

ITU Workshop on ICT Innovations

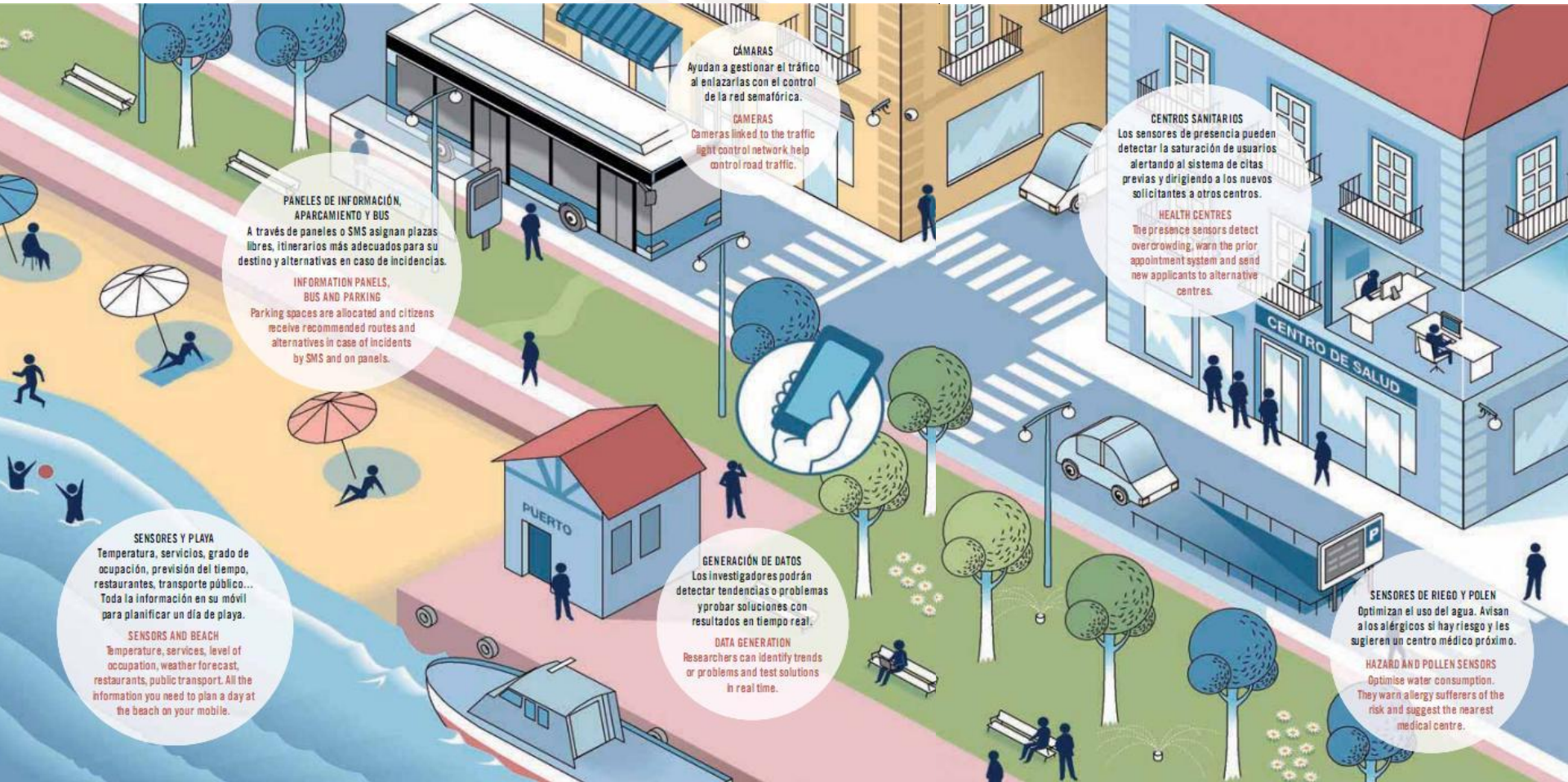
(Geneva, Switzerland, 20-21 March 2012)

