SmartSantander:
"the path towards the Smart City vision"

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“the path towards the Smart City vision”

- Urban environments are becoming denser and more complex facing problems in many different areas: information services, urban mobility, and energy efficiency.

- A big opportunity lies on the utilization of the innovative Internet of Things (IoT) technologies developed in recent years to improve the quality of life of the citizens.

- A number of initiatives are being currently developed worldwide. SmartSantander is one of the most remarkable ones.

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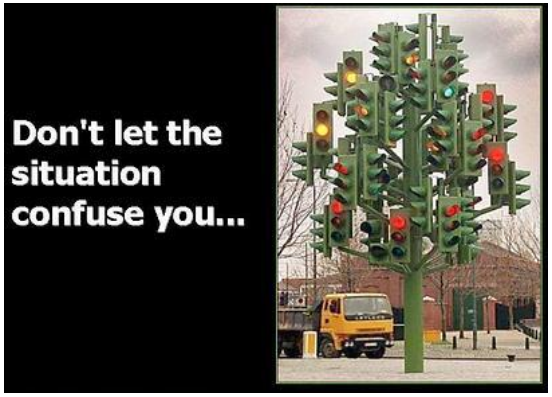
1 Smart City concept

"The 19th century was a century of empires, the 20th century was a century of nation states, the 21st century will be a century of cities"

Wellington E. Webb, former mayor of Denver

The term 'smart' is frequently used with multiple different meanings!



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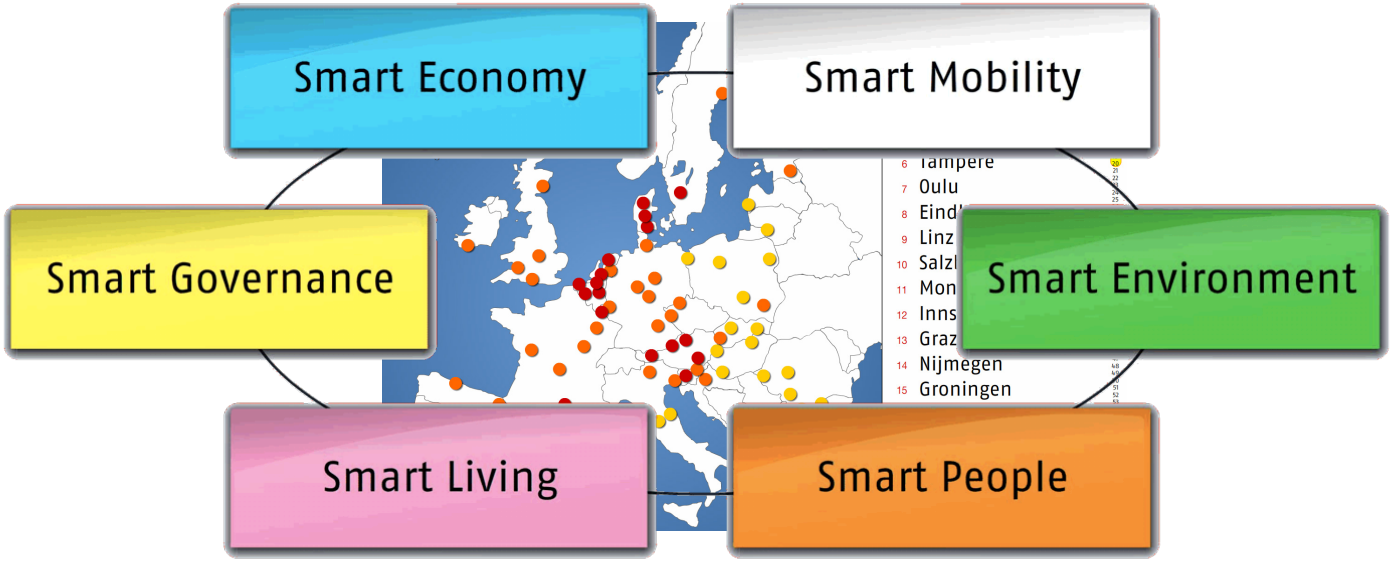
WIKIPEDIA
The Free Encyclopedia

A city can be defined as 'smart' when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic development and a high quality of life, with a wise management of natural resources, through participatory governance

The six Axes of Smart City Development



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A new generation of services, more intelligent, personalized and ubiquitous will arise within cities & urban spaces... affecting many aspects in our lives

