

Smart City Strategic Forecast

Smart City 360, Bratislava



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Posed issue

- *Quoting “convergence of scientific community and industry in supporting efficient technology transfer in the area”.*
- Establishing collaboration among city stakeholders (Public Administrator, City Operators, Citizens, civil protection)
 - Community of Users/Stakeholders: workshops
 - Listen of Citizens: workshops, associations, blog Vigilance, Twitter Vigilance





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FIRENZE



DISIT Lab, Distributed Data Intelligence and Technologies
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Department of Information Engineering (DINFO)
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Lesson Learned

- Taking into account results of participatory actions
- Smart city strategic plan, city agenda: prioritizing interventions
- Agreements for collaborations with main actors:
 - main research centers, main City Operators, etc.
- Direct collaborations on specific projects on:
 - ICT, Mobility, Culture, Energy, etc.
 - Experimenting on specific projects of the Smart City Strategic Plan
- Needs of harmonizing results and aggregating data towards dashboards





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Km4City

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Transport systems
Mobility, parking



Public Services
Govern, events,



Sensors, IOT
Cameras, ..



Environment,
Water, energy



Shops, services,
operators



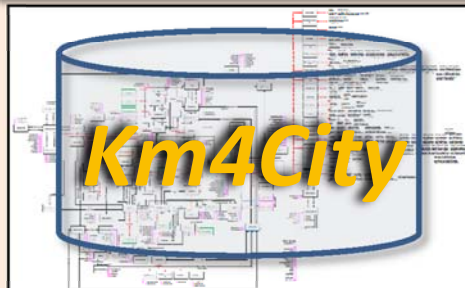
Social Media
WiFi, network



Static, Slow and Real Time data flows

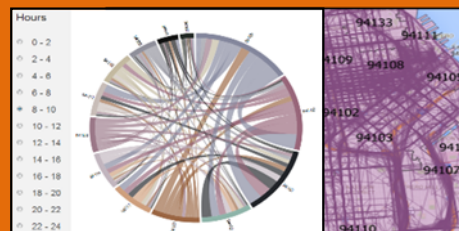
DISCES -- Distributed and parallel architecture on Cloud

Km4City Smart City Engine



User Profiling and Suggestions on Demand

Flow and Origin Destination Matrix
<http://www.disit.org/odsf>



Km4City Tools for Developers

Km4City Smart City API

Tools for Operators

Smart City Dashboard

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



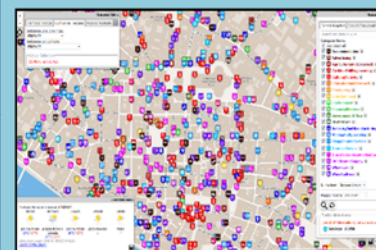
Smart Decision Support

<http://Smartds.disit.org>



Service map browser

<http://servicemap.disit.org>



Twitter Vigilance

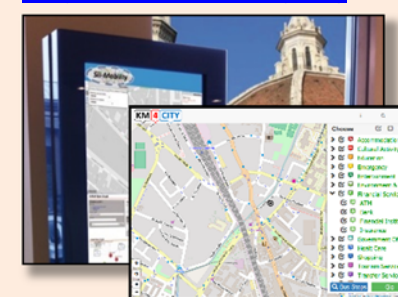
<http://www.disit.org/tv>



Tools for Final Users

Mobile e Web Apps

<http://www.km4city.org>



The Km4City Challenge

- Huge amount of data are produced from: Open Data, Linked Data, Real Time sensors, Twitter, etc.
 - Most of them are not semantically interoperable
- A common model is the only solution to provide services to Public Administrations, Citizens, City Operators (mobility, energy, telecom, etc.)
 - None of them may have the global view
 - Cities are not capable to sustain the creation of control rooms made by proprietary tools
 - A join venture is needed, huge competence are needed on a large range of solutions, from ICT, energy, mobility, risk assessment, resilience, etc.
- Cities are sociotechnical systems, non linear models are needed, several methods to assess and interact



Aggregated data

- data may produce more results than the simple add.
 - Enabling risk and resilience assessment
 - Offering Aggregated data as a service, API
 - Large companies (as city operators) may have back their data augmented with the data of others stakeholders, plus OD, etc.
 - Reduction of costs to make innovative services, facilitating the work for the SME
 - Exploiting inference, self correction, reasoning
 - reduction of time of adding new data in the integrated environment