The SmartSantander Project: Innovating at a city-scale

**José M. Hernández-Muñoz,
Project Manager, Telefonica
jmhm@tid.es**



SmartSantander has been working to identify essential Smart City service areas



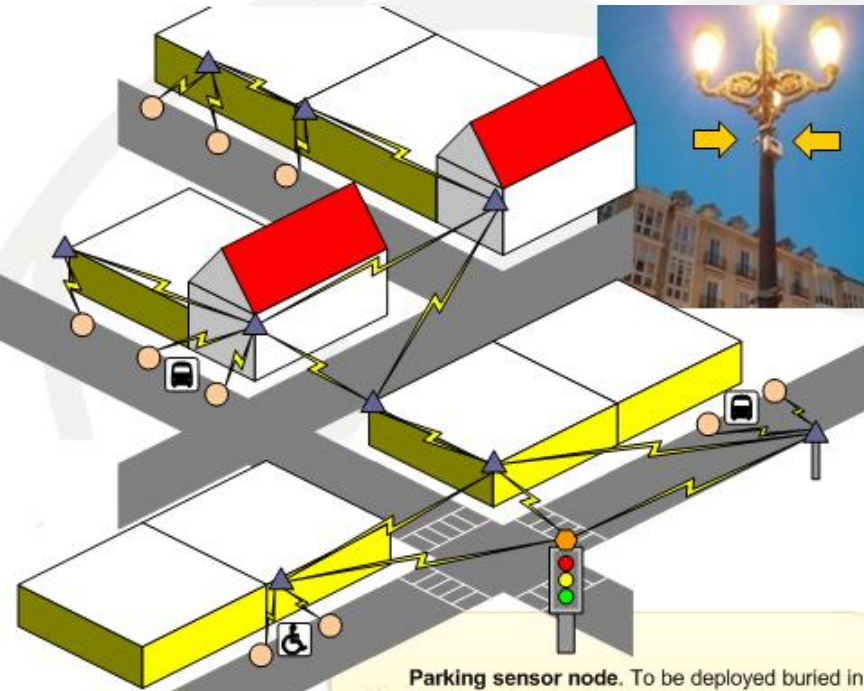
Phase 0
350 devices
Apr 2011

Phase 1
2,000 dev.
Sept 2011

Phase 2
5,000 dev.
Dec 2012

Phase 3
20,000 dev.
Oct 2013

First project phases activity areas: Mobility and traffic management



- Vehicles detection in:
 - Loading/unloading areas
 - Urban transport bus-stops
 - Limited-time parking lots
 - Areas reserved for people with reduced mobility
- Pollution (CO, noise)
- Weather (T, humidity, etc.)

Parking sensor node. To be deployed buried in the asphalt. At the corresponding load/unload area, bus stop or handicapped-reserved space.

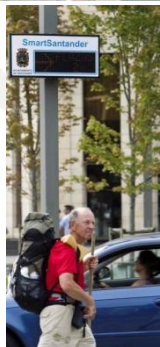
Repeater. To be deployed at available street lights or traffic lights.

Gateway. Connected to Internet/Intranet.

Radio link



SmartSantander: Current progress and preliminary outcomes (Jan '12)



Heterogeneous sensor technology & network infrastructure is necessary

The type of sensors, RFID tags and mobile devices to be used to build smart scenarios is very much related to the different services/use cases to be implemented, i.e.:

- **Public Transportation and traffic control**
- **Parks and gardens control and management**
- **Environmental management and monitoring**
- **Public buildings, installations monitoring and management**
- **Street lighting, waste management, etc.**



A wide range of devices is considered in these scenarios



Personal care and assistance

802.15.4 / ZigBee RF modules



RFID tracking



Environmental: Temperature, humidity, pressure, ambient light, CO₂, wind speed ...

