

ARTES ISAAC
Life Sciences & Healthcare Tech

Mobility and Transport:

**Tracking veicoli, costruzione di matrici origine destinazione, traiettorie tipiche
ricostruzione del traffico, e monitoraggio flotte**

Paolo Nesi

DISIT Lab chair, DINFO dept., University of Florence

<https://www.disit.org>, <https://www.snap4city.org>, paolo.nesi@unifi.it

Cell: +39-335-5668674



UNIVERSITÀ
DEGLI STUDI
FIRENZE

DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

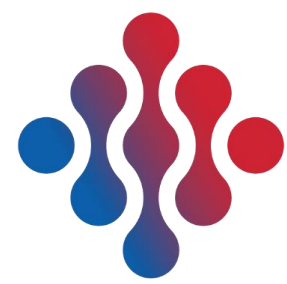
DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB



SNAP4CITY



FIWARE



ARTES ISAAC
Life Sciences & Healthcare Tech

Mobility and Trasport

No-Coding Platform to build Smart Applications

► Smart Ambulance:

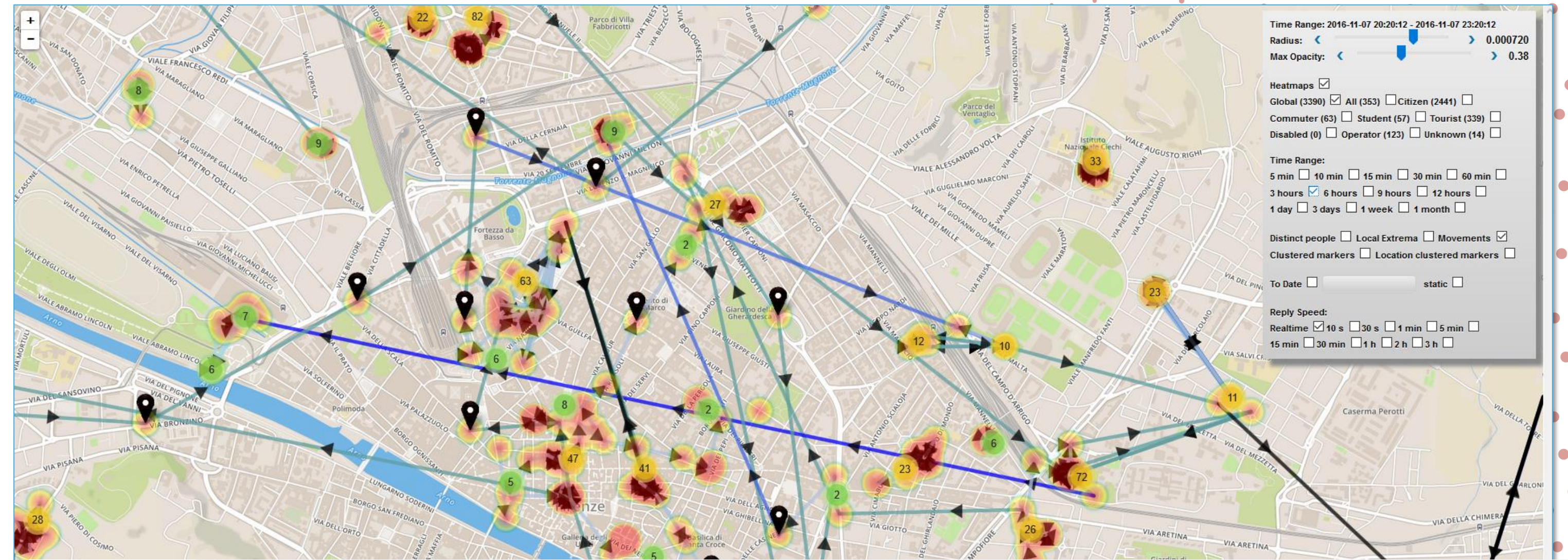
- Managing Vehicles with multiple IoT Devices on board
- Routing, Tracking, Logistic
- Connected Drive

