Internet Of Thing is not ...
Internet of Things is not... The Internet of the robot (image Star Wars R2D2 connected to a terminal) the transformation of the human to become a Things (image Daft punk) WHERE'S WALL-E?
Internet of Things is not...

The Internet of Things (image: Star Wars R2D2 connected to a terminal)

The transformation of the human to become a Thing (image: Daft Punk)
History of Internet

Started in California in 197x (image google earth with the firsts university)

The Web revolution in 1989 (image Berners)
History of Internet

Started in California in 197x (image google earth with the first university)

The Web revolution in 1989 (image Berners)
History of Internet

Started in California in 197x (image google earth with the firsts university)

The Web revolution in 1989 (image Berners)
History of Internet

Tim Berners Lee bring us the World Wide Web in 1989
History of Internet

- 1989:
  - 0 billions

- 2000:
  - 3 billions
  - Internet user: 0.1 billion
  - World population: 2.9 billion

- 2012:
  - 7 billions
  - Internet user: 3.4 billion
  - World population: 3.6 billion

- 10 billions

Legend:
- Green: Internet user
- Grey: World population
The IOT Revolution

Idea: Start a new revolution in communication domain for the machine
During 2008, the number of things connected to the Internet exceeded the number of people on earth.

By 2020 there will be 50 billion.

These things are not just smartphones and tablets.
The Things of IOT

Computers, Smart phones, tablets, tux droids, cars, shoes, alarm clock, house, bin tray, solar tracker ;-) and even cow.
The Things of IOT

Computers, Smart phones, tablets, tux droids, cars, shoes, alarm clock, house, bin tray, solar tracker ;-) and even cow.
The IOT applications
Smart Energy

Smart cities: FRED and “Our planetary skin”

Smart agriculture: Cow (from Cisco)

Trailer video from IOT-A with the alarm clock
Smart Environment

Smart cities:
Smart science: FRED and “Our planetary skin”
Smart agriculture: Cow (from Cisco)

Trailer video from IOT-A with the alarm

Planetary skin
Smart City

Smart Urban Planning

Interactive Street Sensing gathers data about the city—the city's pulse. Sensors on every lamppost in the city measure data about noise, traffic, environment, crowds, temperature—literally anything. Data is transmitted and processed and information is presented as...

— dynamic infographics, showing interesting detail about the city as a living organism, e.g. how it is used by people, flow of traffic and impact on the environment...

—for example, a map illustrating real-time and historic data of pollution can be viewed.

Smart Urban Waste Management

The implementation of smart urban waste management will allow for a more efficient waste collection and optimizing the way in which it is performed today.

Smart urban waste management will provide useful information to the public by encouraging and promoting an easier and more environmentally friendly way of collecting waste. This can be achieved by identifying and emptying bins and containers when they are close to their fill level but not overflowing at private households, enterprises, and public areas.

In addition, incentives can be brought forward to encourage citizens to produce less waste and recycle more.
Smart agriculture

These things are not just smartphones and tablets.

They’re everything.

A Dutch startup, Sparked, is using wireless sensors on cattle.

So that when one is sick or pregnant, it sends a message to the farmer. Each cow transmits 200 mb of data per year.
Control System

Internet network

Human

The Internet

Human

Human

Human
Control System

IOT network

The Internet Of Things

Human

The Internet
Control System

Control System network

Human

Scientific Facilities
Control System
Autonomous Device
Orbit Feedback example
Autonomous Device

Orbit Feedback example

Software

Machine Control System

Hardware

Control system connection
Autonomous Device

Orbit Feedback example

Software

Hardware

Machine Control System

R3/MAG/PWS.21

R3/DIAG/LIB.12

Control system connection

Identification

Machine Model

GPS

Galileo
Autonomous Device

Orbit Feedback example

Software

- SOFB
- Scan

Machine Control System

- Machine Model
  - GPS
  - Galileo

Hardware

- R3/MAG/PWS.21

Identification and Role

Control system connection

- Corrector Magnet Actuator
- FOFB BPM Sensor

Identification and Role
Autonomous Device

Orbit Feedback example

Control system connection
Identification and Role

Software
- SOFB
- Scan

Machine Control System

Hardware
- Corrector Magnet Actuator
- FOFB BPM Sensor

Identification and Role

GPS Galileo

Machine Model

R3/MAG/PWS.21
R3/MAG/QC.21
R3/DIAG/LIB.12
R3/DIAG/BPM.[46..49]
Autonomous Device

Orbit Feedback example

Software

SOFB

Scan

Machine Control System

Corrector Magnet Actuator

FOFB BPM Sensor

X/Y

Machine Model

GPS Galileo

Hardware

Control system connection

Identification and Role

Semantic

R3/MAG/PWS.21

R3/DIAG/LIB.12

R3/MAG/QC.21

R3/DIAG/BPM.[46..49]
Autonomous Device

Orbit Feedback example

Software

SOFB
Scan

Machine Control System

Correction Magnet Actuator
FOFB BPM Sensor

X/Y

Hardware

GPS Galileo

R3/MAG/PWS.21
R3/MAG/QC.21
R3/DIAG/LIB.12
R3/DIAG/BPM.[46..49]
What IOT can bring

R3/DIAG/LIB.12

Do you want to try the new Fast Orbit Feedback algorithm during the next Machine shift?
Challenges

Behaviour and semantics are part of the convergence of IOT as well as the next generation of control systems in addition to the standardisation of the communication protocol and the data representation.
Challenges

Identification
Protocol
Standardisation
Ontology
Semantic
Artificial Intelligence
Conclusion

Interconnected Control System
Credits

R2D2: http://www.flickr.com/photos/donsolo/3768623542/


Internet history: http://internethistory.eu/index.php/internet-history/

Tim Berners-Lee: http://pierreangy.deviantart.com/art/Tim-Berners-Lee-Wallpaper-337928976


Smart Phone: http://commons.wikimedia.org/wiki/File:IPhone_5.png


Car: http://www.flickr.com/photos/stretchdog/1702041748/

Alarm clock: http://www.flickr.com/photos/puckman/4008644628/

Cable car: http://commons.wikimedia.org/wiki/File:San_Francisco_Cable_Car_MC.jpg