Km4City Scenarios and adoptions

- **Km4City is adopted and running tool as**
 - Florence data aggregator, presented at FODD 2015, February
 - <http://servicemap.disit.org>, see mobile Apps, etc.
- **Km4City is adopted as a starting point in large projects up to 2020**
 - RESOLUTE H2020 DRS7 project of the EC
 - REPLICATE H2020 SCC1 project of the EC
 - Sii-Mobility Smart City National, MIUR



- Experimentations and validation in Tuscany
- Integration with present central station and subsystems

<http://www.Sii-Mobility.org>



ataf

tiemme

BUSITALIA

atam

CTT

- Autostrade
- SS Fi-Pi-Li
- SS Fi-Si
- Ferrovie (primarie)
- - Aree





H2020 RIA project

<http://www.resolute-eu.org>

- Develop European Resilience Management Guidelines (ERMG)
 - Develop a conceptual framework for creating/ maintaining Urban Transport Systems
- Enhance resilience through improved support of human decision making processes, particularly by training professionals and civil users on the ERMG and the RESOLUTE system
- Operationalize and validate the ERMG by implementing the RESOLUTE Collaborative Resilience Assessment and Management Support Systems (CRAMSS) for Urban Transport Systems addressing Road and Urban Rail Infrastructures
 - Pilots in Florence and Athens
 - Mobile app for specialists and common users, citizens
- Adoption of the ERMG at EU and Associated Countries level