► Sii-Mobility, Snap4City, Resolute

- Traffic Flow Reconstruction
- Routing, Multimodal Routing
- OD matrices
- User Behaviour Analysis
- Prediction of traffic, parking,
- IoT management

► Trafair

- Prediction of Pollutant



Traffic Flow Manager on multip

- ▲ Traffic Sensors
- ▲ Weather_sensor
- ▲ AirTemperatureAverage2HourFlorence
- ▲ PM2.5 Heatmap
- ▲ GRAL Heatmap
- ▲ Gral HRES
- ▲ Accident Heatmap
- ▲ Traffic Flow
- ▲ TFM FIRENZE Real Time
- ▲ TFM FIPILI Real Time
- ▲ TFM Pisa Real Time
- ▲ TFM Livorno Real Time
- ▲ TFM Modena Real Time
- ▲ TFM Santiago Real Time



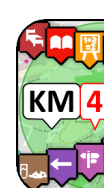
UNIVERSITÀ
DEGLI STUDI
FIRENZE

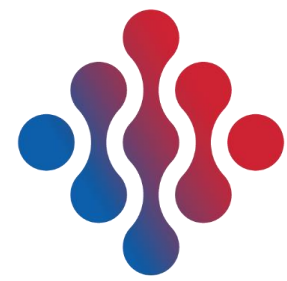
DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB



SNAP4CITY





ARTES ISAAC
Life Sciences & Healthcare Tech

Snap4City is a Collaborative **No-Coding Platform to build Smart Applications (IoT devices)**



