

MAXIV

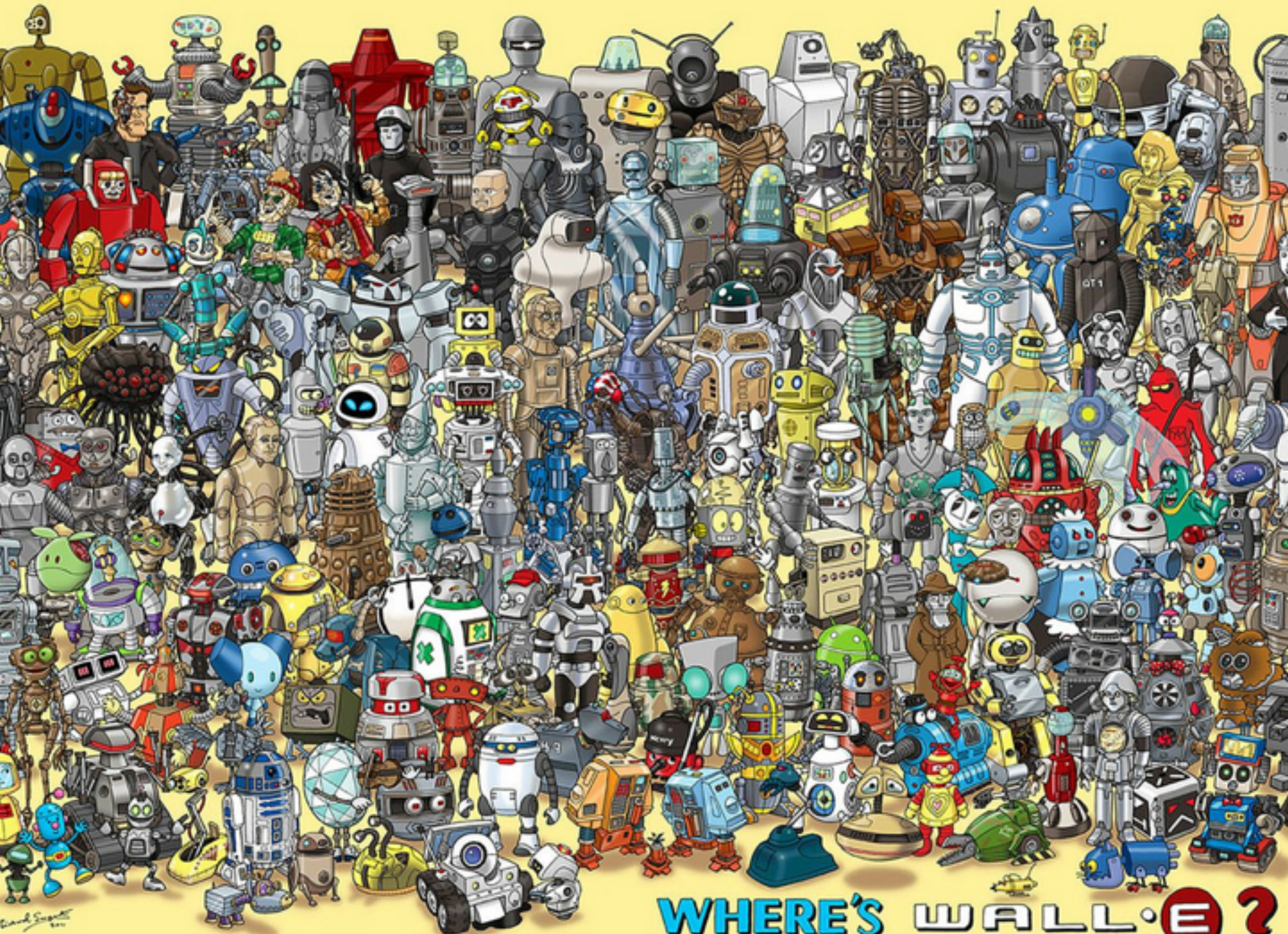
The word "MAXIV" is rendered in a bold, grey, sans-serif font. A vibrant yellow swoosh, consisting of two curved lines, starts under the 'M', loops around the 'X', and extends towards the 'V', adding a dynamic and modern feel to the logo.



The Internet Of Things and The Control System

Vincent Hardion, 2013/10/08

Internet Of Thing is not ...



WHERE'S WALL·E?



