T-MOBILITAT :

Connected Transport, Connected Living

Barcelona is revolutioning the mobility concept.

ATM Àrea de Barcelona
Autoritat del Transport
Metropolità

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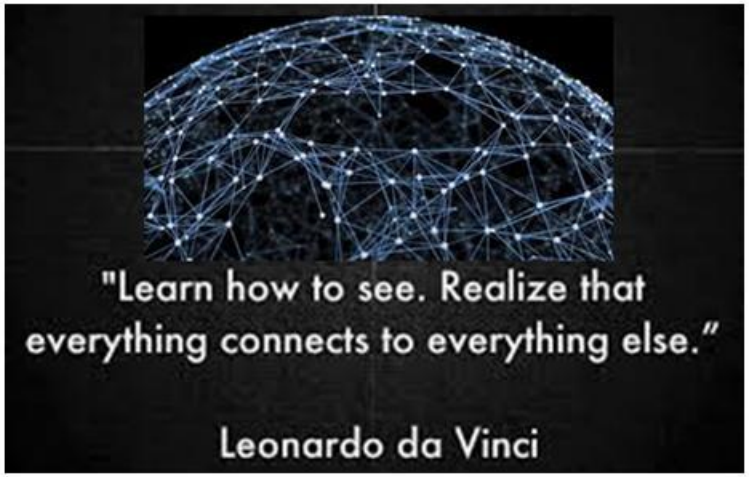
SOME FOREWORDS

- Our world is already an hyper connected world. Real time and ubiquitious based systems come to the fore.
- Public transport can no longer be a closed environment formed by operators and authorities, but a world taking part of a complex and cooperative global ecosystem.
- Transport enabled to serve to continuously and rapid growing of customers' needs.
- The spread of the new technology as a leverage for the new transport model to rise.
- Definitely, mobile, ioT are set to usher in a new era for public transport.
- Creating value, capturing value and accelerating growth with business contributing models.
- It is necessary to design for the delivery of value, connecting, joining points..

SOME FOREWORDS

From Leonardo …



to Steve …

The exciting path ahead … !

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- The next generation of public transport: The pace drawn in Barcelona, Catalonia
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- Summary

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Intelligent infrastructure

- Smart objects within a new architecture
- Machine to Machine (M2M) communication

Process innovation: creation of model

- Machine-centered: capture, analysis, delivery of unprecedented data. Management of data across various players.
- Crowdsourcing: person-centered approach to improved data uses

INTELLIGENT INFRASTRUCTURE: THE PILLARS

Intelligent infrastructure

- IoT demand new architectures. Taking the most of it by utilizing a combination of architecture styles, there's no "the right one"

  Machines, vehicles, and consumer goods will be connected and then to the cloud. Not always will they rely on the cloud to provide computing resources.

  The functionality will be distributed: some data will be residing on the machine, some on the smartphone, and some of it will be stored in the cloud

- Keeping on premises and legacy preexistent machines connected, applicating logic and analytics, prioritizing constraints but making them deliver open and standard compliant results.

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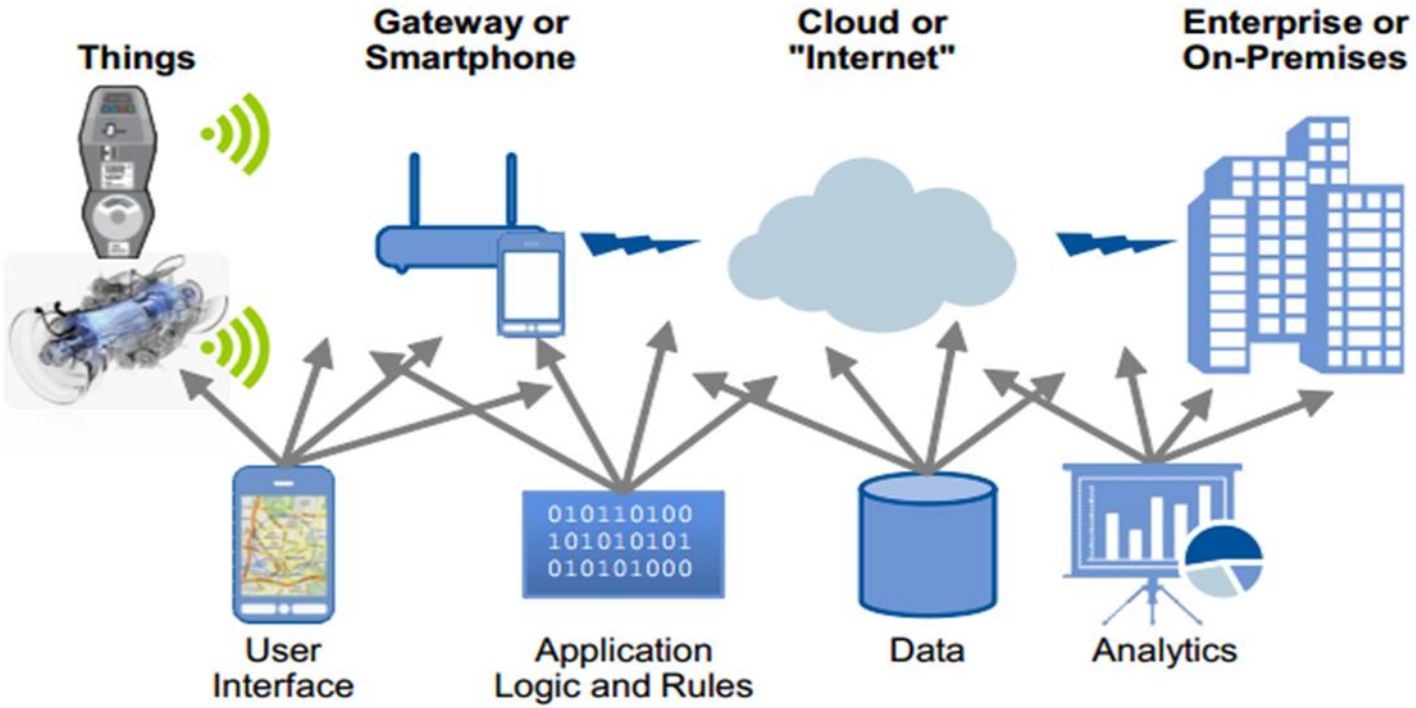
Connected transport, connected living