Powered by
FIWARE

SNAP4
Appliances and Dockers
Installations

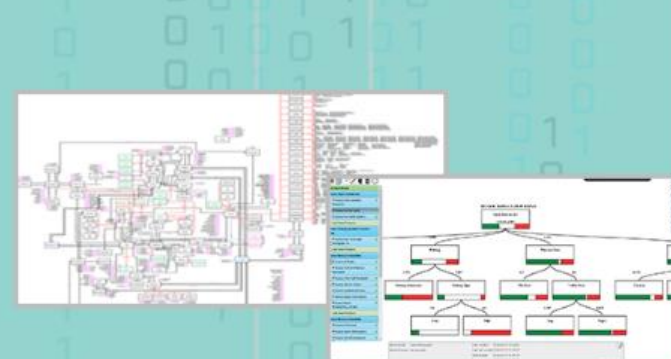
**FREE
TRIAL**

✓ **PEN Test
Passed**

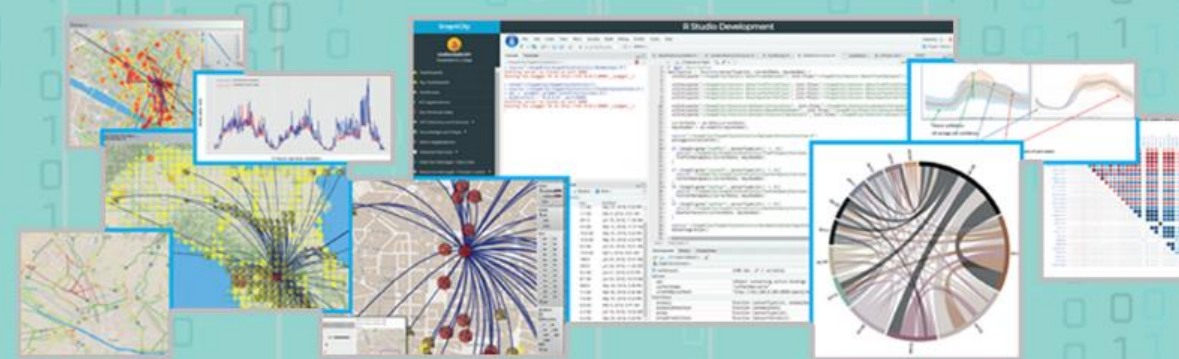
✓ **EU GDPR
COMPLIANT**



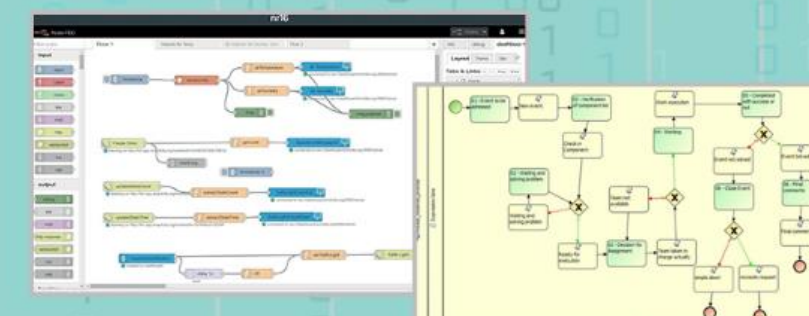
DASHBOARDS AND APPS - CONTROL ROOMS - DECISION SUPPORT SYSTEMS - WHAT-IF ANALYSIS



**EXPERT SYSTEM
KNOWLEDGE BASE
STORAGE**



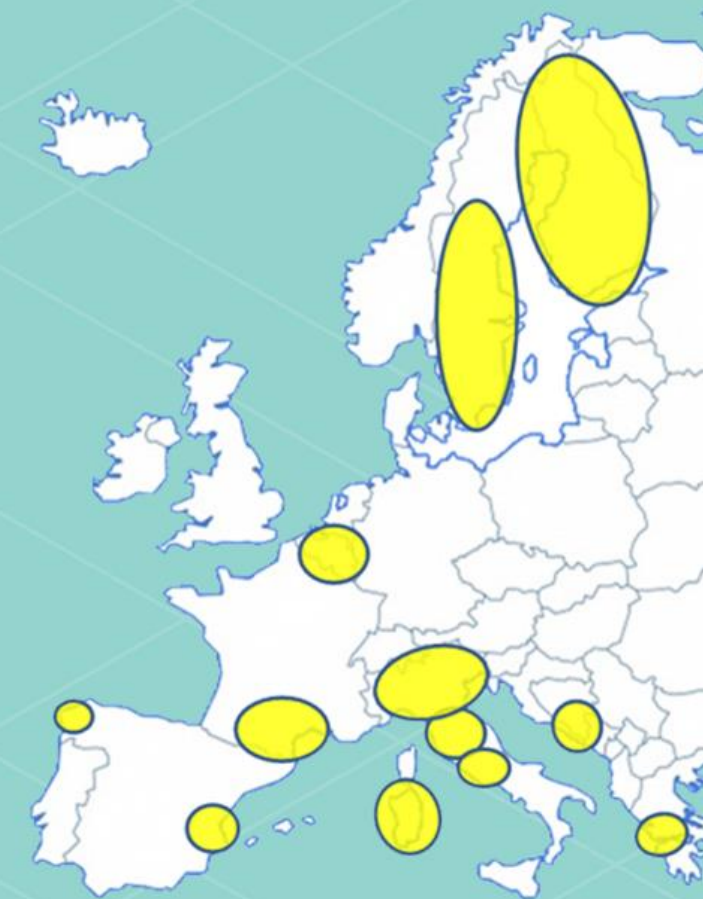
**BIG DATA ANALYTICS
ARTIFICIAL INTELLIGENCE
BUSINESS INTELLIGENCE
MACHINE LEARNING**