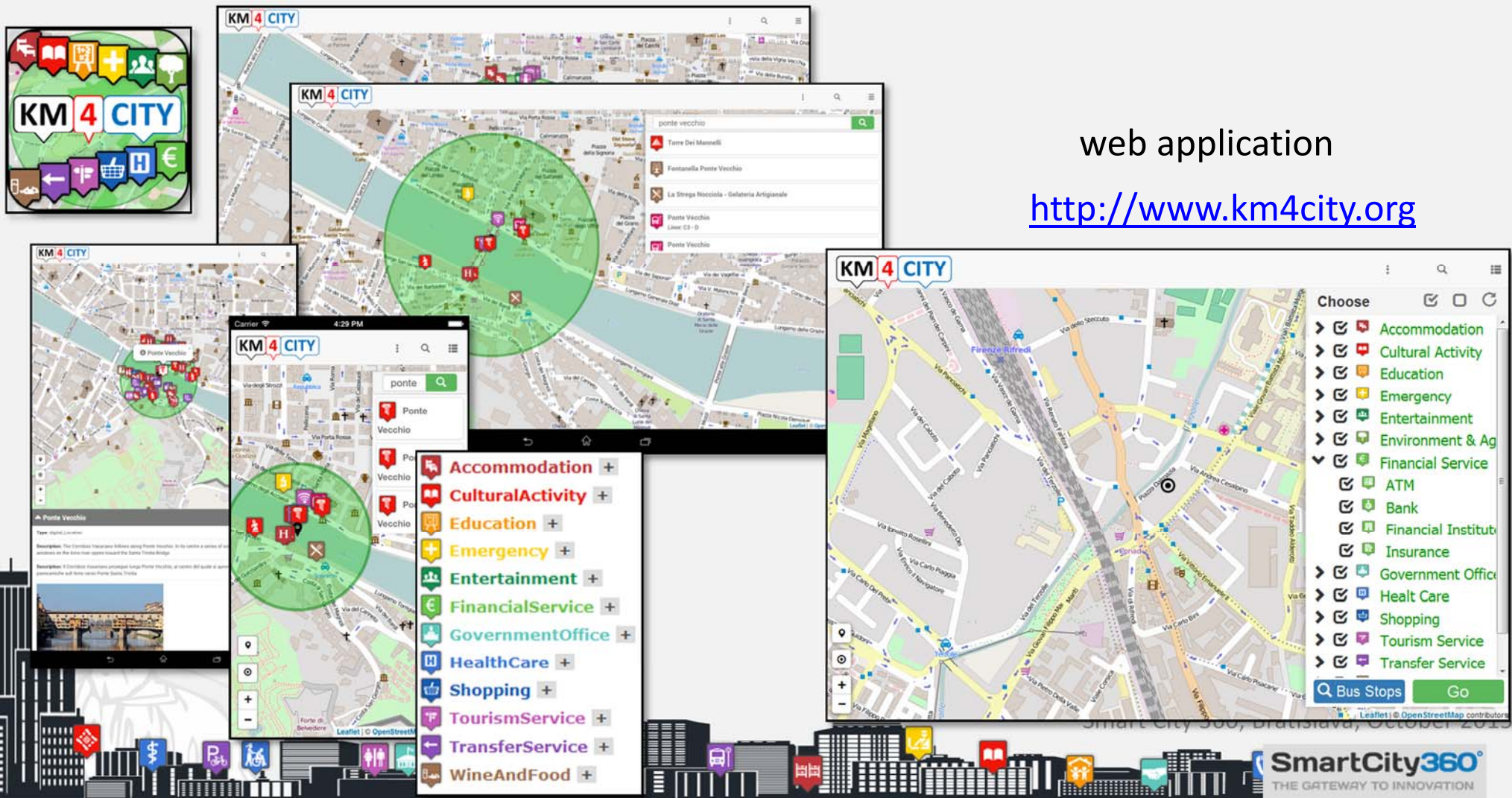


- *demonstrate Smart City technologies in energy, transport and ICT in districts in San Sebastian, Florence and Bristol, follower cities of Essen, Nilufer and Lausanne*
- *Cities are the customer: considering local specificities*
 - *Specific tools in the hands of the citizens*
- *Solutions must be replicable, interoperable and scalable.*
 - *Integrated Infrastructure: deployment of ICT architecture, from internet of things to applications*
 - *Low energy districts*
 - *Urban mobility: sustainable and smart urban services*

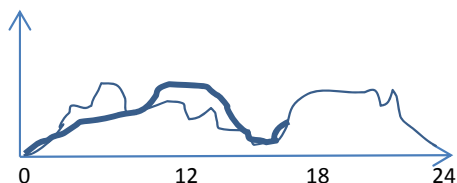


Km4City Mobile App all platforms

- >100.000 services, >500 subclasses,
- Users profiled, suggestions profiled, engagement profiled



Consumo WiFi



Posti Liberi in in hotel



Posti Liberi in Parcheggi in strada

5,2%

Posti Liberi in Parcheggi interrati

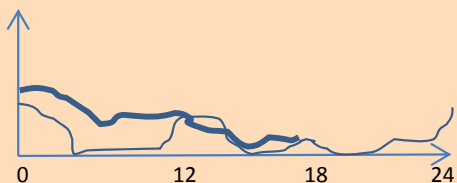
13,2%

Previsioni Meteo per il comune di FIRENZE:

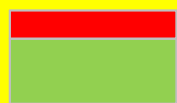
Lunedì	Martedì	Mercoledì	Giovedì	Venerdì
pioggia debole e schiarite 20°C / 24°C	pioggia debole 17°C / 22°C	pioggia debole e schiarite 15°C / 23°C	nuvoloso /	velato /

Ultimo Aggiornamento: 2015-10-05T09:40:00+02:00

Consumo Energia Colonne Comune



Percentual Bus Attivi rispetto al Plan



Processo Smart DS rest34



Processo Smart DS Fermata 45



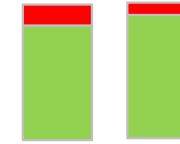
Numero Bike in Sharing del Comune

930

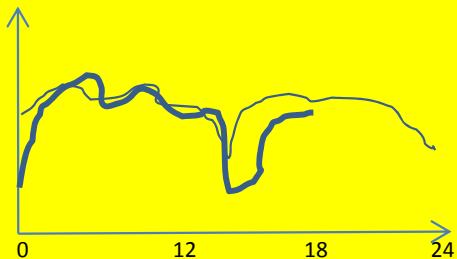
Numero Open Data del Comune

1230

Firenze WiFi UNIFI wiFi



Taxi Operativi



Eventi del giorno e prossimi eventi di rilievo

- Teatro Puccini: La Traviata
- Stadio: qualifiche provinciali
- Palazzo dei congressi: conferenza sulle malattie...
- 06-10-2015: Matteo Renzi a Firenze, salone dei 500
- 01-11-2015: UNIFI inizio anno accademico

