

# Km4City: Smart City Ontology and Tools for City Knowledge Exploitation

<http://www.disit.org/km4city>

**DIST** Distributed Systems and Internet Technologies Lab  
 Distributed Data Intelligence and Technologies Lab  
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<http://www.disit.dinfo.unifi.it>

UNIVERSITÀ DEGLI STUDI FIRENZE  
 DINFO DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE



- Transport systems  
Mobility, parking
- Public Services  
Govern, events,
- Sensors, IOT  
Cameras, ..
- Environment,  
Water, energy
- Shops, services,  
operators
- Social Media  
WiFi, network

Static, Slow and Real Time data flows

### Smart City Engine

**Data Ingestion Manager**

**Data Enrichment Manager**

**NoSQL DB Big Data**

- RDF Store
- Hbase, Hadoop
- Cloud based
- Scheduling
- ETL, Java, Gate, MapReduce,

- Km4City RDF Store validation
- Data Quality improvement
- Data harvesting, aggregation, mapping, reconciliation
- Natural Language Processing
- Data Mining ...

### RDF Indexing Manager

### Development Tools

- Service Map Query Generator  
<http://servicemap.disit.org>
- Linked Open Graph  
<http://log.disit.org>
- Km4City Ontology & API
- Documentation and Tutorial
- Open Source

### User Profiling and Suggestions on Demand

- Accommodation
- Advertising
- Agriculture And Livestock
- Civil And Edil Engineering
- Cultural Activity
- Education And Research
- Emergency
- Entertainment
- Environment
- Financial Service
- Government Office
- Health Care
- Industry And Manufacturing
- Mining And Quarrying
- Shopping And Service
- Tourism Service
- Transfer Service And Renting
- Utilities And Supply
- Wholesale
- Wine And Food

### Data:

**Static/quasi-static**

- Road Graph (Tuscany region)
  - 132,923 Roads
  - 389,711 Road Elements
  - 318,160 Road Nodes
- 1,508,207 Street Numbers
- 110,374 Services (20 cat, 512 cat.)
- 2,326 Bus stops & 86 bus lines
- 210 Parking areas
- 424 Traffic Sensors
- Info on: points, paths, areas, etc.

**Dynamic/real-time**

- bus lines: 200 updates/day per line
- Parking status: 36 updates/day
- Traffic Sensors: 48 updates/day
- Weather: 2 updates/day for 285 areas
- Events: 60 new events/day
- Wi-Fi: 250.000 measures per day

### Adopted By:

- **Firenze as Smart City engine**
- **Sii-Mobility, Smart City National Project**
  - <http://www.sii-mobility.org>
- **RESOLUTE H2020 EC Project**
  - Resilience of City Transport System, DRS14
  - <http://www.resolute-eu.org>
- **REPLICATE H2020 EC Project**
  - Smart City Lighthouse, SCC1



Km4City Smart City API

Tools for Administrators and Operators

End users

### Smart City Dashboard

<http://www.disit.org/dash>

### Smart Decision Support

<http://Smartds.disit.org>

### Service map browser

<http://servicemap.disit.org>

### Twitter Vigilance

<http://www.disit.org/tv>

### Origin Destination Matrix

<http://www.disit.org/odsf>

### Mobile e Web Apps

<http://www.km4city.org>