**DATA FLOWS, WORKFLOWS
MICROSERVICES
MANAGEMENT**

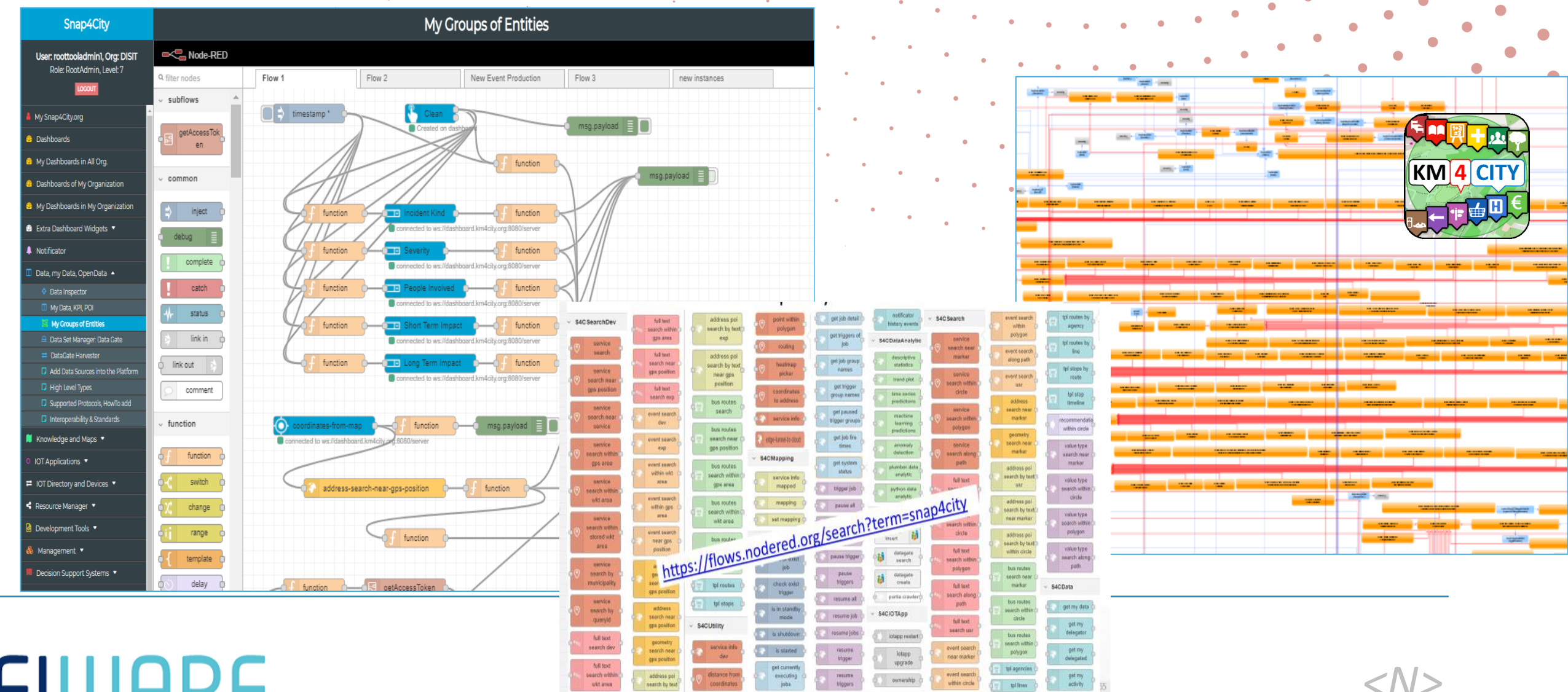
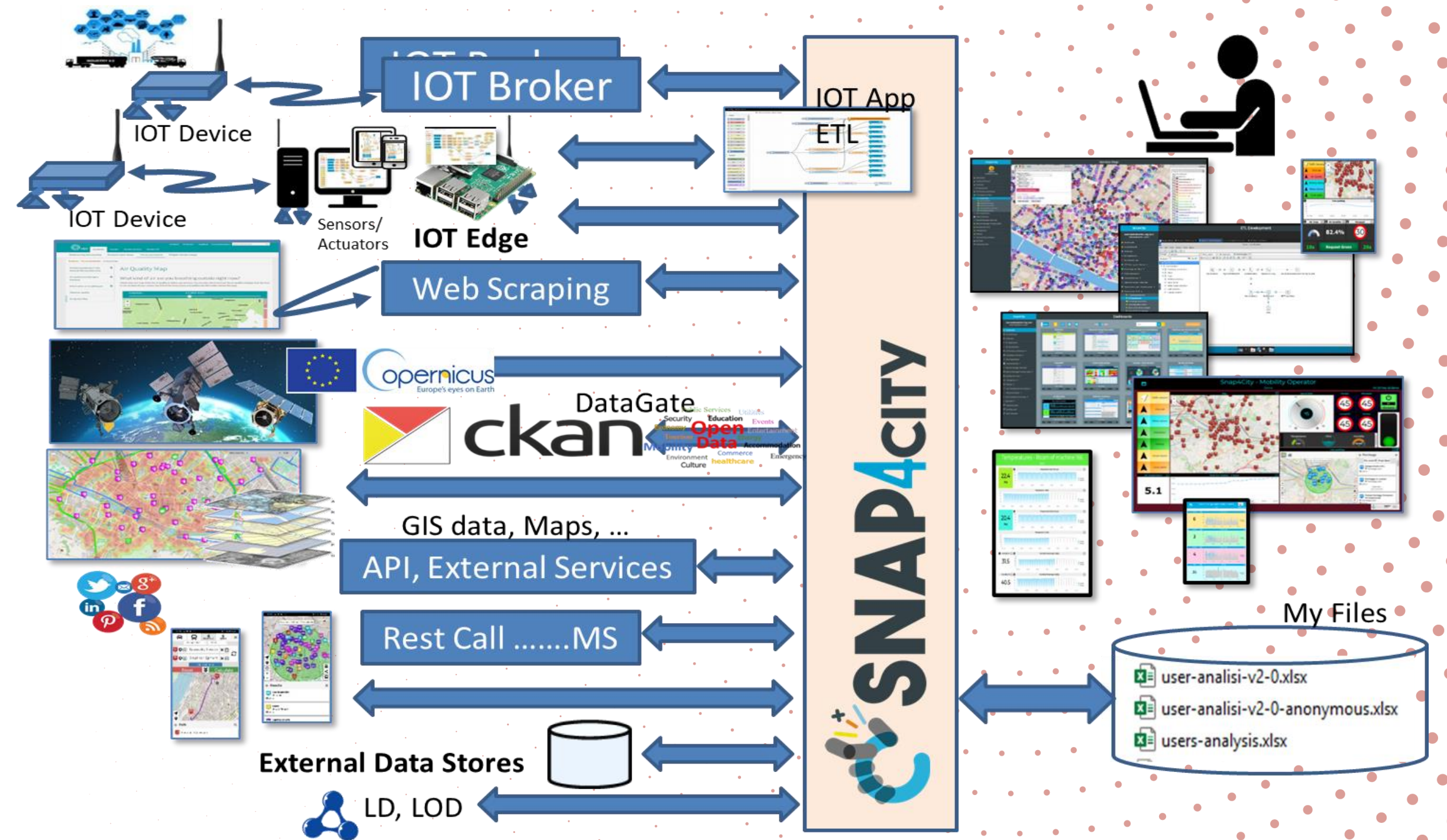