Posizione in tempo reale degli Autobus <ATAF, Tramvia>



CPU	CPU Load	Mem Total	Mem Free	Cores	Jobs/h	Jobs Executed	Jobs Failed/Success (24 h)	Jobs Failed/Success (7 days)
63.45 GHz	45.57 GHz (71.83%)	70.41 GB	8.47 GB	24	433.17	75285	1361 (20.15%) 5395 (79.85%)	9043 (18.77%) 39141 (81.23%)

Servizi al Cittadino: 23456 adempimenti
Sensori di traffico: 85%

Principali Twitter Trends: #firenze #florence #fiorentina
Citazioni: @acffiorentina @nicolodidaria

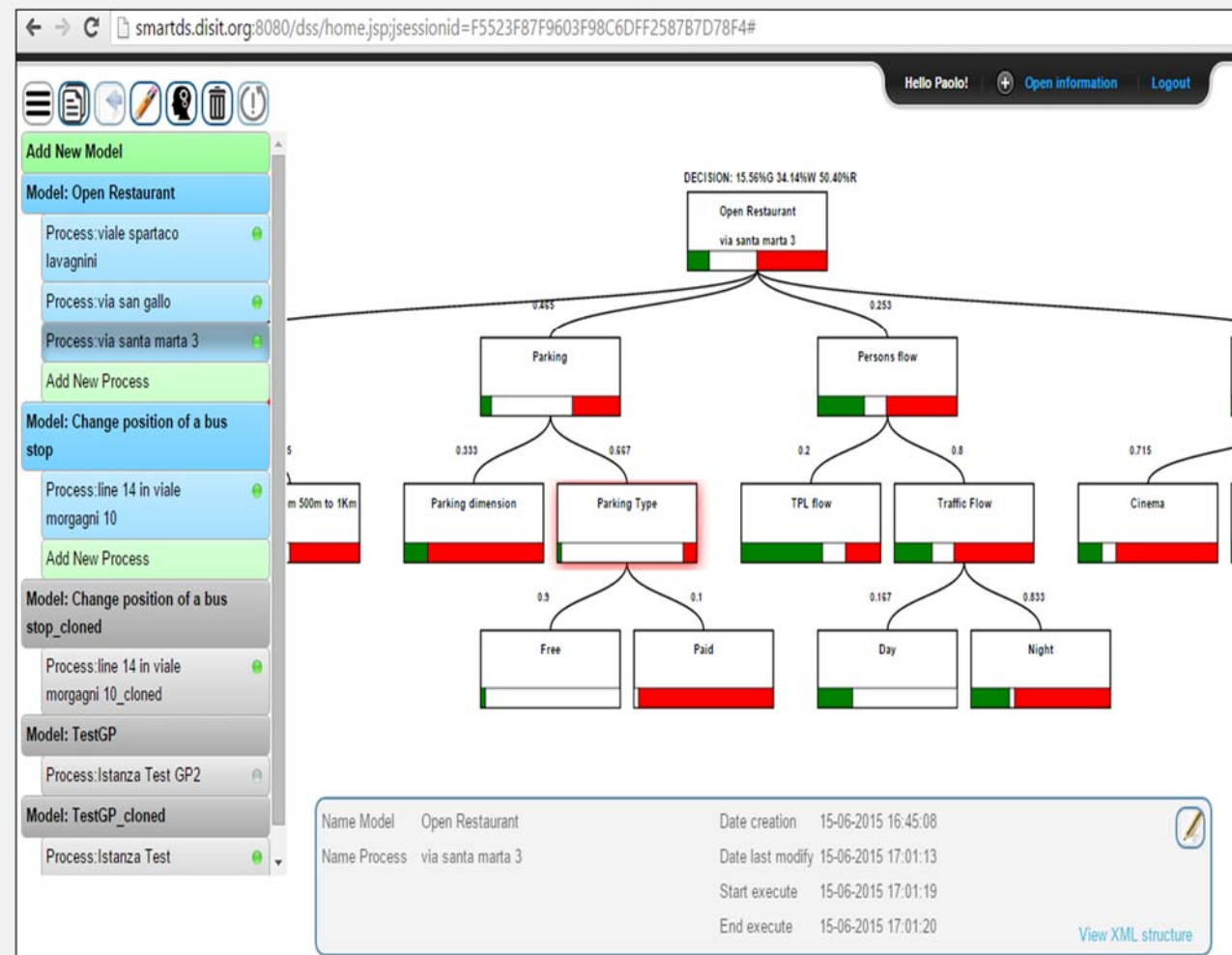
Smart City Decision Support

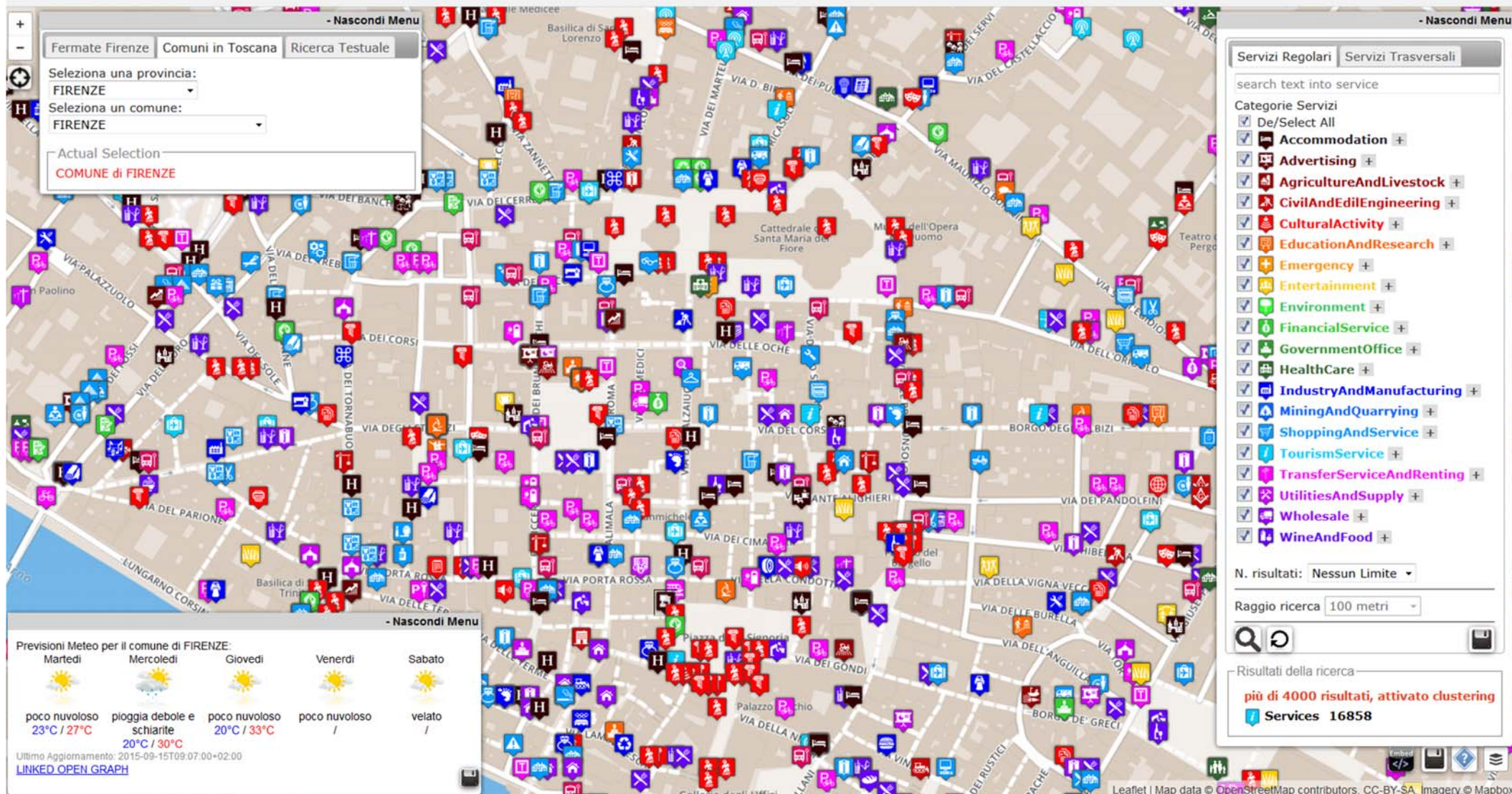
- <http://smartds.disit.org> (user paolo.nesi@unifi.it, password= prova)

- **System Thinking**, well known tool for Smart City decision support sys..

Plus:

- Collaborative work...
- reuse, copy past, ...
- Processes connected with RDF Store of the city via SPARQL queries
- Mathematical model for propagation of decision confidence..

