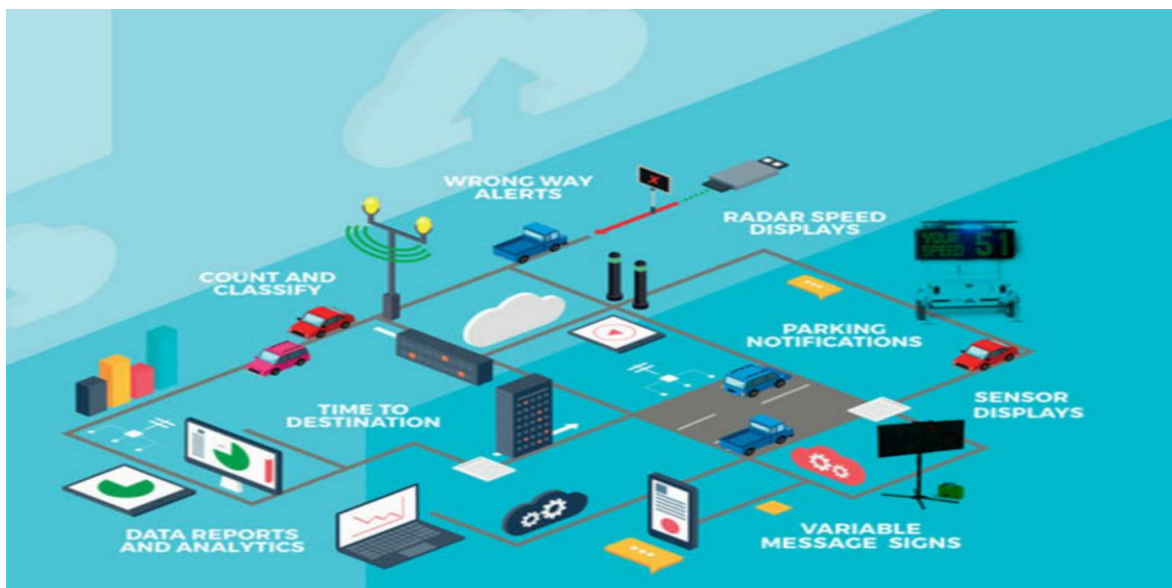
13) Leakage Management:

IoT sensors can detect temperature changes, water leakage, chemical leakage, and pressure level in water tanks.



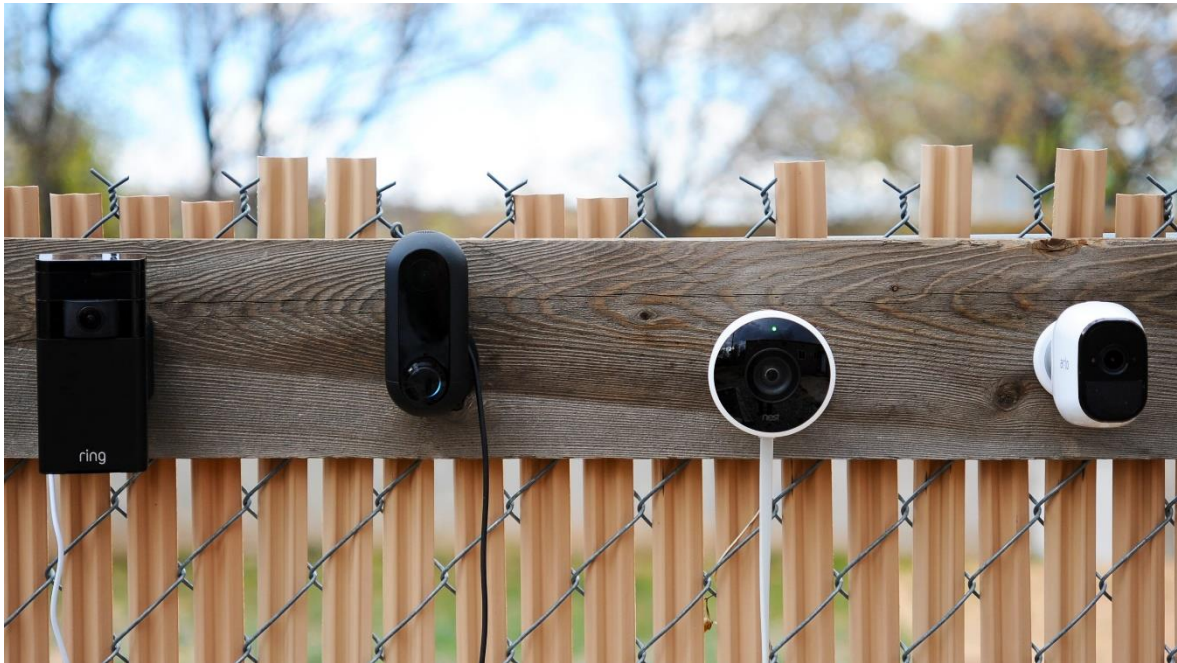
14)Electronic Road Toll Collection and Traffic Management:

Traffic engineers augmented by smart systems at a central traffic management center (TMC) can analyze data from IoT sensors then optimize timing of traffic lights throughout the day. This can help divide the traffic more evenly over roads as traffic volume fluctuates.



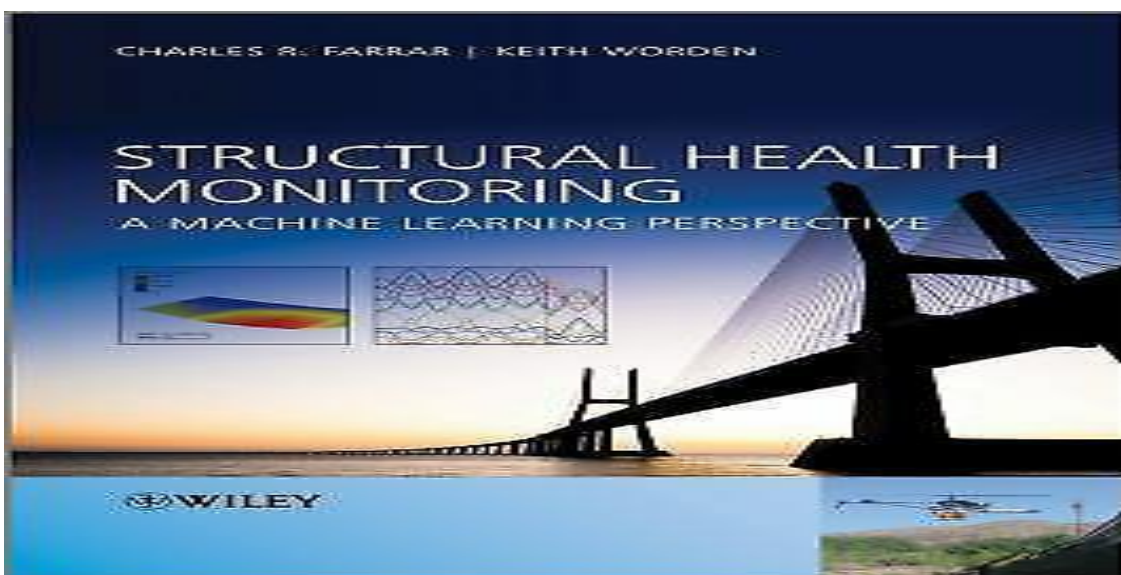
15)Outdoor surveillance:

When IoT CCTV cameras combined with artificial intelligence and machine vision, governments can automate surveillance of streets through cameras. As IoT enables connectivity of machines, they are able to record and analyse video data in real time, and they can provide police officers with insights instead of single pieces of images.



16) Structural Health Monitoring:

IoT allows remote collection of architectural data to monitor events such as vibrations and changes in material conditions, predict structural damage, and prepare action plans for structures such as bridges, buildings, stadiums, ships, airplanes, etc.



17)Digital Twins:

A digital twin is a virtual replica of physical entities such as devices, people, processes, or systems that help businesses make model-driven decisions. With the help of IoT sensors, businesses collect data that is needed to create a digital twin.



18)Motion detection:

Manything is another vendor in IoT based home security market. It streams homes/office videos and lets users receive alerts when it detects any activity.



19)Remote Control Appliances:

IoT powered home appliances let residents remotely switch on and off devices using smartphone apps to avoid incidents and save energy. Additionally, these devices can make autonomous decisions based on sensor inputs such as preparing fresh coffee when a resident is identified to wake up.



20)Medical Fridges:

Efento is an IoT sensor and IoT platform vendor that has a variety of temperature measurement products along with wireless monitoring of temperature in medical refrigerators.