History of Internet

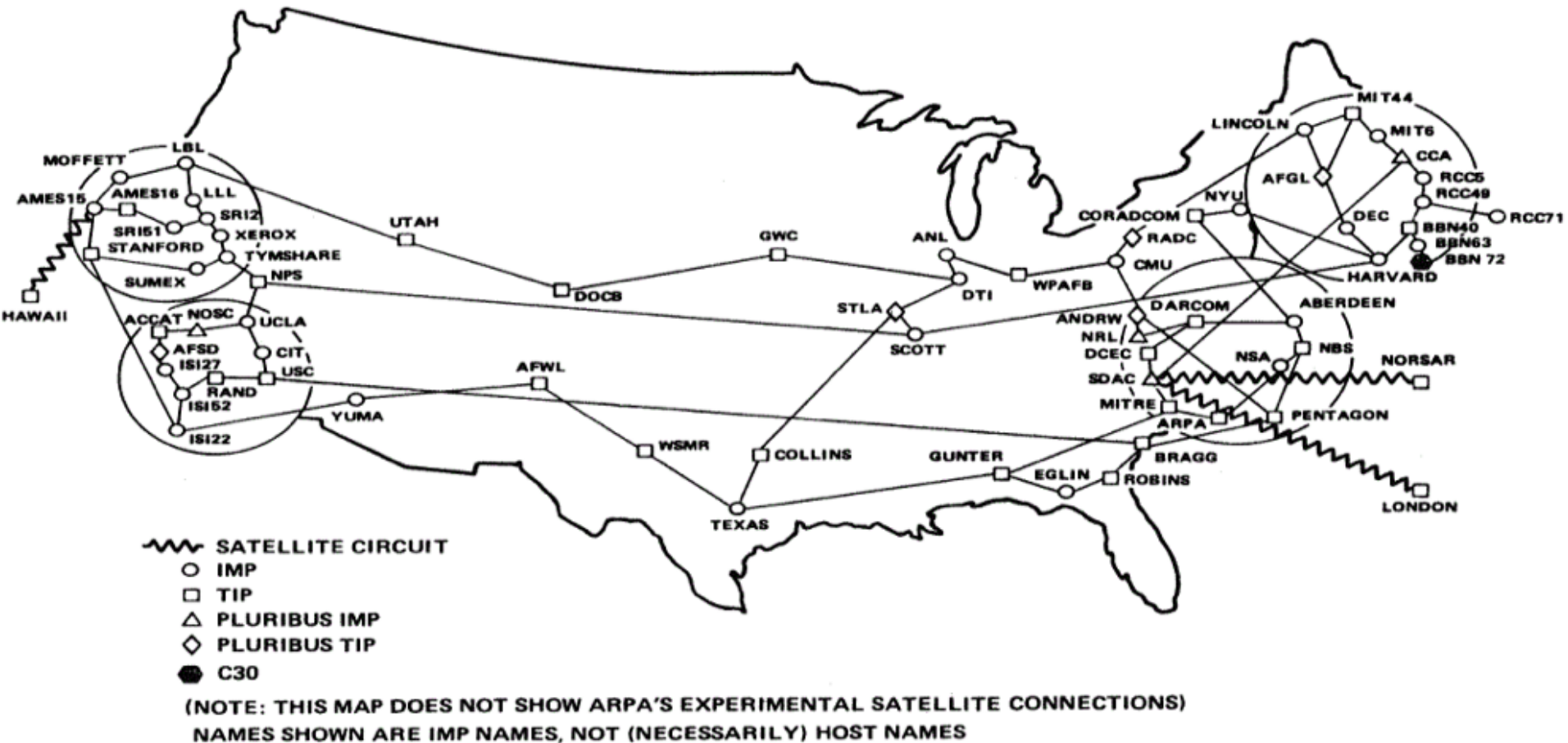


History of Internet



History of Internet

ARPANET GEOGRAPHIC MAP, OCTOBER 1980

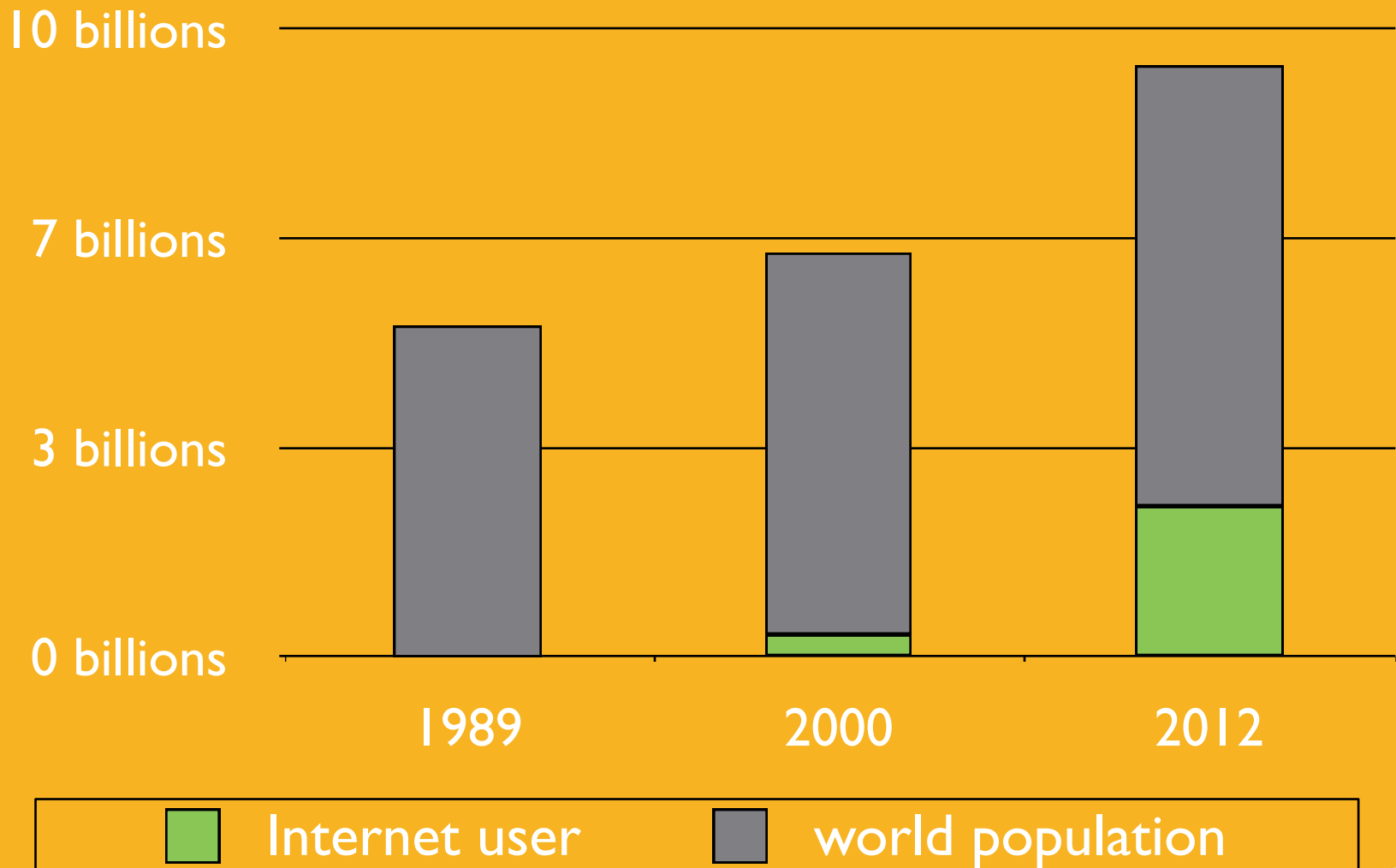


History of Internet

Tim Berners Lee
bring us the World Wide Web in 1989



History of Internet



The IOT Revolution

**Idea: Start a new revolution in
communication domain for the machine**

The IOT Revolution

During 2008, the number of **things** connected to the Internet exceeded the number of **people** on earth.



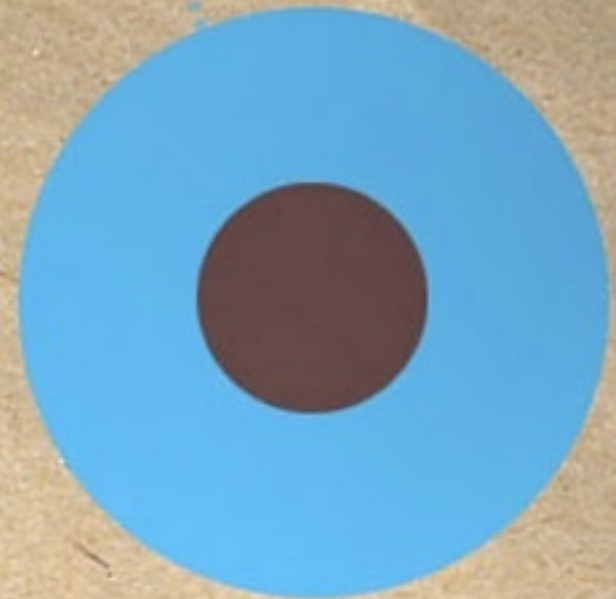
2003



2010



2015



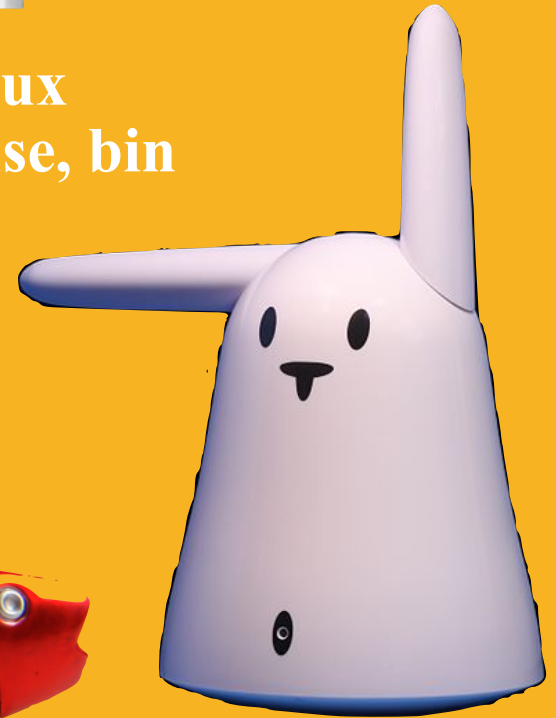
By **2020** there will be **50 billion**.

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.