A holistic mega-city vision

City marketing

Shopping

Entertainment

Private & public education

Tourism

Culture

Private & public health

Road, traffic, transportation

Application areas

Trends

Service Areas

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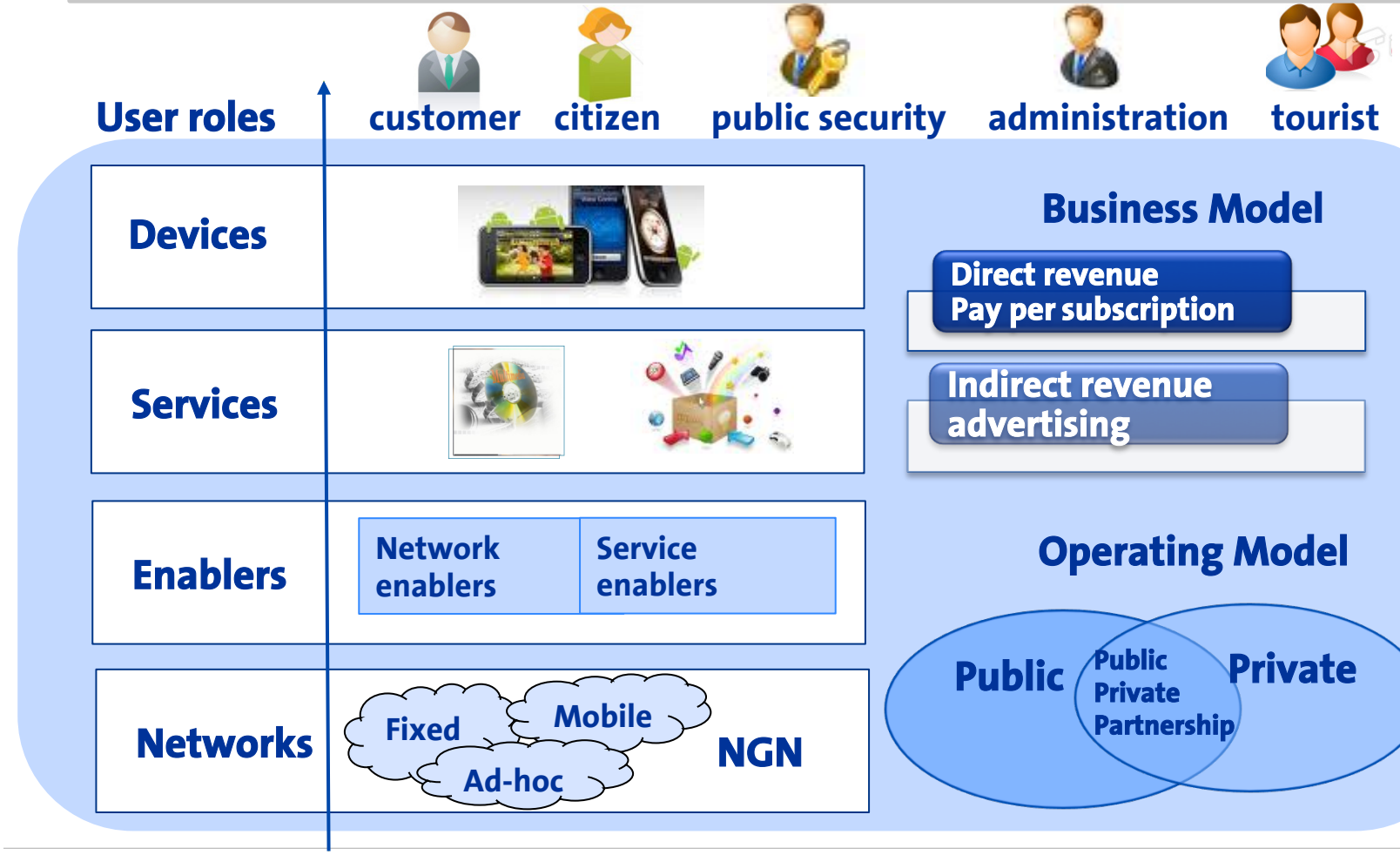
… but business models for Smart Cities are still unclear and requires shaping multiparty stakeholder-system and cooperative business approach