Intelligent infrastructure

- Implementing Internet of Things by utilizing a combination of architecture styles: thing centric, smartphone centric, cloud enterprise centric
- Strong foundation for hardware. Modular enabling. Dynamic Operations
- Connectivity requirements:
  - Reliability and quality of service
  - Real-time performance
  - Distance and physical constraints
  - Speed and quality of connection
  - Power and storage requirement

High level IoT architecture



GUI, application logic, data and analytics can be placed anywhere

GUI = graphical user interface

Source: Gartner (September 2014)

Process innovation: creation of model

- Machine-centered capture, analysis, delivery of unprecedented data. Management of data across various players.
- Crowdsourcing: person-centered approach to improved data uses
- Clear chart and action plan with awareness of surrounding ecosystem, thread of failure if not assuming the need for a well designed, comprehensive, reliable, win-win cooperation model. Technology is *only* an enabler.

Big Challenges

Big Data

Facing the 5 V's: Managing unprecedented **VOLUMES** of data, Substantial **VARIETY** in the types of data, **VELOCITY** in collecting, analyze, and delivering. **VERACITY** and **VALUE.**

Security

Undelegating responsibility for ATM to guarantee a reliable, trustworthy end-to-end system

Privacy

Balancing between fitting user needs and rights

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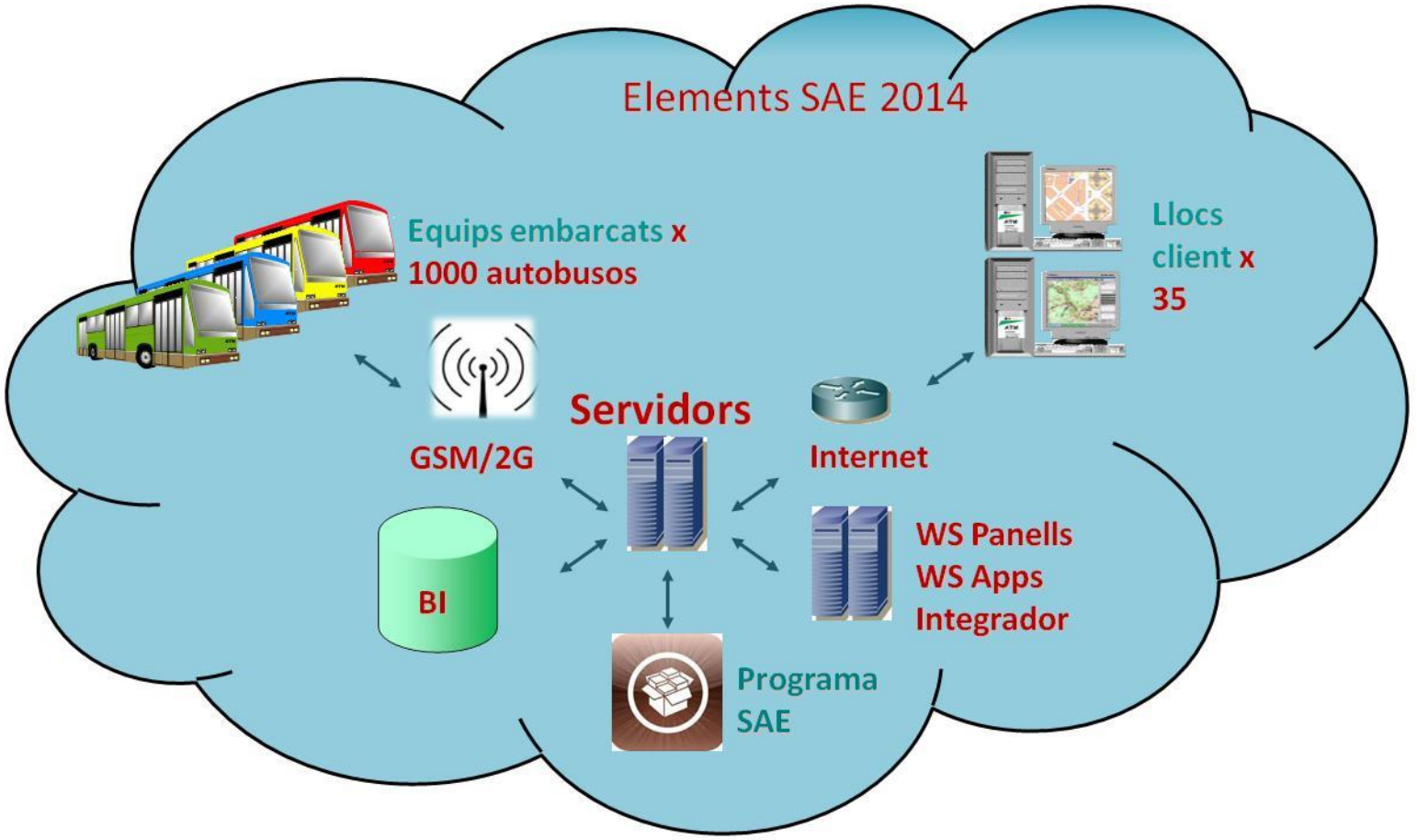
THE ALREADY PAVED PATH: COMPLETE FARE INTEROPERABILITY SINCE 2001

