Boosting
Digital Transformation

PROJECT IDEA :

AN INTEGRATED FRAMEWORK FOR A CONTEXT-AWARE MOBILITY

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PROGRAM MANAGER
SMART TERRITORIES DEPARTMENT

Up to 10 European and French projects.

10 year-experience in R&D as Research Engineer and Project Manager.

Keen on Smart Cities, Smart Mobility, Energy and Middleware domains.

PHD Graduated from INSA Lyon, in middleware and Service-Oriented Architectures.

"Be yourself; everyone else is already taken". Oscar Wilde

CONTACT DETAILS

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SystemX
Technological Research Institute

Data science and Interaction

Systems & Software Engineering

Infrastructure and Networks

Scientific Computation &Optimization

Partners

83 Industrial partners

24 Academic laboratories

Researchers-engineers and doctoral students

100 researchers-engineers, 30 doctoral students

Research projets

23 projects ongoing and 13 projects completed

Finance

Industrial financing

French Research National Agency

130 M€

Numbers

8% of rail passengers growth per year in EU

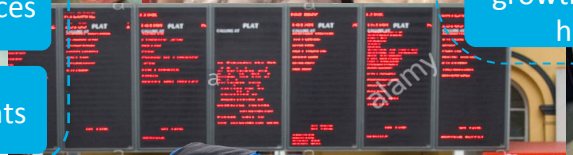
1043 millions passengers 2017

+44% of passengers growth during summer holidays 2017

Demand-driven

Many mobility preferences

Many mobility constraints



Objectives

How to offer to each passenger a door-2-door transport that is **greener**, **faster**, **cheaper**, **with few walking distance**, **with shops**, **without shops**, etc ?

How to reduce (as much as possible) infrastructure cost and energy consumption?

Observation: A complex and Multi-layered System

Sensors and Metering
Historical and real-time data

Events can be addressed

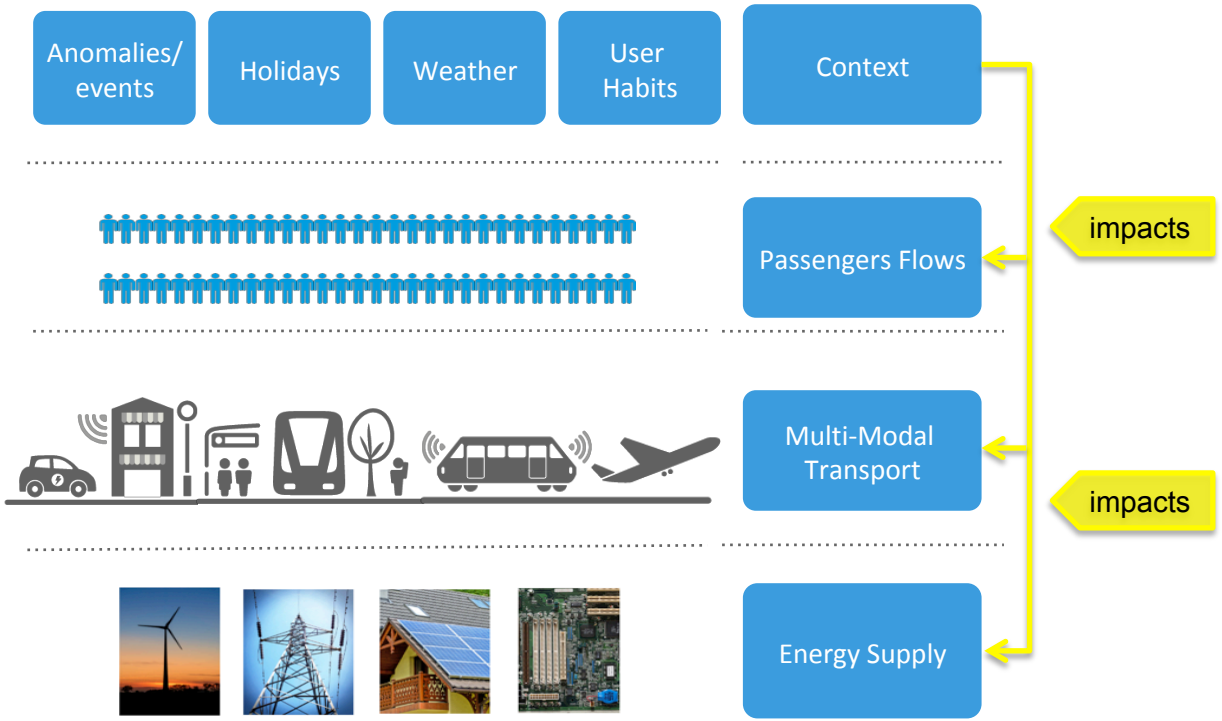
User Habits can be identified

Itineraries can be updated

Infrastructure can be adapted

Weather can be forecasted

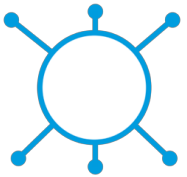
Energy Supply can be secured



Project : An Integrated Framework for a Context-aware Mobility

Our project aims at providing a context-aware mobility that considers all the collected data from sensors, meters, weather forecasts, energy generation, flow measurement to design an integrated solution federating **five** main actors:

- **Energy utilities** for managing the energy-mix for railway power supply: renewable energy production is **forecasted** to anticipate peaks of passengers and to **align** (permanent and punctual) energy (ahead of time and real-time).
- **Power grid system operators**: Invest in **new technologies** to maximize infrastructure ROI and efficiency.
- **Transport system operators**: **Network planning** is computed based on passenger flows and renewable energy generation (long-term). They can be **updated** (in short-term to real-time) to take into account changes in predictions and special events.
- **Mobility service providers** and **passengers**: Passengers can be **recommended** each a customized itinerary. Passengers can be rerouted to other paths without loosing comfort, as their behavior is learnt thanks to **interactive machine learning**.



The consortium should include mobility operators, energy utility, technological service providers,..

IP2 SUPPORT TO DEVELOPMENT OF DEMONSTRATOR PLATFORM FOR TRAFFIC MANAGEMENT

Providing an interoperable middleware that ensures a common model communication between services and data sources.

Interactive ML for identifying user travel preferences

Unsupervised learning for identifying user habits

IP3 FUTURE TRACTION POWER SUPPLY FOR RAILWAYS AND PUBLIC TRANSPORT

A smart grid model that includes optimization techniques for the energy mix.

Mobility network utilization and investment optimization

Multi-criteria optimization for customized paths

IP4 COMPLEMENTARY TRAVEL EXPERT SERVICES

A set of analytic algorithms as a well as a passenger profile model to recommend adapted context-aware and multi-criteria itineraries.

Micro-services based software architecture

Heterogeneous collected data from passengers, stations, trains, events, sensors, ...

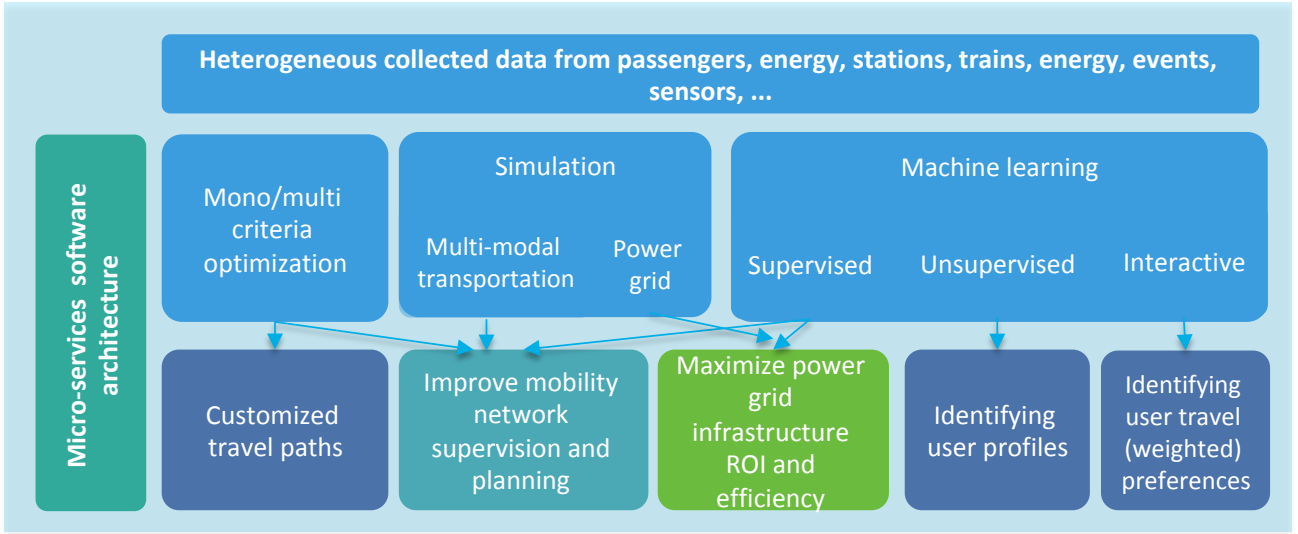
Realization: How can we implement this project?

Permanent Team
21 Data science and interaction,
8 Scientific Computation and Optimization
8 System and Software Engineering

Hub
Connection to a hub of partners, cities, academic and industrial in digital, energy, and transport fields.

Background
Several Research and Innovation 3 ongoing Projects in Mobility, 2 Energy, 2 autonomous vehicles, ..

European Projects
Several H2020 European Projects, In2Rail, Holiship, TOICA, ..



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