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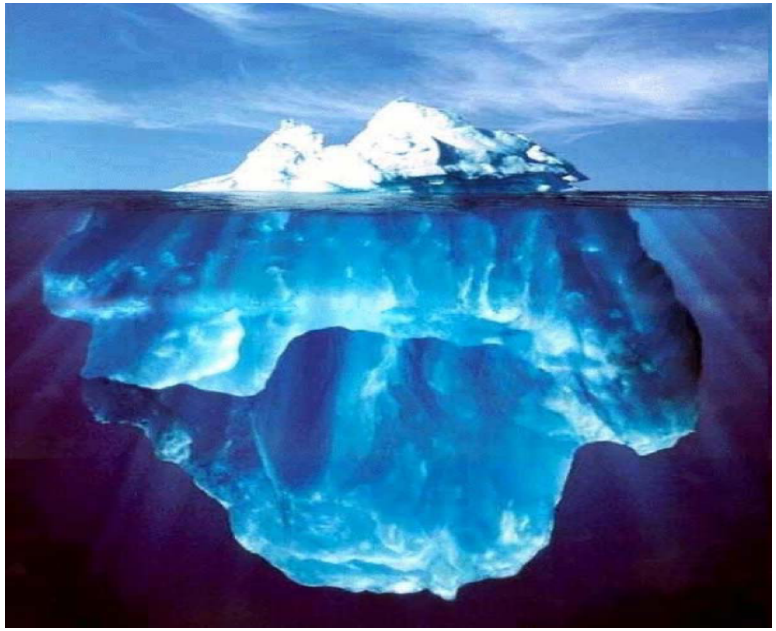
The good news are that first business analysis conclude that several sectors/industries will benefit from more digitalized and intelligent cities

Examples for a city* of 1 million people		
Smart metering	600.000 meters	$120 million opportunity
Electric vehicle charging infrastructure	45.000 electric vehicles	$225 million opportunity
Remote patient monitoring (diabetes)	70.000 people w/ diabetes	$14 million opportunity
Smart retail establishments	4.000 stores	$200 million opportunity
Smart bank branches	3.200 PTMs	$160 million opportunity



Total Worldwide ICT Opportunity ≈ $200 Billion

* *Source: High level estimates given by IDC Report Boston March 4, 2010*

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2 Smart Cities Techology Foundations

ICT technologies can make the Internet of Things paradigm a reality, providing the functionalities required to build up Smart Cities

Internet of Things Concept

- The Internet of Things (IoT) envisions the integration of a myriad of smart interconnected objects embedding pervasive information processing and intelligent interfaces for advanced machine-to-machine, personal and social interaction.

The internet of Things
Björn Raunio 2010
.SE

"The Internet of Things has the potential to change the world, just as the Internet did. Maybe even more so."