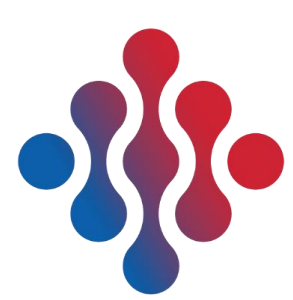
**METHODOLOGIES
COURSES AND COMMUNITY
LIVING LABS
DEVELOPMENT TOOLS**



Snap4City: Platform Purpose

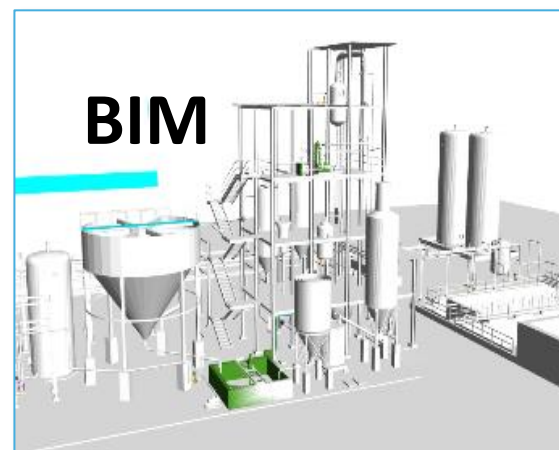
- ▶ **interoperability** processes, data communication protocols, standards,
 - ▶ Data **aggregation, transformation and integration**
 - ▶ **Snap4City Library on Node-RED**
 - ▶ More than 100 protocols and any formats
- ▶ **access control:**
 - ▶ **Snap4City:** GDPR Compliant, PENTest passed
- ▶ **semantic normalization:**
 - ▶ **Km4City ontology:** Knowledge Base, expert system
 - ▶ Based on Virtuoso
- ▶ **data management and analysis:** multi-modal big data, data analytics and AI-based algorithms
 - ▶ **Visual Analytics/Dashboards:** **Snap4City**
 - ▶ **Business Intelligence:** **Snap4City**
 - ▶ **Data Analytics:** Rstudio, Python, Keras, TensorFlow,
 - ▶ **DataDriven/Stream, RT:** Node-RED, broker based, WebSocket, End-to-end secure, FIWARE Platform
 - ▶ **Big Data storage:** Elastic Search, Kibana





ARTES ISAAC
Life Sciences & Healthcare Tech

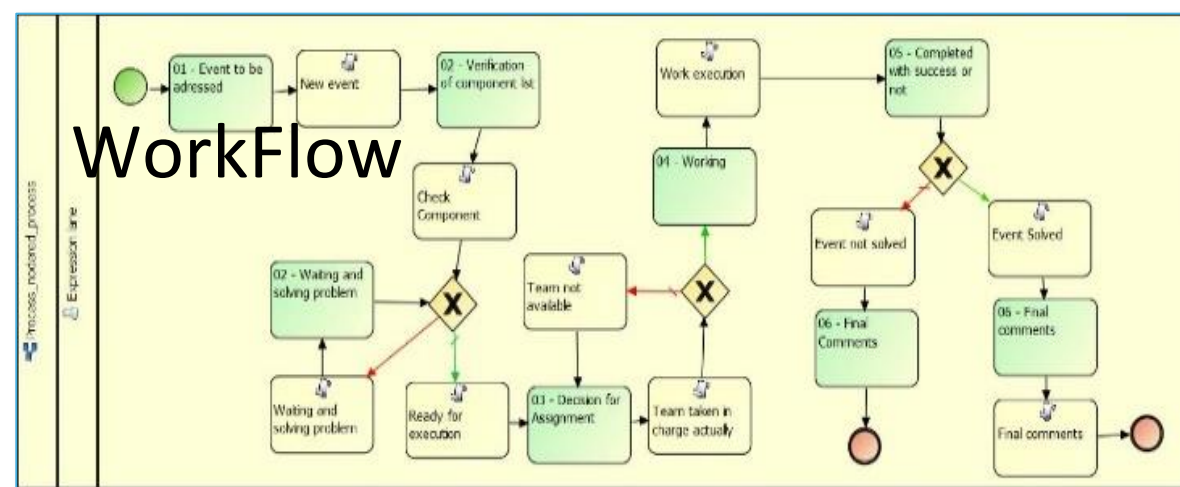
Snap4City Platform Concepts



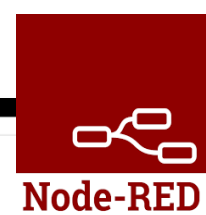
KPI, POI, MyKPI, ...