POWELL
AND
MARKET

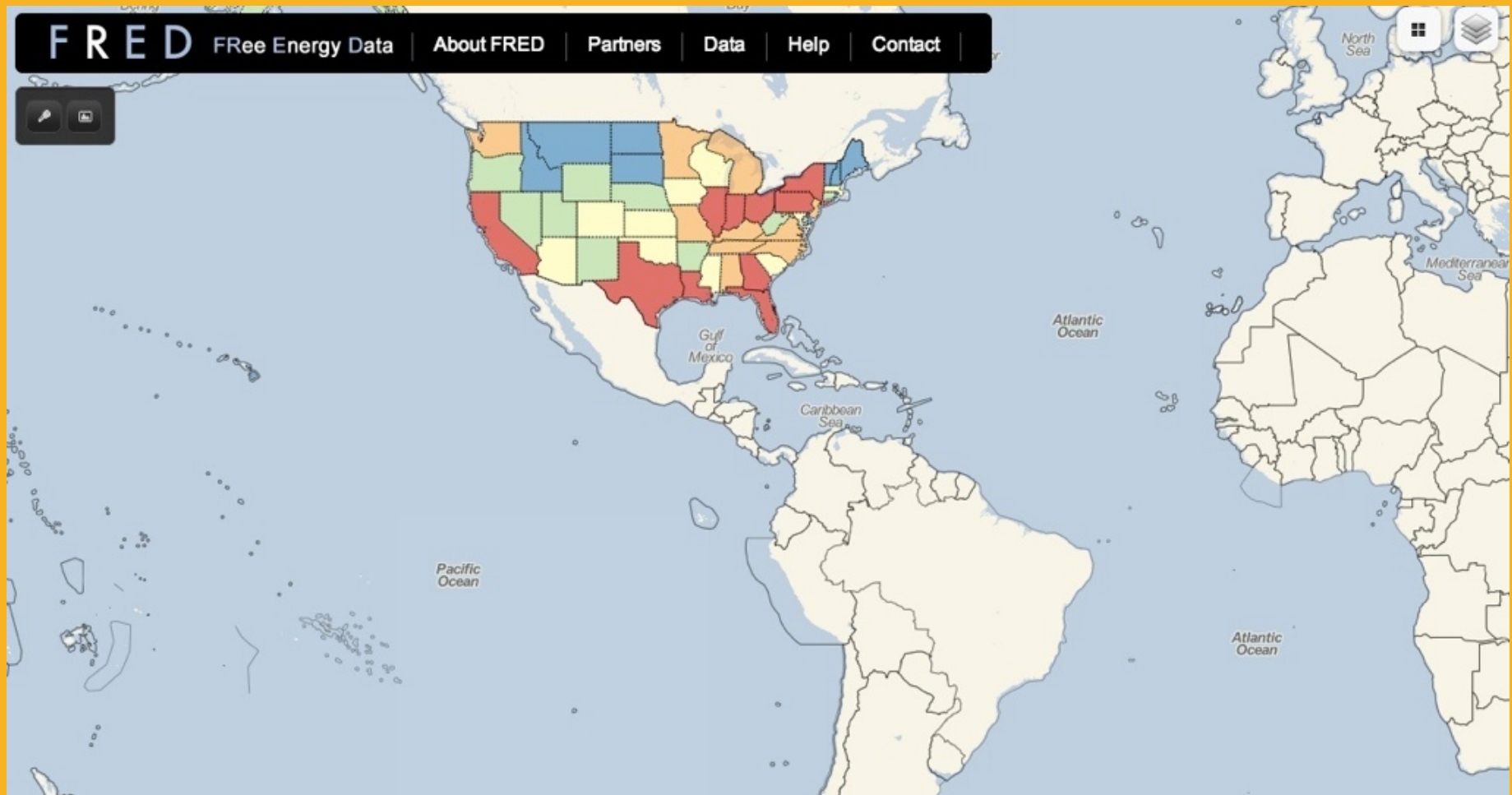
HYDE BEACH
FISHERMANS
WHARF

24

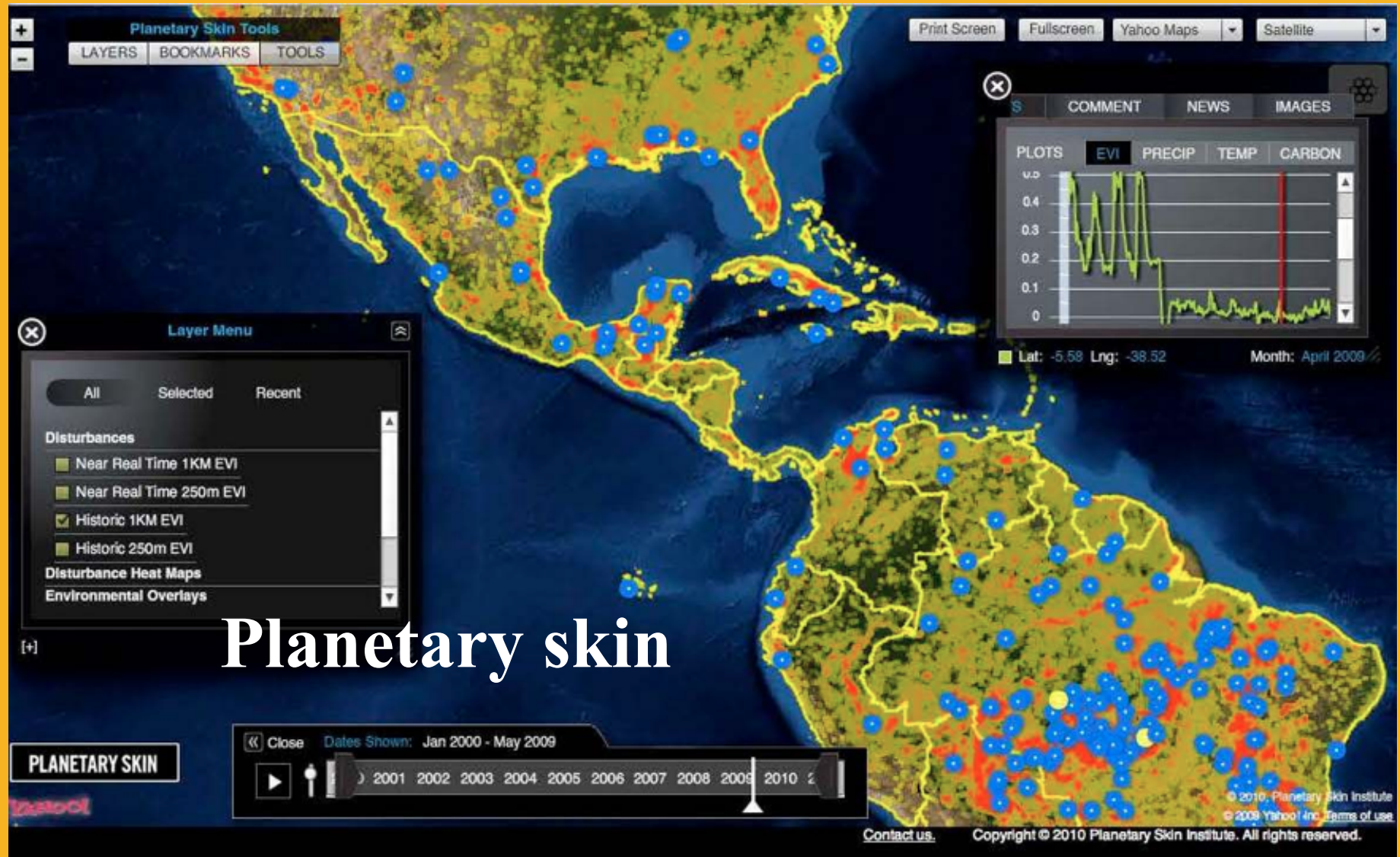


The IOT applications

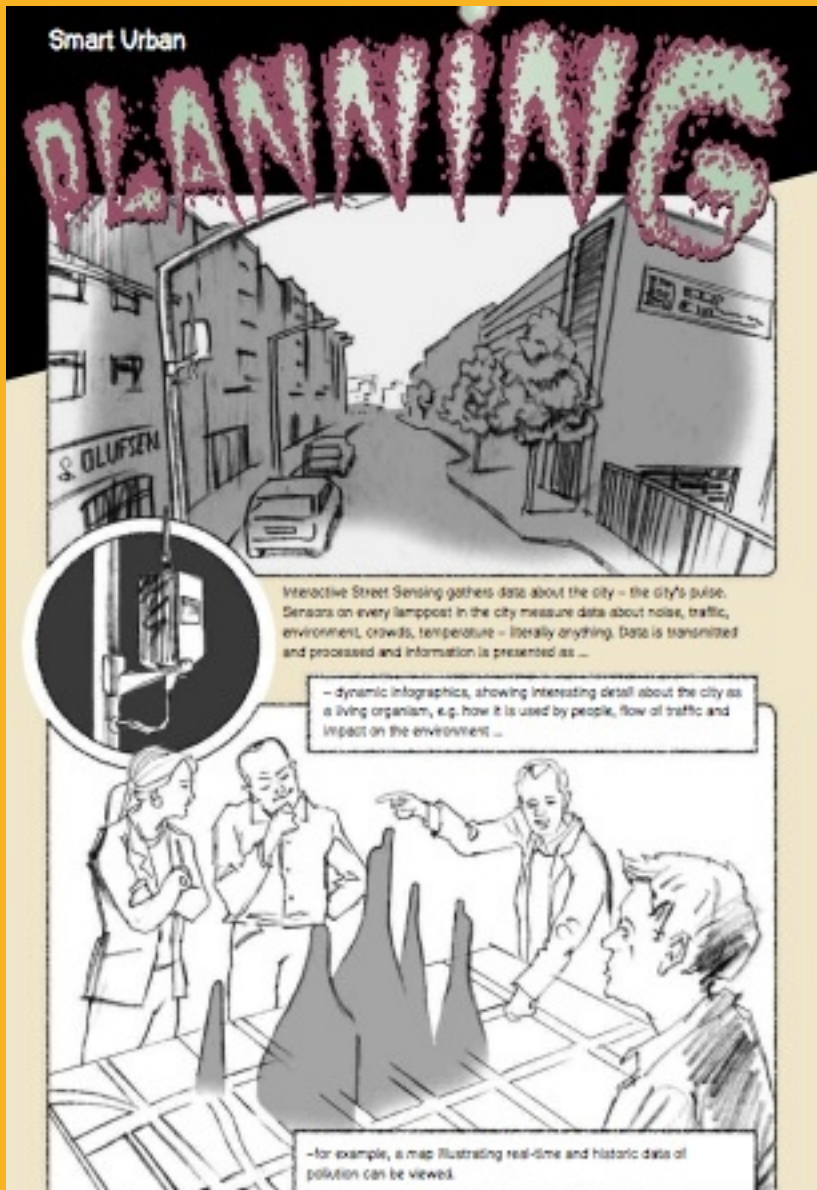
Smart Energy



Smart Environment



Smart City

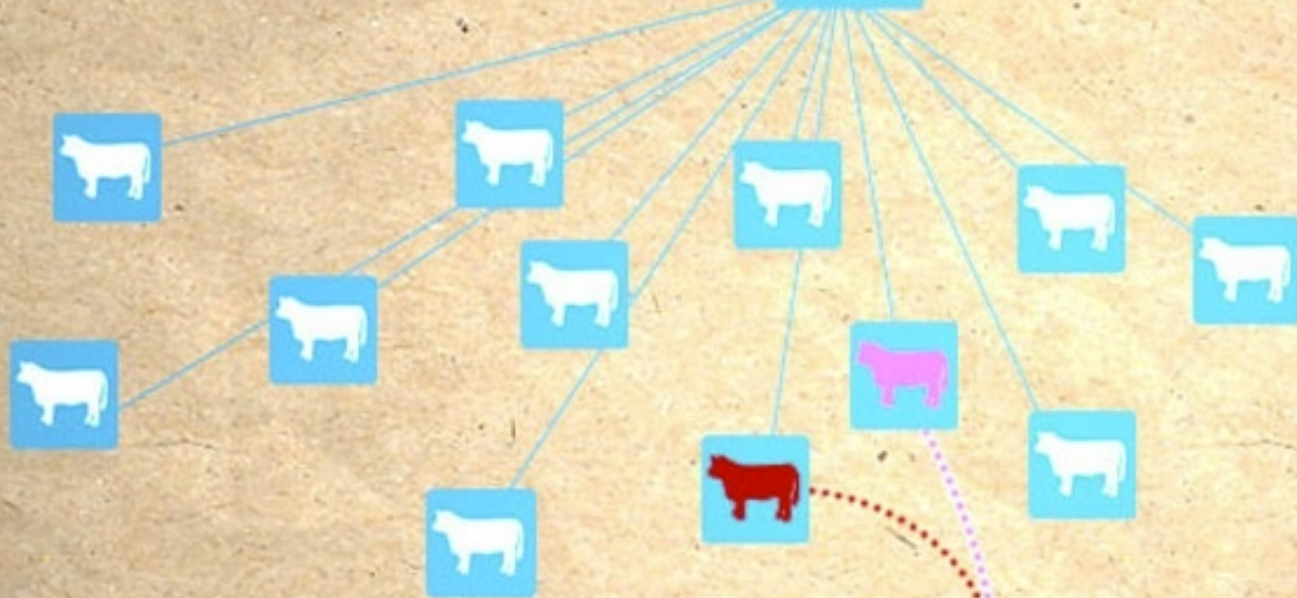


Smart agriculture