Kevin Ashton, 2009
Cofounder of the Auto-ID Center at the MIT

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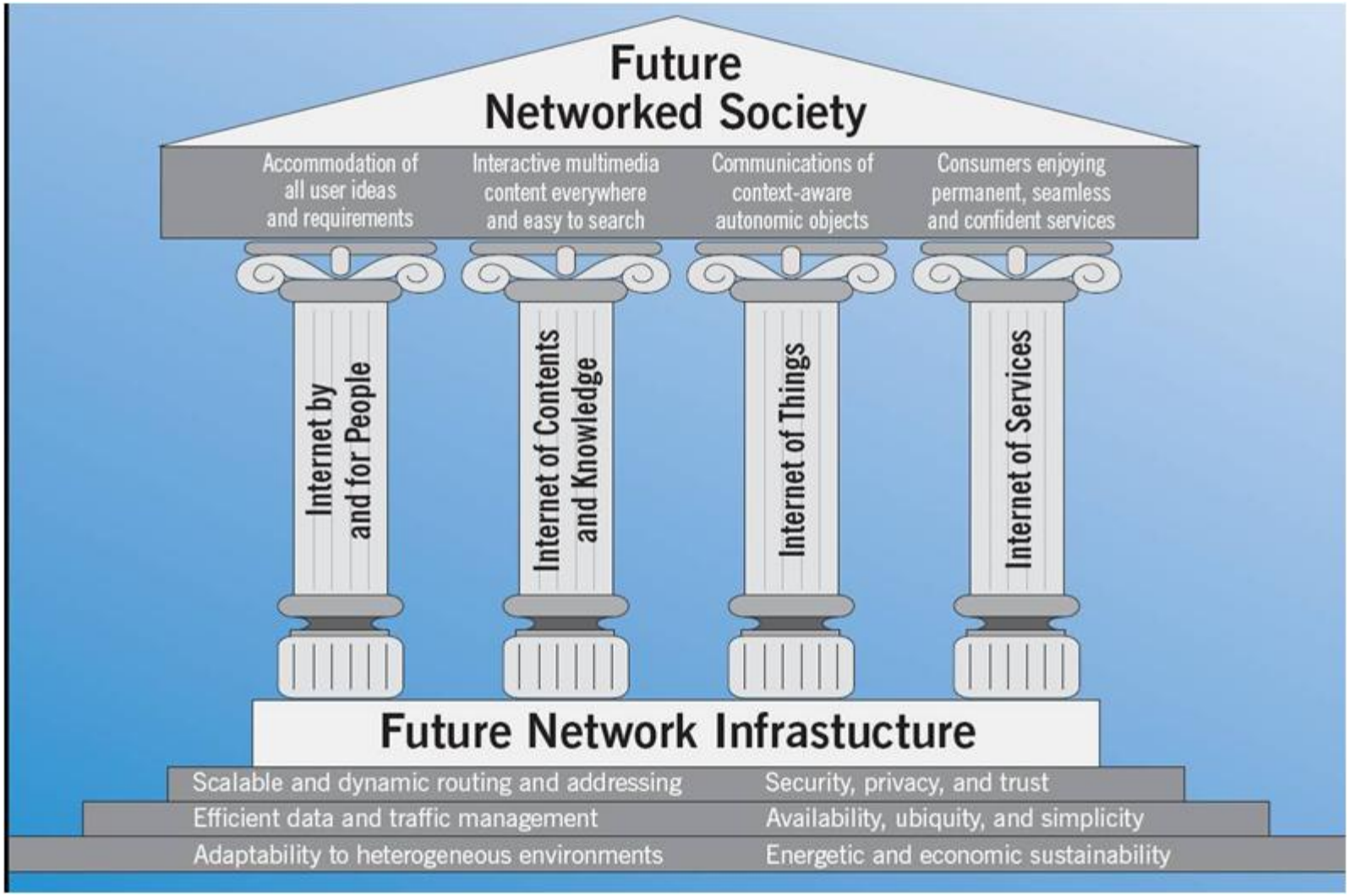
Future Internet



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Internet of Things
History

- The concept of the “Internet of Things” appeared in 2005 when the International Telecommunications Union (ITU) publish the report:

"The Internet of Things", ITU, November 2005.

Internet of Things will connect the world's objects in both a sensory and intelligent manner through combining technological developments in:

- *item identification ("tagging things")*
- *sensors and wireless sensor networks ("feeling things")*
- *embedded systems ("thinking things")*
- *nanotechnology ("shrinking things").*

The ITU also identified as main challenges for the IOT :

- *Standardization and Harmonization*
- *Privacy and Social and Ethical aspects.*