ZigBee / 3G, LTE, WiFi, Ethernet gateways



GPS, presence, smoke & gas detectors, IP video cameras

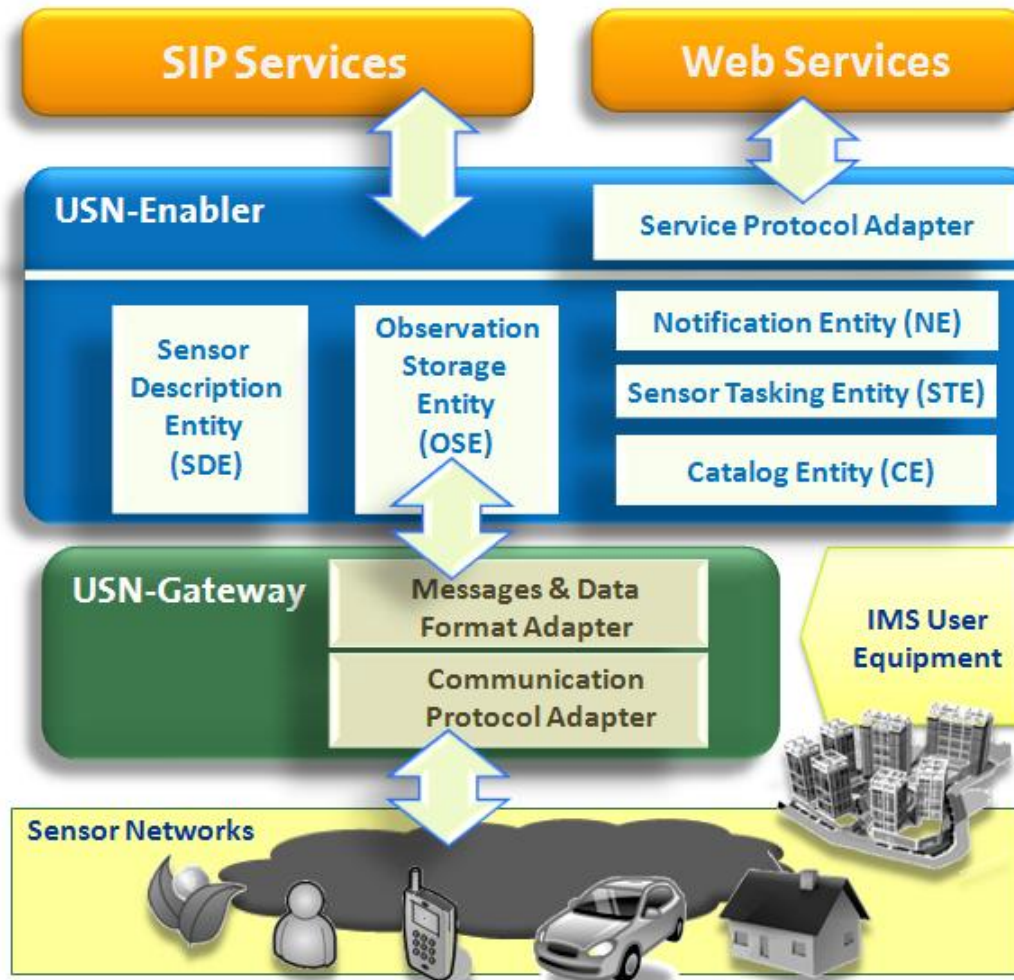


Micro-controllers

ICT Platforms are of the utmost importance to create intelligence out of data

USN - Gateway:

- **Abstract and efficient communication management** (Service-Oriented Communication)
- **Bridging machines /sensors/actuators to unified communication protocols** (SIP)
- **Unified communication network management**, xDSL, GSM, GPRS, UMTS, LTE, WiFi, ...
- **Defined as IMS User Equipment**