These **things** are not just smartphones and tablets.

They're every **thing**.

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



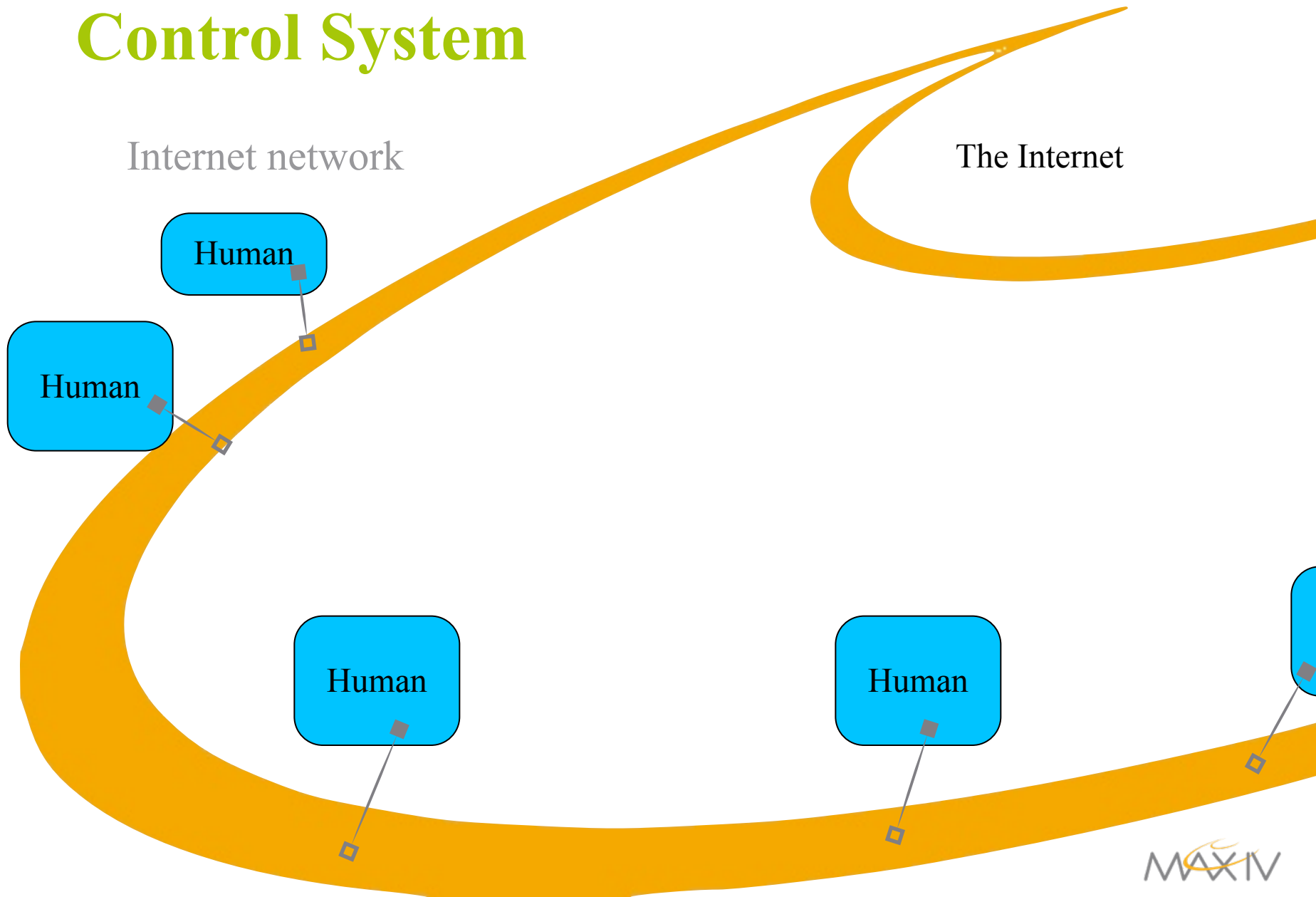
So that when one is sick or pregnant, it sends a message to the farmer. Each **cow** transmits 200 mb of data per year.