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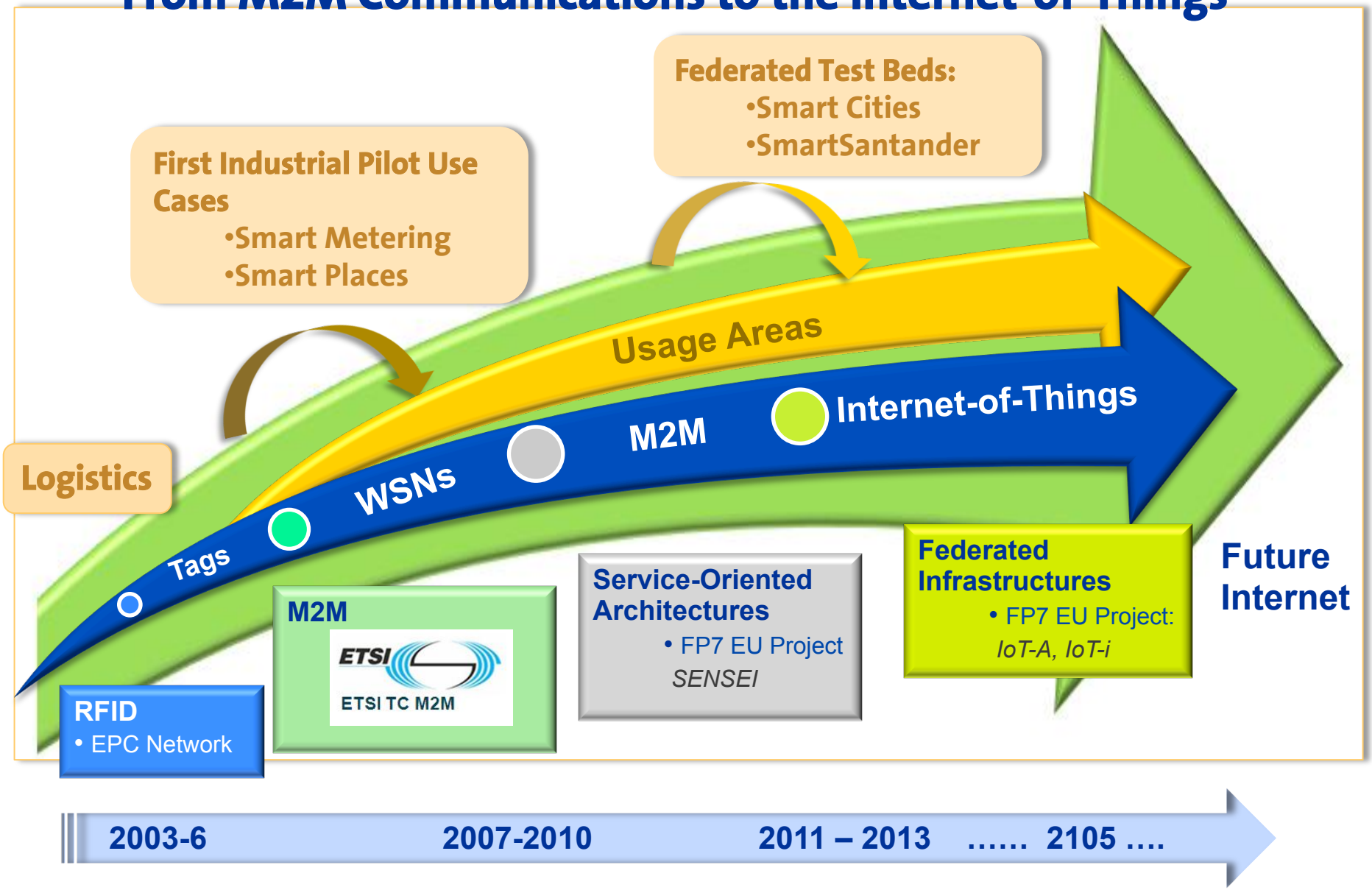
From M2M Communications to the Internet-of-Things



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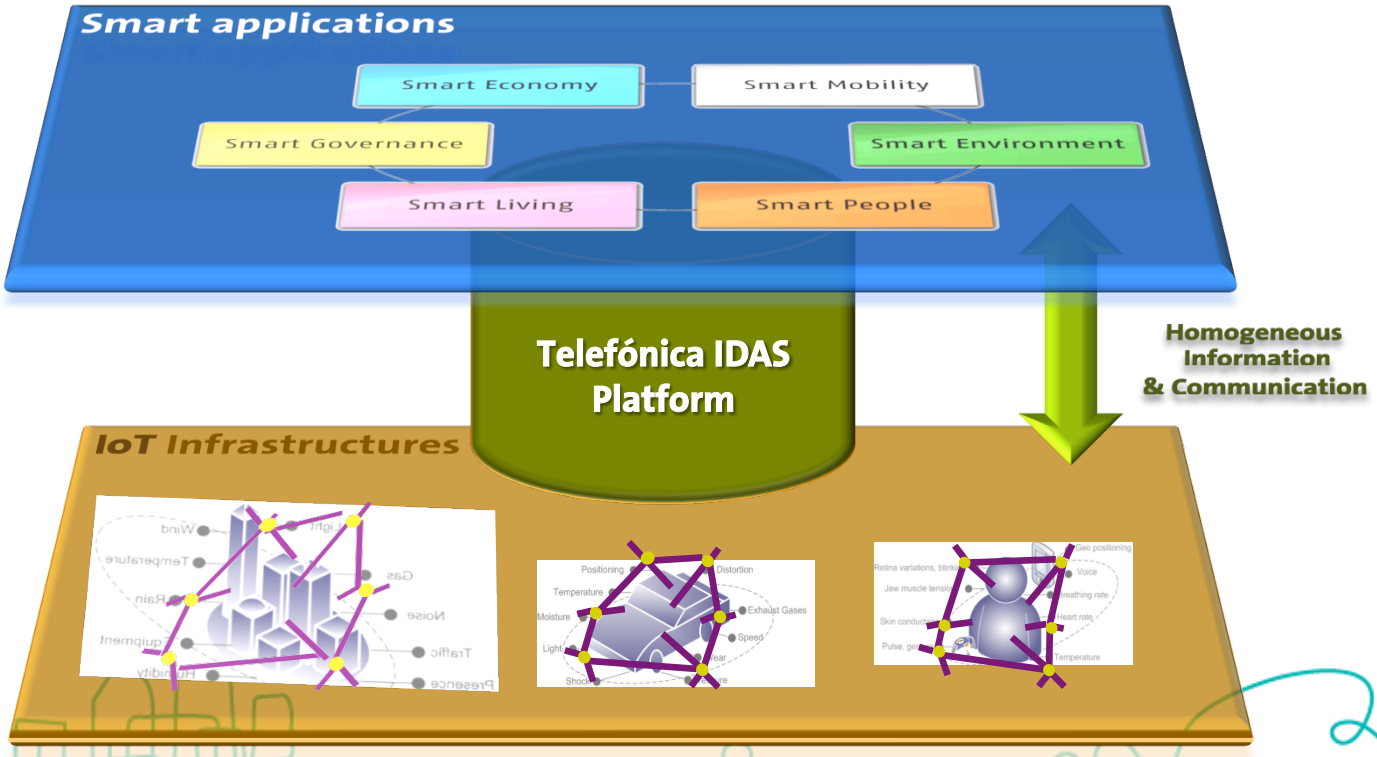
Building the Path towards the Internet-of-Things