API, External Services

Web Scraping



Data Flows



IOT Apps



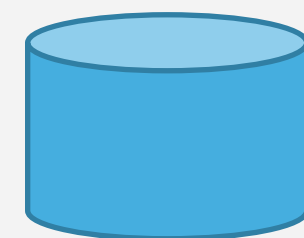
Data Analytics,
Artificial Intelligence



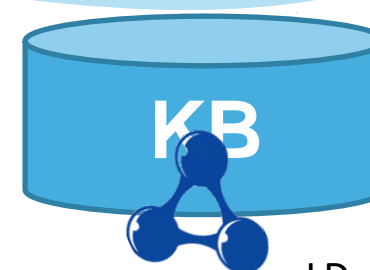
Dashboards and Apps

IOT Brokers

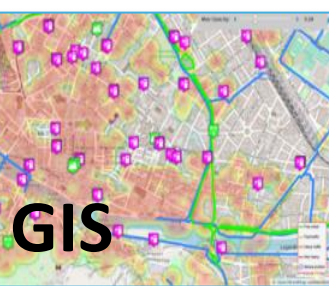
IOT Broker
IOT Broker



Big Data



LD, LOD



GIS



UNIVERSITÀ
DEGLI STUDI
FIRENZE

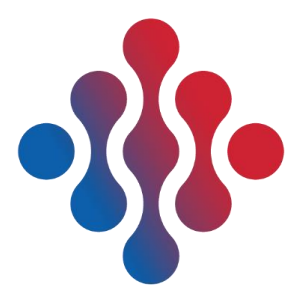
DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB



SNAP4CITY

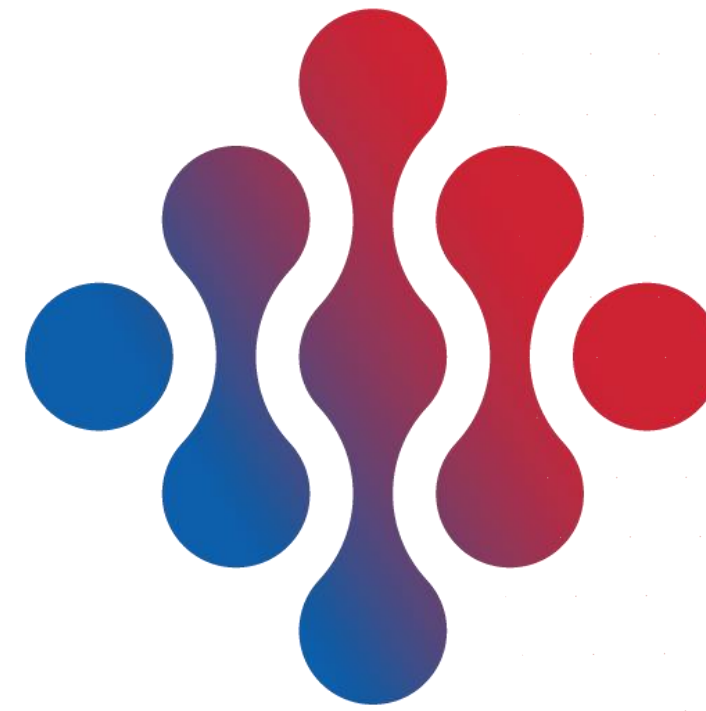




Conclusions on Snap4City

- ▶ **Type of POC: Platform**
- ▶ **TRL: 8**
- ▶ **Projects (solutions) which are using (have adopted) the platform:**
 - ▶ SmartAmbulance, RESOLUTE, etc.
 - ▶ Sii-Mobility, REPLICATE, Trafair, Mobimart, PC4City, Herit-data,
- ▶ **Next Steps**
 - ▶ Continuous improvement of system capabilities in the health domain
 - New Version of the Reasoner for dashboard composition
 - Making simpler and faster the applications production
 - Improving Ontology
 - ▶ What-IF analysis
 - ▶ NGSI-LD FIWARE
- ▶ **How to go further**
 - ▶ Specific domain trials are very important to improve the coverage and capabilities
 - ▶ Scaled up with larger trials in terms of users and device kinds





ARTES ISAAC
Life Sciences & Healthcare Tech

Mobility and Transport:

**Tracking veicoli, costruzione di matrici origine destinazione, traiettorie tipiche
ricostruzione del traffico, e monitoraggio flotte**

Paolo Nesi

DISIT Lab chair, DINFO dept., University of Florence

<https://www.disit.org>, <https://www.snap4city.org>, paolo.nesi@unifi.it

Cell: +39-335-5668674



UNIVERSITÀ
DEGLI STUDI
FIRENZE

DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB



SNAP4CITY



FIWARE