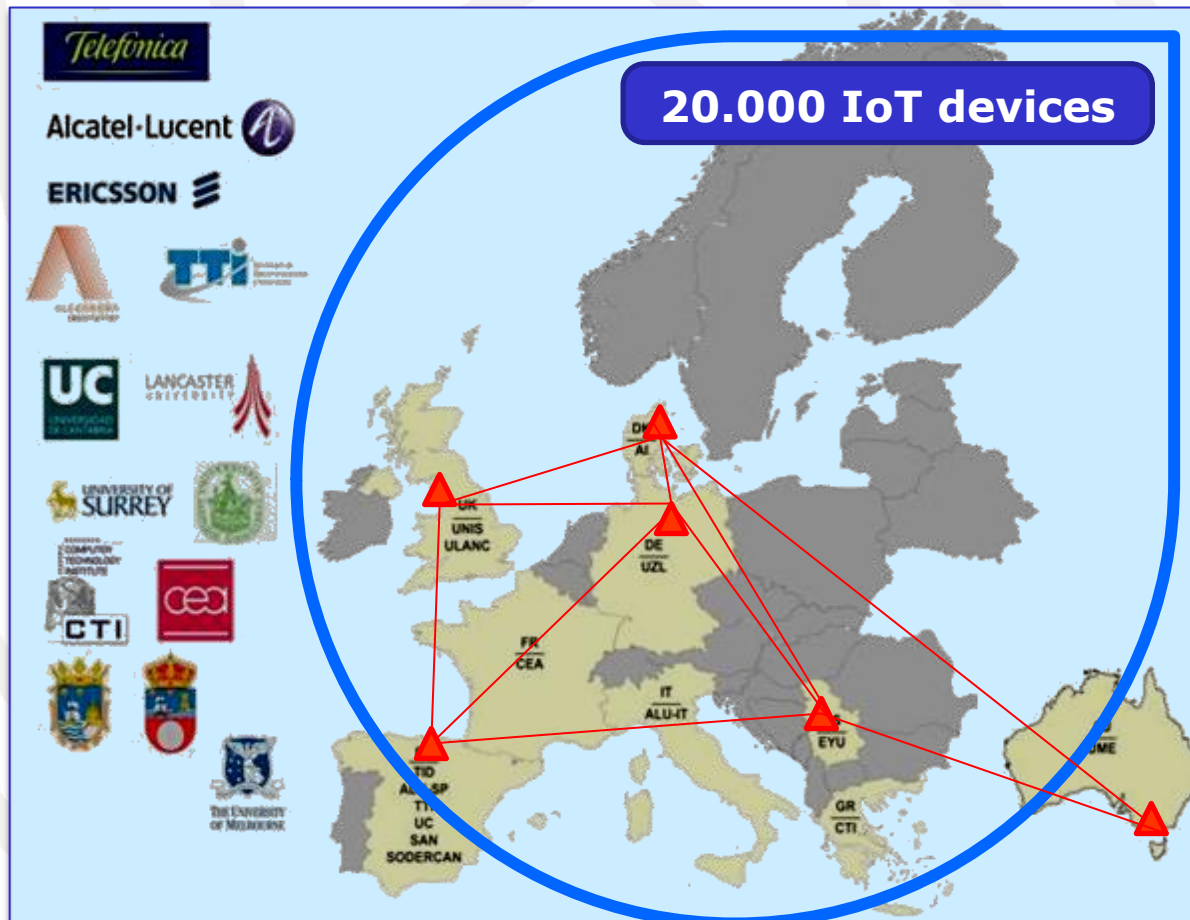


USN - Enabler:

- **Resource Discovery:** look-up registered machines/sensors
- **Observation Storage:** information repository
- **Publish-Subscribe-Notify:** simple & complex conditions and events.
- **Homogeneous Remote Execution capabilities**

Real World makes necessary to validate technology in large scale real settings

Smart Santander aims at providing a European experimental test facility for the research and experimentation of architectures, key enabling technologies, services and applications for the Internet of Things (IoT) in the context of the smart city



Smart Santander Highlights

- **Targeting:**
 - Researchers
 - End users
 - Service providers
- **Duration / Kick-off**
36 months / Sept 2010
- **Consortium**
15 +4 Organisations
9 EU countries + AU
- **Budget / Funding**
8.76 M€ / 6 M€
- **Resources**
630 PM

What makes SmartSantander different of other Smart City initiatives?

The Service-Research Duality



Applied research

Experimentation on IoT technologies, FI architectures, and new services and applications

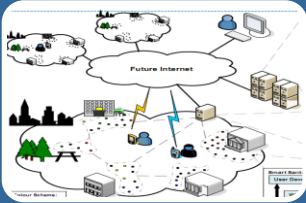
Open integration platform

Testbeds federation and support for heterogeneous device technologies

Business enabling platform

Exploitation of real world cross-domain information based services in diverse usage areas

But technological aspects cannot be considered independently anymore!



Architectural reference model definition
Specification and design of the facility



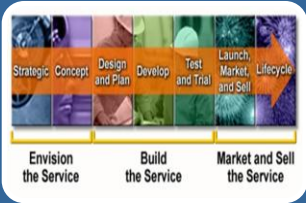
Implementation of the system
Infrastructure deployment

Licenses & Legality



Services & applications: Use cases for both the research community and the end-users

Users & Government



Business models and sustainable exploitation combining research & service support

Sustainability

Conclusions and recommendations

- **Internet of Things (IoT) technology, as a whole, is one of the most powerful enablers for making the Smart City paradigm a reality.**
- **SmartSantander addresses some key challenges of future Smart Cities under a holistic approach to ensure the materialization of the concepts and the sustainability of the deployed infrastructures.**
- **Further to a cross-regional and cross-national co-operation, leaded by local and regional authorities, the project promotes a dialogue among companies, businesses, citizens, and ICT researchers and developers applying user-driven innovation methodologies.**

Smart Santander project recognized with the
Future Internet Award
Smart Santander recibe el premio
"Future Internet Award" a la mejor
iniciativa europea sobre Internet del Futuro

The project scored
very highly across
all three
categories of the
evaluation:

- **Scientific and technological Excellence**
- **Quality of Management**
- **Potential Impact**

In words of the judging panel

"The consortium is a perfect example of inclusion of local entities, citizens, communities, cross-regional and/or cross-national involvement and contacts with industry."

"There is a dialogue between cities, businesses, citizens, and ICT researchers and developers applying user-driven innovation methodologies."



Presentation of the prize during the closing ceremony of the Budapest's Future Internet Assembly event on 19th, May 2011



SMART SANTANDER

Thank you !