- **The efficiency of combining ubiquitous networking connectivity and sensor/actuator technologies (IoT) together with an easy articulation of several applications into interoperable services will shape the future of many industrial sectors**



A Telefónica company

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IDAS: Telefonica Platform towards the IoT

- **Open Business Model:** One service will be able to use multiple information providers and an information will be used by multiple services
- **Unified information modeling:** The information should be provided to the services using a unified information model, regardless the particular information model used by the sensor technologies.
- **Unified communication protocol:** Services should be agnostic to the communication protocol used. The platform should provide access to the information regardless the particular underlying communication protocol used (ZigBee, 6LowPan, ISA-100.11.a, etc.).
- **Capabilities to store and analyze information:** Internet of Things devices will providing huge amounts of data. Extracting information from data is key
- **Horizontally layered approach:** The platform should be build following a layered approach, so services and networks are decoupled in order to evolve independently

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3 Research Infrastruc-tures

SmartSantander

Call FP7-ICT-2009-5
Proposal Number: 257992

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.

SmartSantander project highlights

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

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Research driven and open to experimentation…
… but other user profiles are also considered

Typical user profile

- Researchers (Future Internet/IoT)
- End users (social impact)
- Service providers

Types of experiments

- Building blocks for IoT architecture and validation
- Impact of IoT on Networks and service layer integration
- Privacy and trust evaluation and user acceptance
- Information aggregation and mining

Use cases

- A tentative list of concrete use cases has been suggested within the proposal
- The first use case will be implemented based on an evaluation of users needs and is not pre-concluded
- The project uses User Driven Innovation methodologies to design use cases

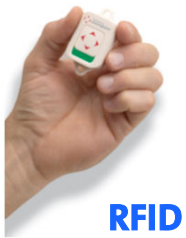
The testbed will involve a wide hardware infrastructure & sensor type diversity

- **The type of sensors and mobile devices to be used is very much related to the different use cases that the project is planning to implement, some of them being related to:**
  - Public buildings, installations monitoring and management
  - Parks and gardens control and management
  - Public Transportation and traffic control
  - Environmental management and monitoring