- **ATM is the inter-administrative consortium** for the coordination of public transport in the Area of Barcelona. (City and surrounding 253 municipalities).
- **Whole Integrated Fare Management System** (2001).
- **Transport tickets valid in all modes and all operators**. Zone based. Transfers despenalized within a time slot.
- **Financial hub of the transport system**. (Clearing Chamber). Instrument of control. Pay for service given. Trust.

NOT ONLY TICKETING … FLEET MANAGEMENT

- We take the most out of preexistent systems to combine with the new ticketing and information technology for the next generation of public transport and mobility



TAPPING THE COLLECTIVE INFORMATION

Global, INTEGRATED information is a priority ...

Next generation of public transport: the pace drawn

BARCELONA'S JUST BORN T-MOBILITAT PROJECT

More than 70 operators involved: metro, train, tram, buses, 1000M trips/year
In an Open, interoperable, up-to date on contactless technologies and media.

The new ticketing system is almost here! Public visibility from late 2015

Next generation of public transport: the pace drawn

TAKING ADVANTGE OF ALL NFC TECHNOLOGY

NFC
NEAR FEILD COMMUNICATION

Open, interoperable, up-to date on contactless technology and media.

Connected transport, connected living

T-10, T-50/30 …

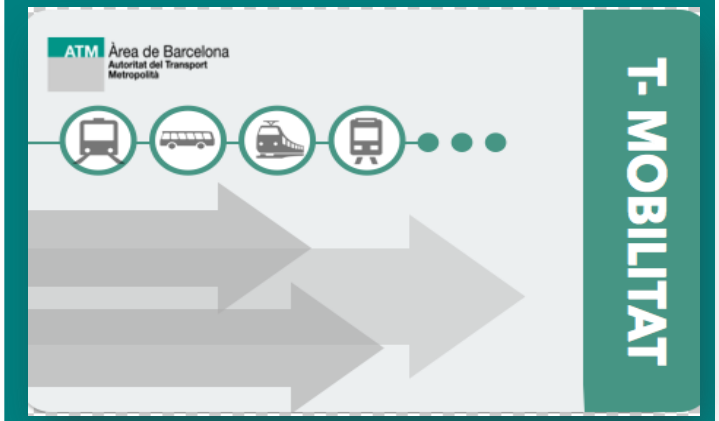
2014

Multiplicity of tickets

6 zones,
different customers' progiles

84 transport tickets

T-MOBILITAT



2018

All-in-one transport app

Next generation of public transport: the pace drawn

NFC MOBILE AS BOOSTER OF THE T-MOBILITAT

- Information means.
- Refilling / recharging means.
- Validating/ ticketing means.

Mobile transport system to help

- **To easy congestion** across the transport system, as it's an effective mechanism to send passengers real-time personalised information
- **To easy the ticket system**, by the refiling of the transport app (either card or handset)
- **To easy the ticketing system**, as an effective mechanism t for flexibility and portable tIcket systems

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WHAT ROLES WILL CONNECTED TRANSPORT PLAY ?

Connected transport

- Connected POV, POS and vehicles as nodes in the Internet of Things in a real-time based architectures basis. Reliable

Mobility as a Service

- Modal integration. Transparent back-office for data provisioning, clearing chamber. Stuck on trust
- Emerging transportation modes: *bicyng*,
- New mobility models: such as car-sharing, car pooling, *bicyng*, etc
- Smart acces to transport & mobility data.

New business, operational models

- New players, rapid growth
- Mobility Apps

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BEYOND PUBLIC TRANSPORT

A system thought by the Public Transport and for the Public Transport … into a scope of Mobility as a whole

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Thank you!

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