Control System

Internet network

The Internet



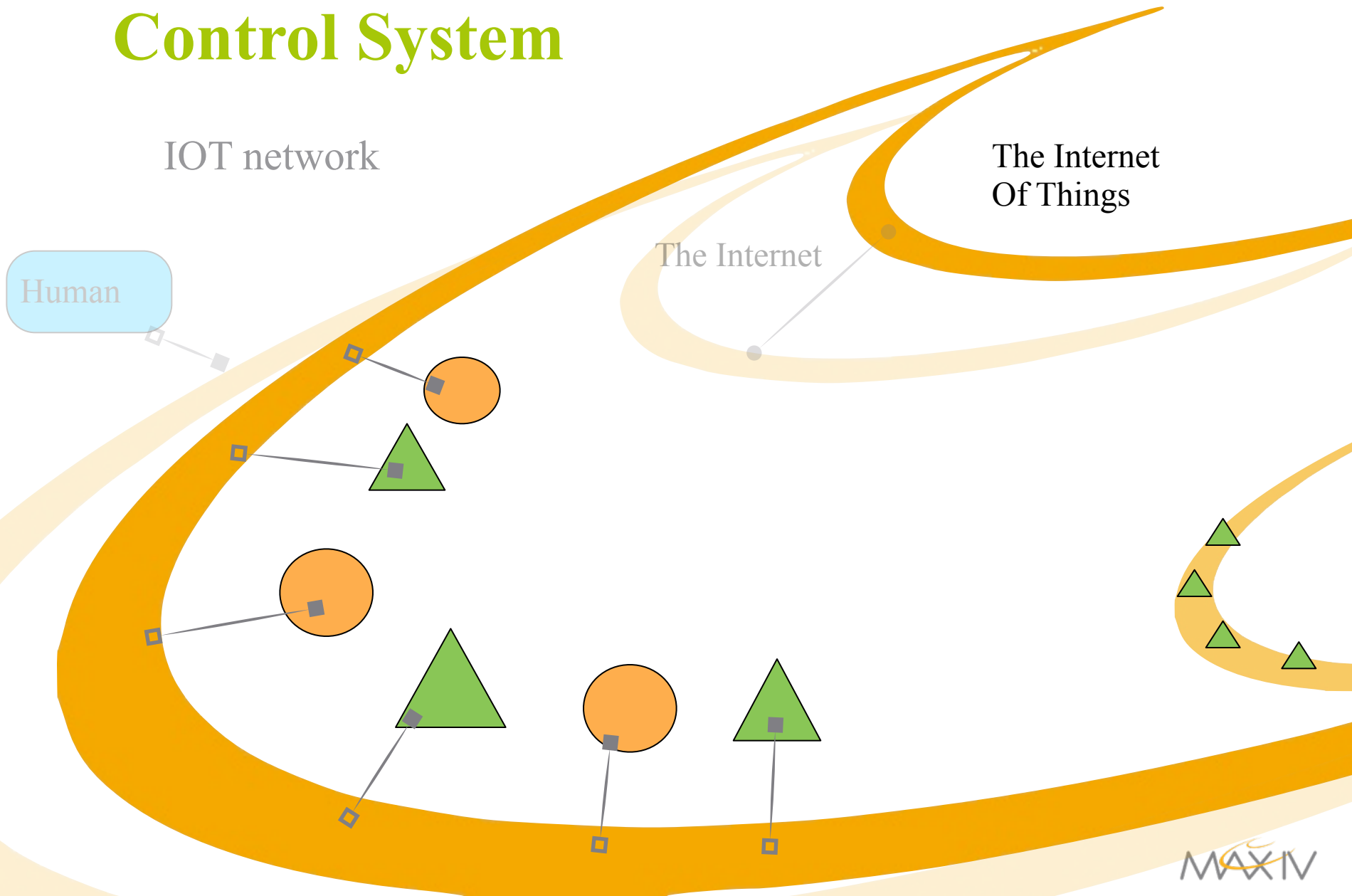
Control System

IOT network

The Internet
Of Things

The Internet

Human

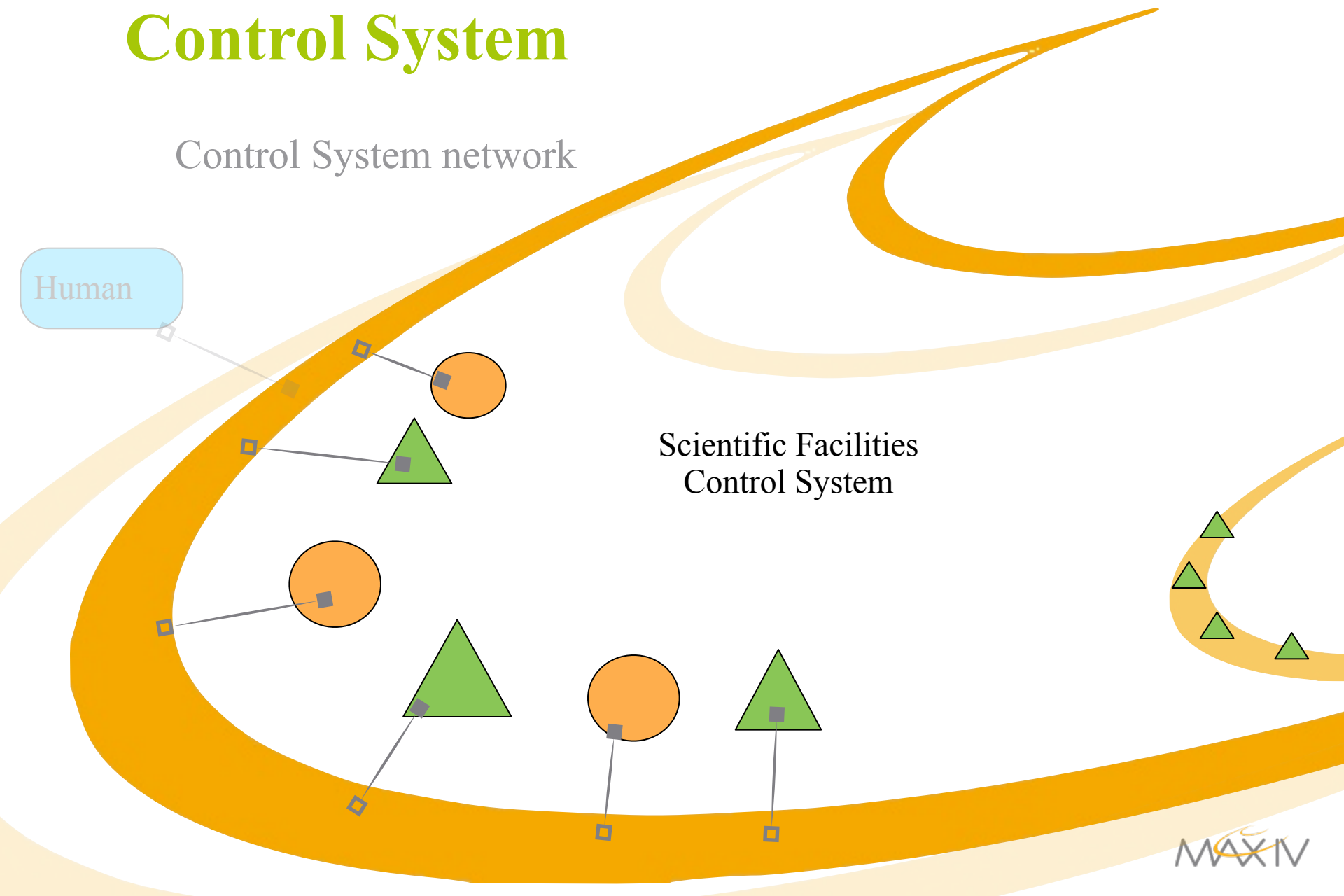


Control System

Control System network

Human

Scientific Facilities
Control System

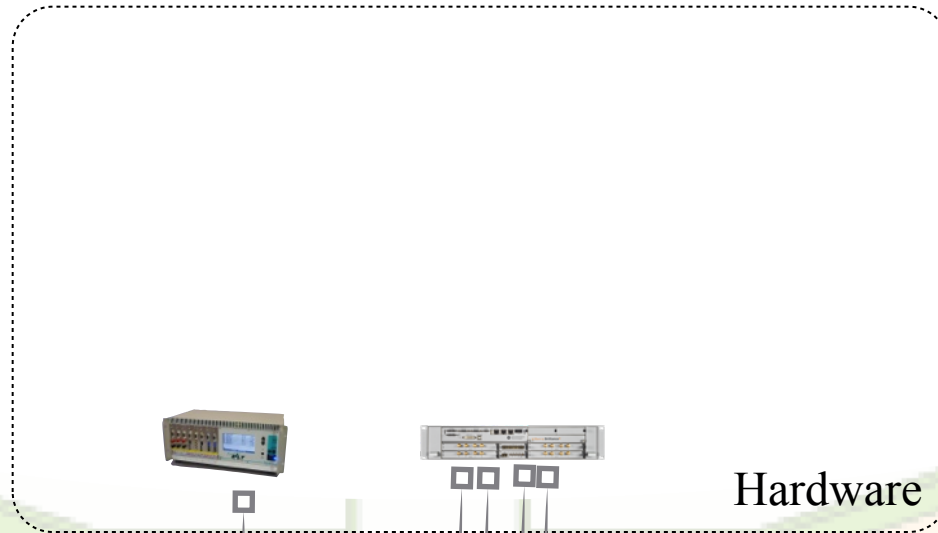


Autonomous Device

Orbit Feedback example

Machine
Control System

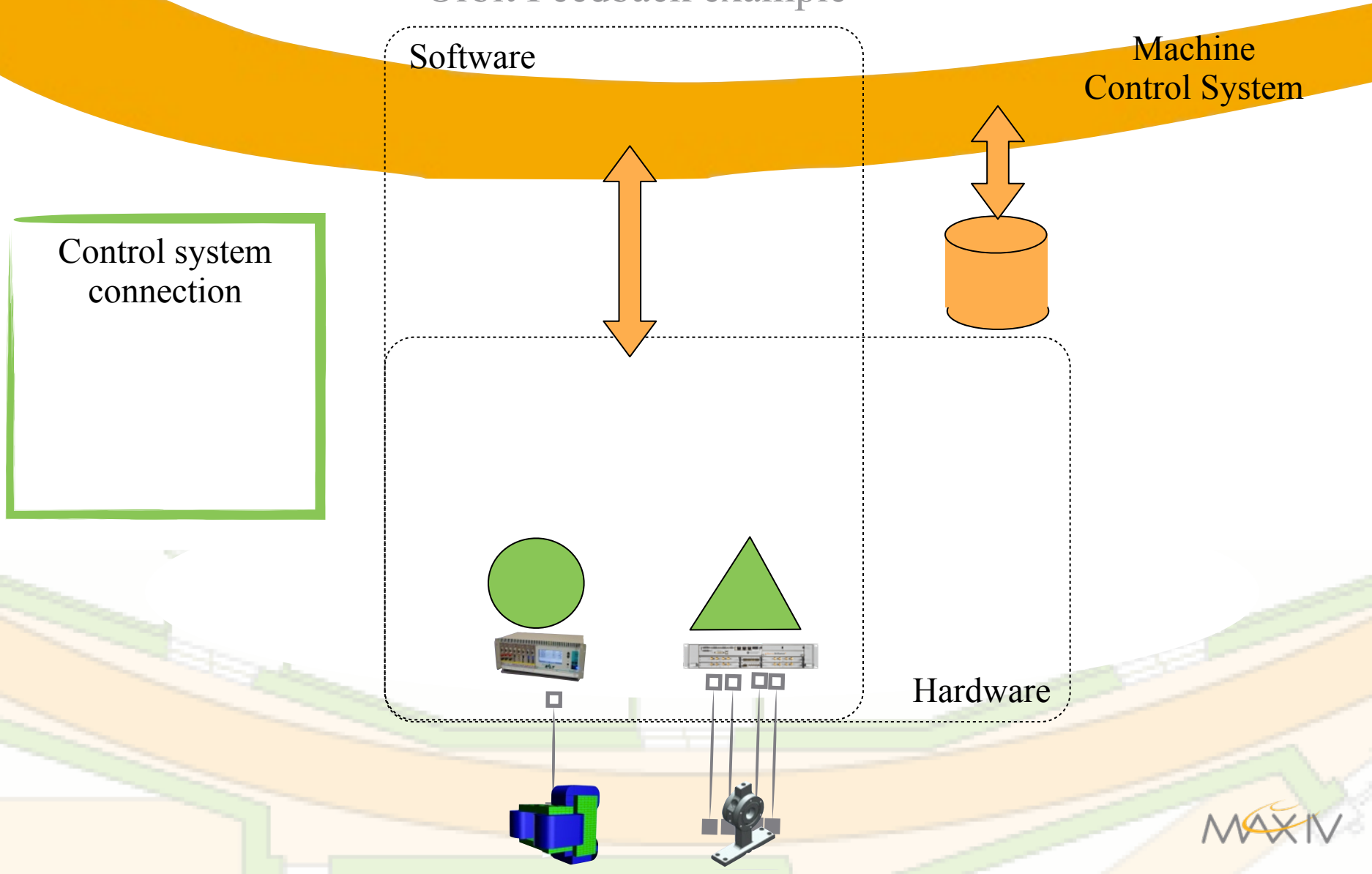
Control system
connection



Hardware

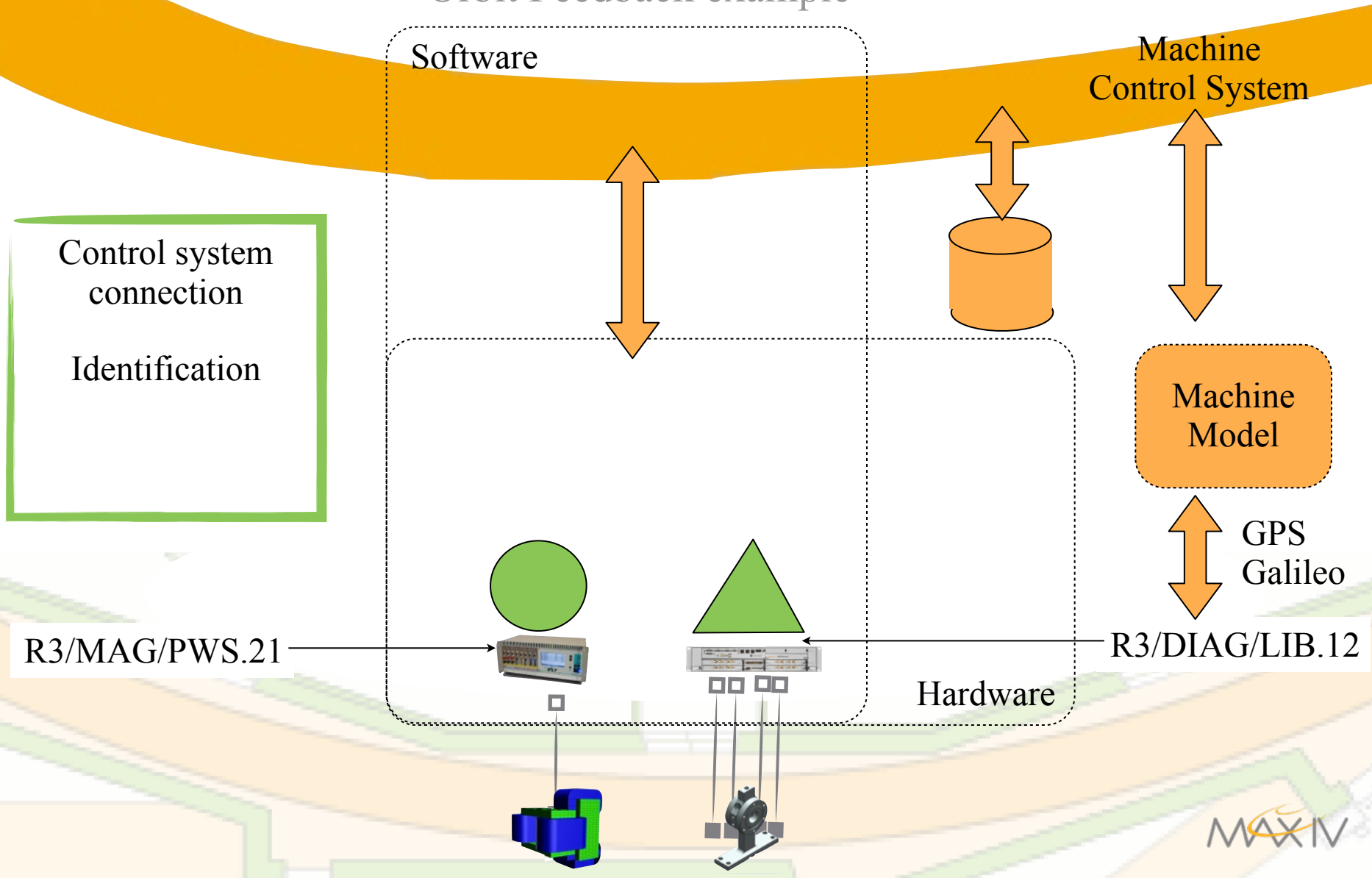