- **Wide range of sensors and mobile devices is considered**

ZigBee / 3G, WiFi, Ethernet gateways

ZigBee RF modules

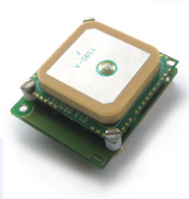


Micro-controllers

RFID tracking

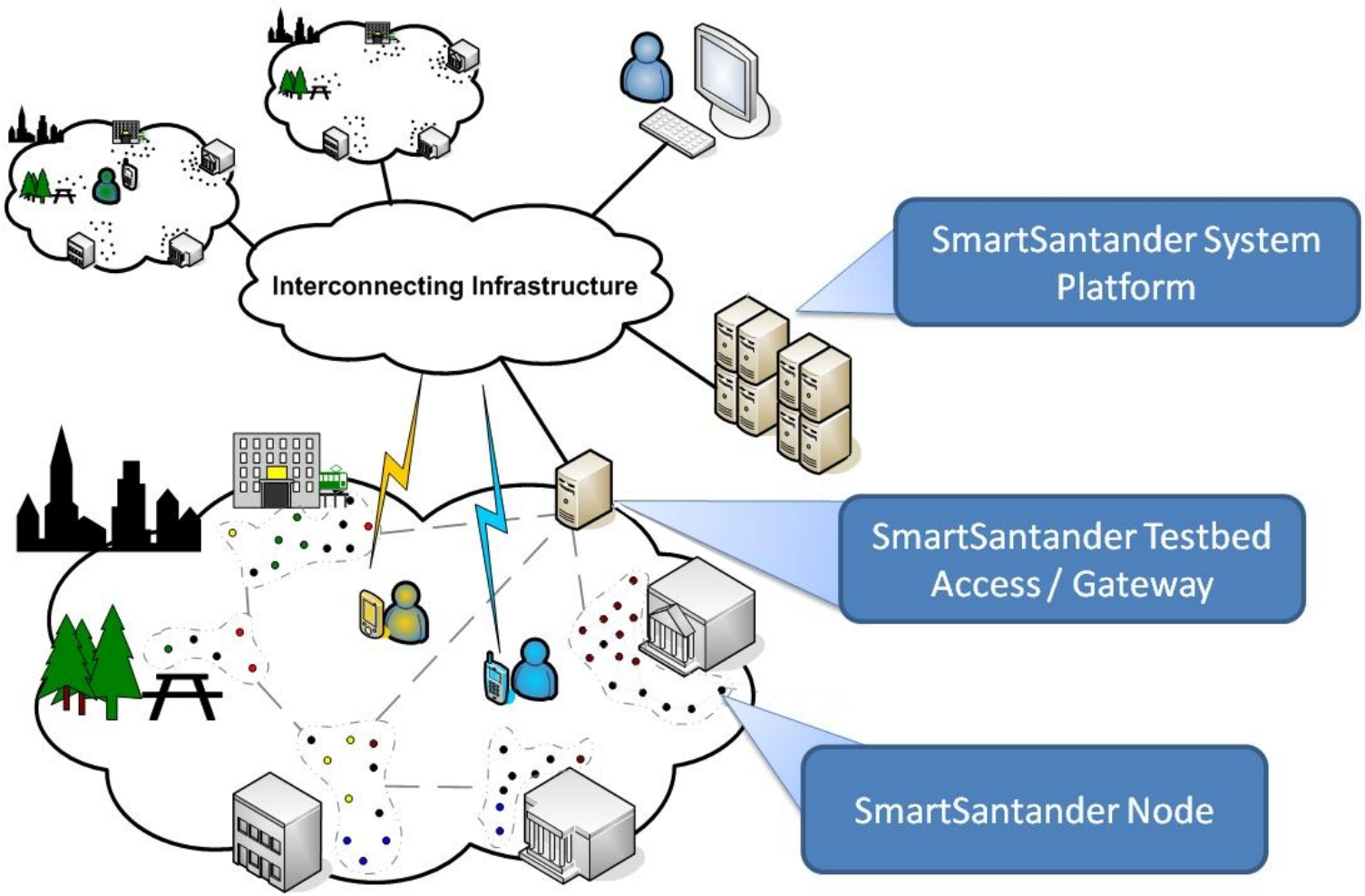
Environmental: Temperature, humidity pressure, ambient light, CO_2, wind speed ...

Personal care and assistance



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

SmartSantander IoT architecture building blocks



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.... open to experimentation...

- SmartSantander proposes a unique in the world city-scale experimental research facility open to support of typical applications and services for a smart city.
- One of the main objectives of the project is to fuel the use of the Experimentation Facility among the scientific community, end users and service providers in order to reduce the technical and societal barriers that prevent the IoT concept to become an everyday reality.

SmartSantander will provide two Open Calls during the whole duration of the project following the rules indicated by the EC.

- ✓External users can be funded to run experiments using SmartSantander
- ✓Experimental Facility, will be managed as described in the ICT FP7 Work Programme.

For more information:

Visit us at
http://www.smartsantander.eu

Thank You!
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