

The Internet of Things

A Cautionary Tale

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Agenda

- ▶ What it is
- ▶ What it is not
- ▶ Why do you care
- ▶ What should you do about it

“Just because you're paranoid doesn't mean they aren't after you.”
— Joseph Heller, *Catch-22*



WHAT IT IS

- ▶ The **Internet of Things (IoT)** is a scenario in which objects, animals or people are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.
 - Scenario
 - External and Internal connections
 - Components to accomplish the objectives are around today



WHAT IT IS

- ▶ Connectedness on Steroids
- ▶ Data on everything coupled with analytics to identify relationships and to “predict” future behavior
 - Monitor your whereabouts
 - Monitor your whereyouhavebeens
- ▶ Dependent on connection and data storage and analytics



WHAT IT IS

Libelium 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 preemptive 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

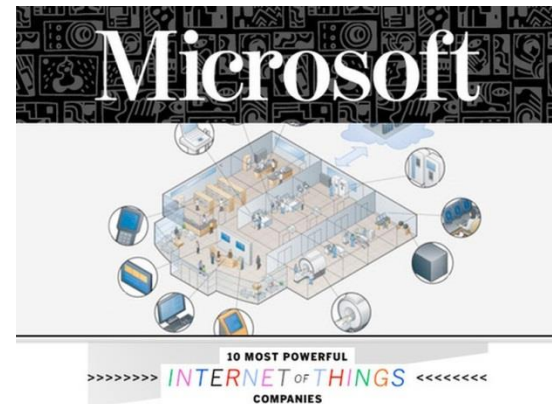
Selective irrigation in dry zones to reduce the water resources required in the green.

Water Quality

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

WHAT IT IS NOT (YET)

- ▶ Completely here
 - Lack of fully connected infrastructures
 - Lack of funding for data storage
 - Lack of data analytics (too much data not enough time)
- ▶ Regulated
 - European privacy laws will be the first regulatory test



WHAT IT IS NOT (YET)

- ▶ Secure
 - OPM Data Breaches
 - Sony Hack
 - Apple Proprietary Code
- ▶ A Threat
 - Common standards for information sharing are not adhered to
- ▶ Benign
 - Data collected/analyzed can be powerful tools or weapons



WHY DO YOU CARE?

- ▶ It's here (at least parts)
 - Amsterdam is “smart” city
 - Your vending machine is collecting your drink/candy preferences
 - Your home security system is remotely monitored and now controllable on your smart phone
 - Yahoo is collecting your internet purchases
 - Your refrigerator can scan for items and use by dates and alert you for spoilage
- ▶ You are agreeing to privacy/release of your data all the time
 - Medical Provider
 - Employer
 - Cell Service
 - Internet provider
 - Social Media Site
 - Apartment complex?



WHAT SHOULD YOU DO ABOUT IT?

- ▶ Look at IoT as an opportunity
 - Exponential infrastructure requirements
 - There's now an app for everything
 - Business ventures are starting all the time
- ▶ Look at IoT with a healthy skepticism
 - Be careful how connected you are
 - Be careful what you release and to whom
- ▶ Open your eyes
 - Boundaries of government are being blurred
 - Just because something can be done doesn't mean it needs to be done



WHAT SHOULD YOU DO ABOUT IT? - TIPS

- ▶ Start Small – don't sign up for every new thing when it becomes available, you will never be able to track them all, let alone secure them.
 - ▶ Keep it Simple – automated notification of the need for milk is harmless, automating insulin doses is not.
 - ▶ Rely on Nothing – especially when your physical well-being is concerned. Always, ALWAYS have a back-up if your primary mechanism fails.
 - ▶ Minimize the Impact – expose only what you don't mind losing. Insure everything, especially your finances.
 - ▶ Take Responsibility – blame yourself if things go wrong, don't waste your time pointing fingers at others. This was YOUR choice, live with it.
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