Autonomous Device

Orbit Feedback example



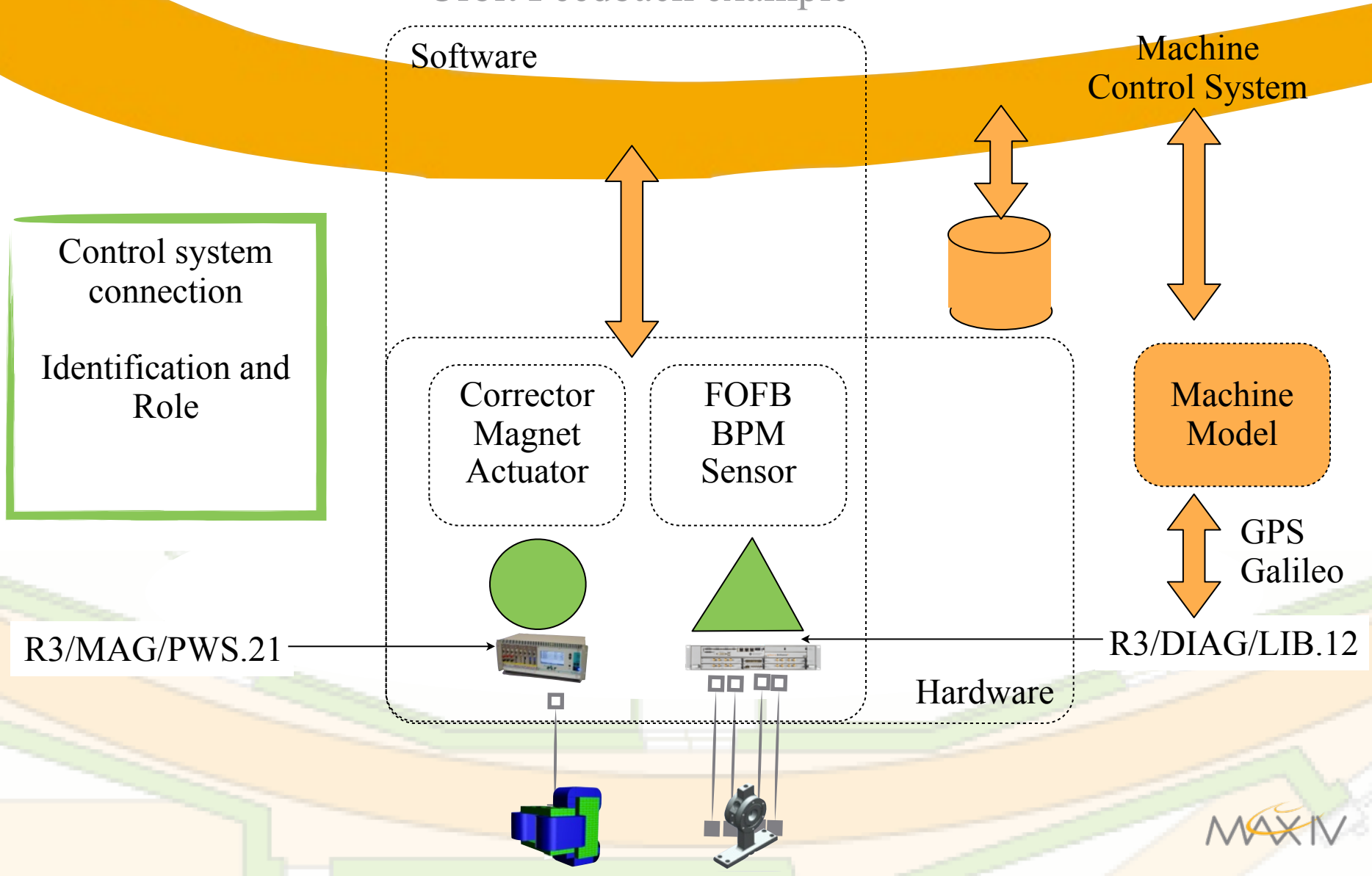
Autonomous Device

Orbit Feedback example



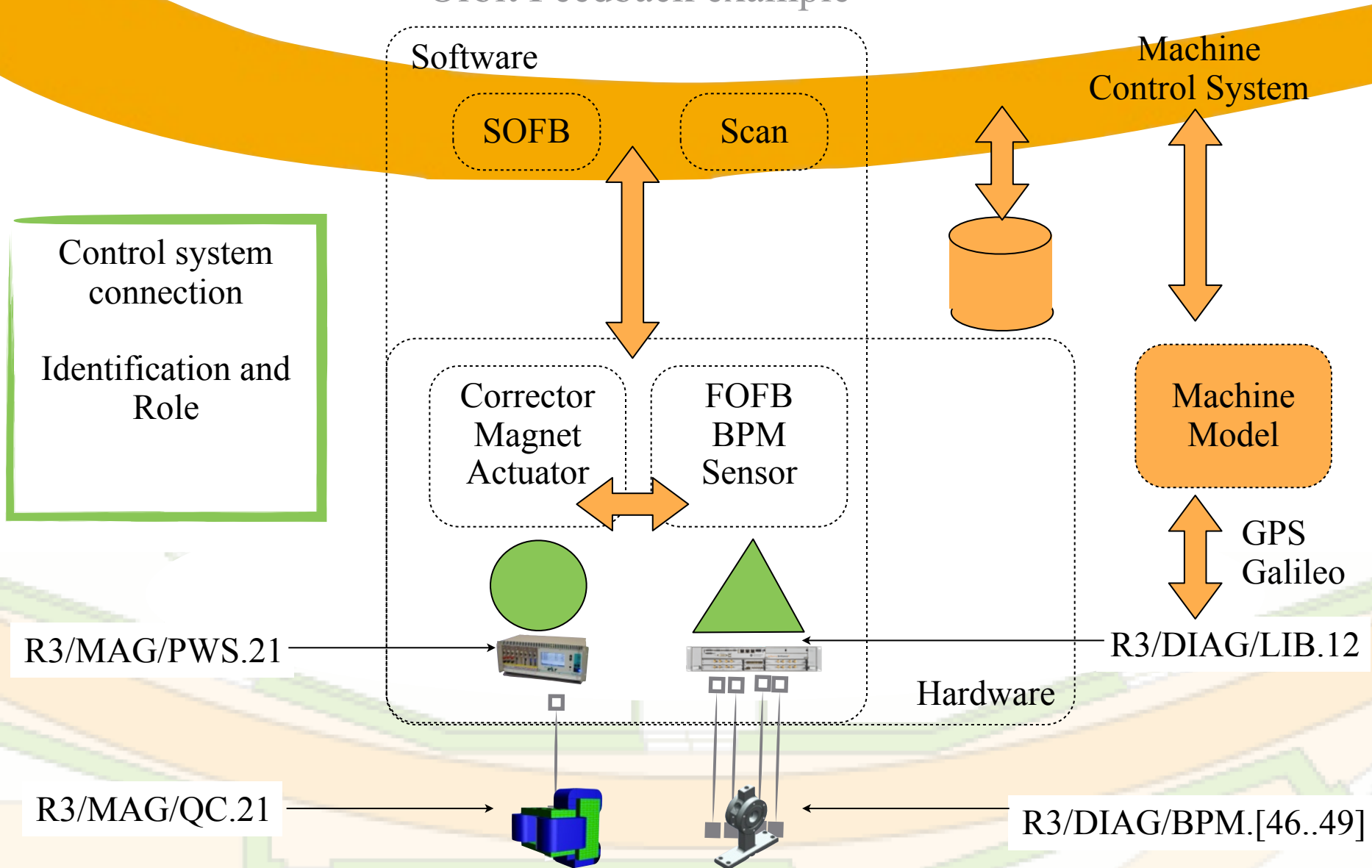
Autonomous Device

Orbit Feedback example



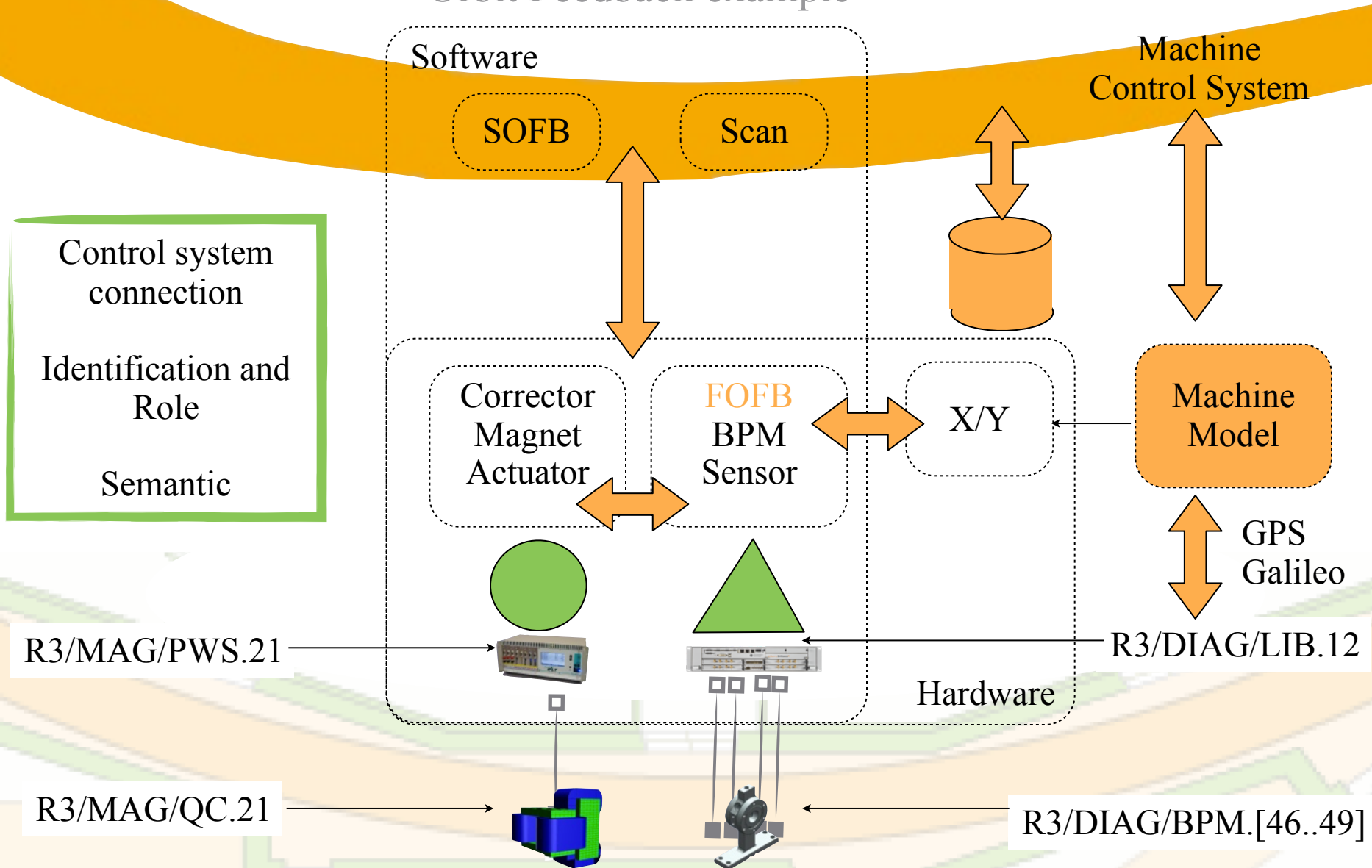
Autonomous Device

Orbit Feedback example



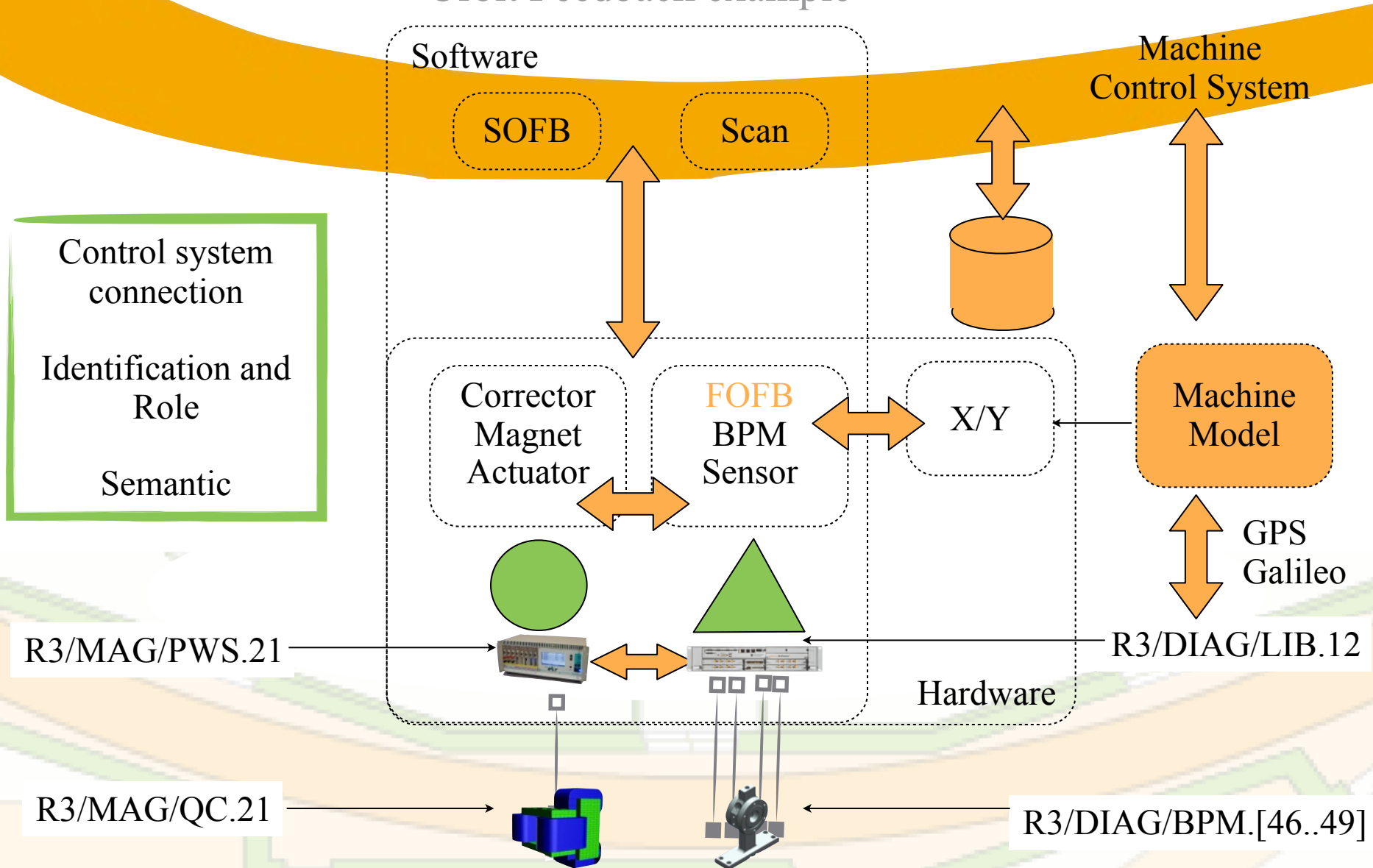
Autonomous Device

Orbit Feedback example



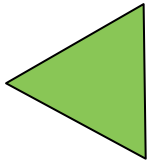
Autonomous Device

Orbit Feedback example



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

