

Introduction to IoT

What is the Internet of things?

- This is the concept of connecting any device to the Internet (and/or to each other). This includes everything from cell phones, coffee makers, washing machines, headphones, lamps, wearable devices and almost anything else.
- [Gartner](#) analysts commented that by 2020 there will be over 26 billion connected devices...that's a lot of connections (some even estimate this number to be much higher, over 100 billion).
- The IoT is a giant network of connected “things” (which also includes people). The relationship will be between people-people, people-things, and things-things.

Smart World

Air Pollution

Control of CO₂ emissions of factories, pollution emitted by cars and toxic gases generated in farms.

Forest Fire Detection

Monitoring of combustion gases and prescriptive fire conditions to define alert zones.

Wine Quality Enhancing

Monitoring soil moisture and trunk diameter in vineyards to control the amount of sugar in grapes and grapevine health.

Offspring Care

Control of growing conditions of the offspring in animal farms to ensure its survival and health.

Sportsmen Care

Vital signs monitoring in high performance centers and fields.

Structural Health

Monitoring of vibrations and material conditions in buildings, bridges and historical monuments.

Quality of Shipment Conditions

Monitoring of vibrations, strokes, container openings or cold chain maintenance for insurance purposes.

Smartphones Detection

Detect iPhone and Android devices and in general any device which works with Wifi or Bluetooth interfaces.

Perimeter Access Control

Access control to restricted areas and detection of people in non-authorized areas.

Radiation Levels

Distributed measurement of radiation levels in nuclear power stations surroundings to generate leakage alerts.

Electromagnetic Levels

Measurement of the energy radiated by cell stations and WiFi routers.

Traffic Congestion

Monitoring of vehicles and pedestrian affluence to optimize driving and walking routes.

Smart Roads

Warning messages and diversions according to climate conditions and unexpected events like accidents or traffic jams.

Smart Lighting

Intelligent and weather adaptive lighting in street lights.

Intelligent Shopping

Getting advices in the point of sale according to customer habits, preferences, presence of allergic components for them or expiring dates.

Noise Urban Maps

Sound monitoring in bar areas and centric zones in real time.

Water Leakages

Detection of liquid presence outside tanks and pressure variations along pipes.

Vehicle Auto-diagnosis

Information collection from CanBus to send real time alarms to emergencies or provide advice to drivers.

Item Location

Search of individual items in big surfaces like warehouses or harbours.

Waste Management

Detection of rubbish levels in containers to optimize the trash collection routes.

Smart Parking

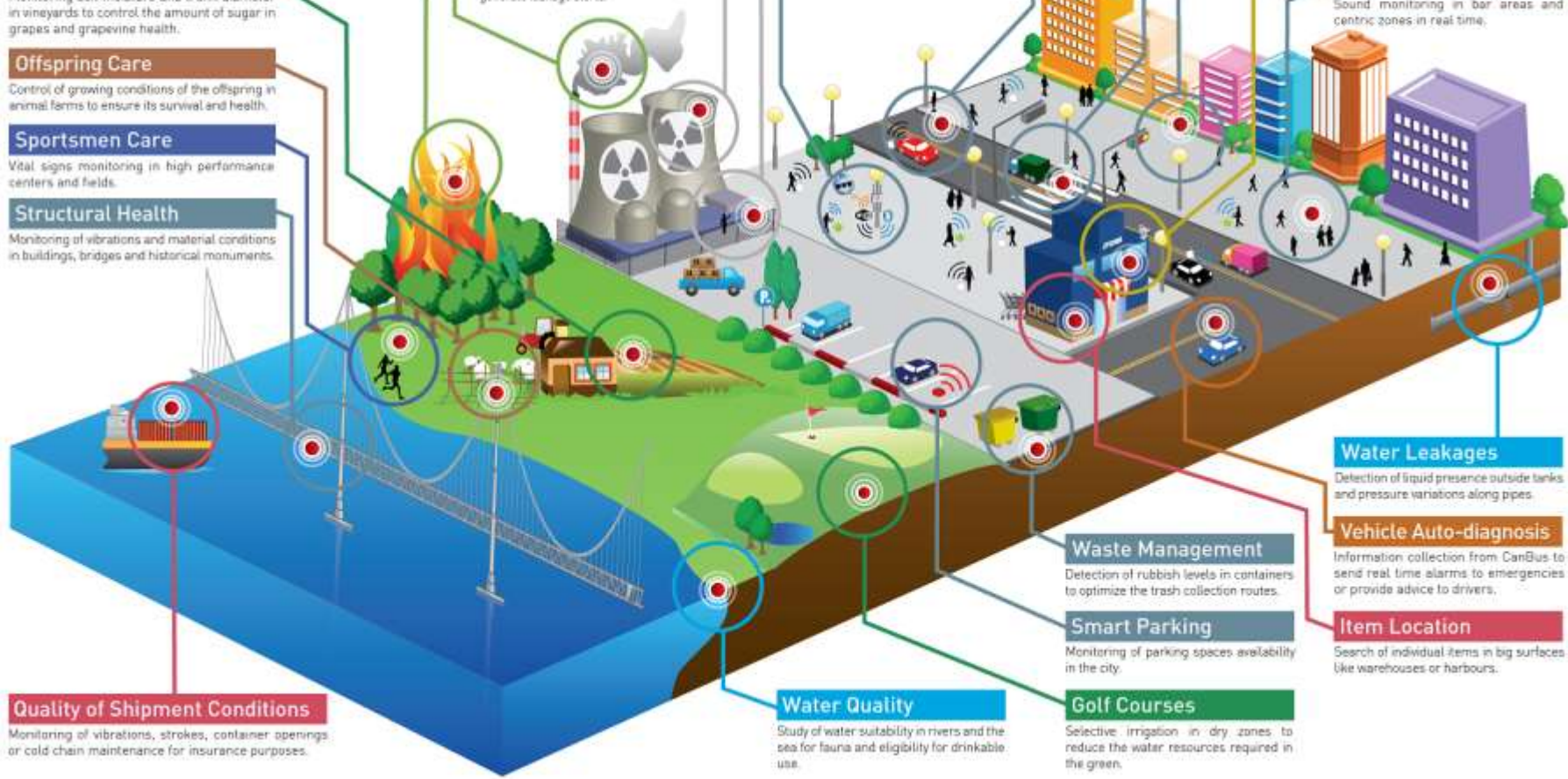
Monitoring of parking spaces availability in the city.

Golf Courses

Selective irrigation in dry zones to reduce the water resources required in the green.

Water Quality

Study of water suitability in rivers and the sea for fauna and eligibility for drinkable use.



The IoT Building Blocks

- Sensors & controllers – these are the endpoint devices which are connected to the internet, providing ability to sense or act in the physical world
- Cloud infrastructure – connecting IoT Sensors & Controls to the internet over WiFi or Mash remote connection and leveraging specific IoT application level communication protocols
- Software Applications – network applications, over web or over local network, enabling control over IoT-enabled devices