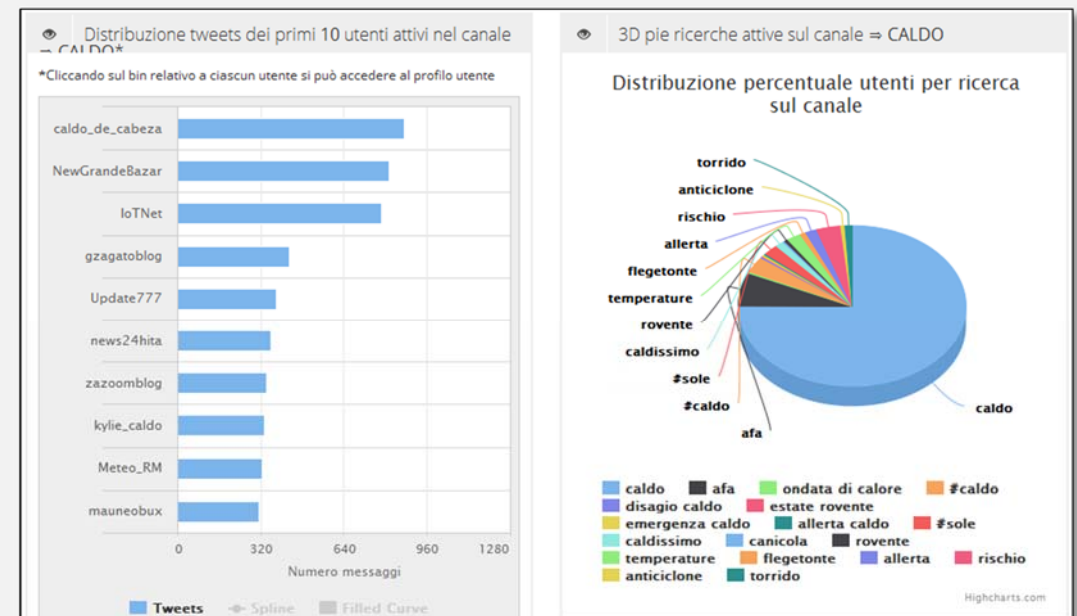
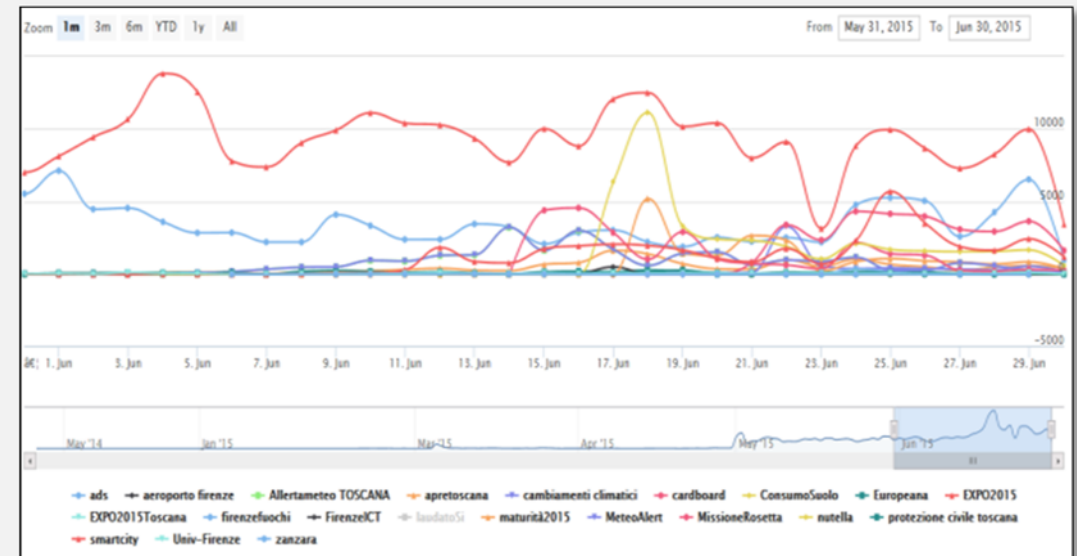