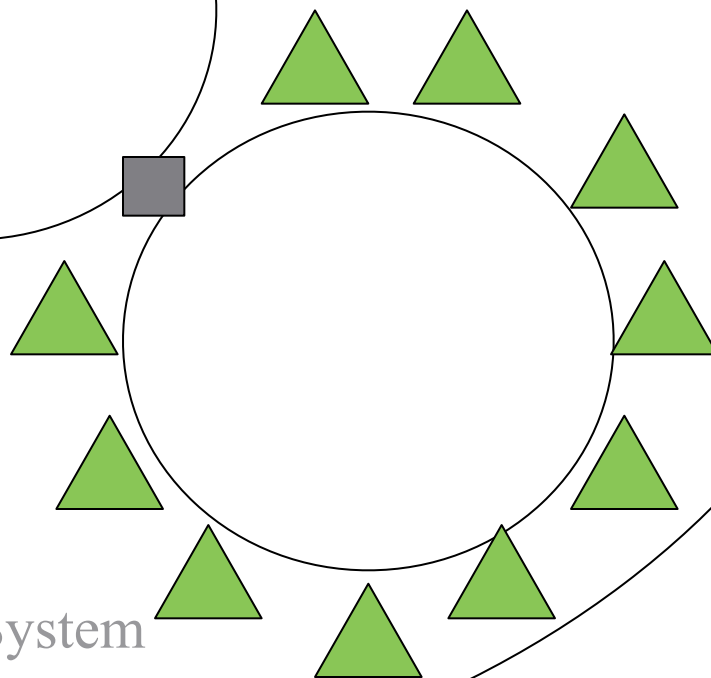
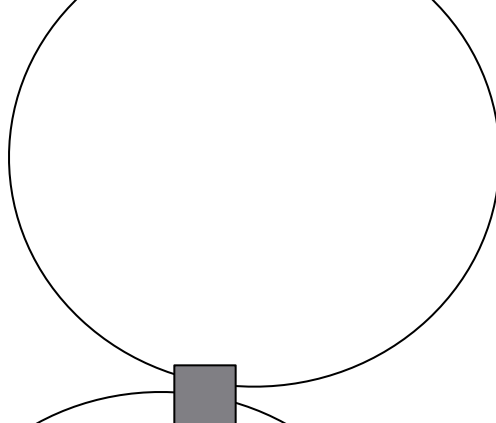
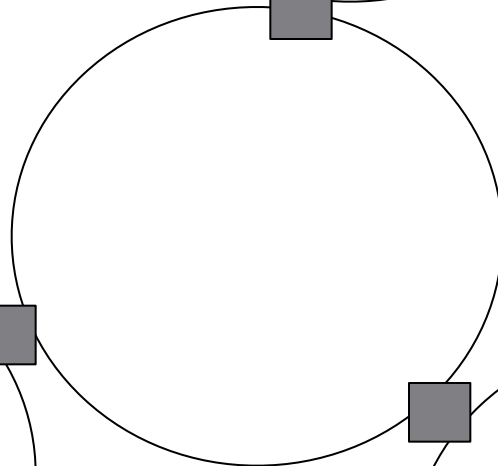
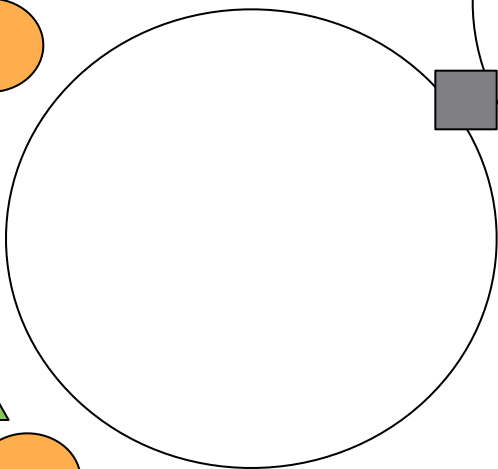
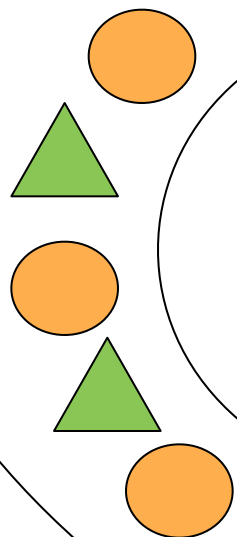
Standardisation

Ontology

Semantic

Artificial Intelligence

Conclusion



Interconnected Control System

Credits

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

Nazbatag: http://en.wikipedia.org/wiki/File:Nabaztag-IMG_1666.jpg

Daft Punk: <http://torsoboyprops.deviantart.com/art/Daft-Punk-259138170>

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

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

Computer: <http://techtoucian.deviantart.com/art/Computer-Icon-191888919>

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

Tablet: http://en.wikipedia.org/wiki/File:IPad_3.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

Smart cities: http://www.alexandra.dk/uk/services/publications/documents/iot_comic_book.pdf

IOT infography (things and cow): <http://share.cisco.com/internet-of-things.html> (not CC)