• Search in the area

Twitter Vigilance

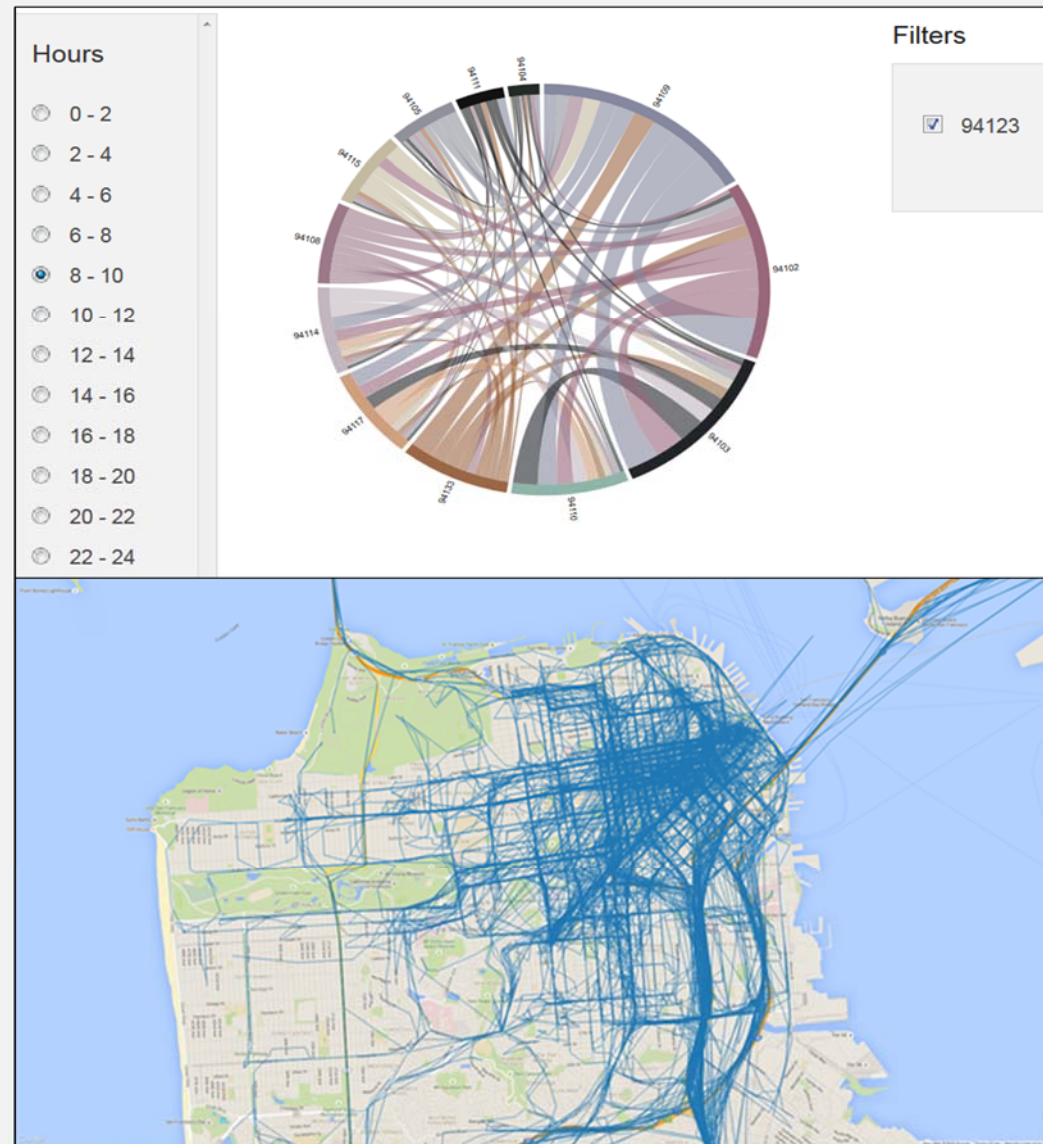
- <http://www.disit.org/tv>
- Citizens as sensors to assess
 - sentiment on services,
 - Response of consumers
 - Soundages,
 - etc.
- Identify, assess and quantify
 - Critical conditions,
 - Information channel
 - Opinion leaders
 - communities



Traffic and People Flow Assessment

<http://www.disit.org/6694>

- Several kind of sensors and mobiles, to assess the people and traffic flows
 - To improve services
 - To predict critical conditions on Crit.Infra.
 - To take real time decisions and sending messages in push to population
 - To Increase city resilience



The screenshot displays the Km4City application interface, which provides a comprehensive view of urban data in Florence. The main map area shows streets, landmarks, and various colored overlays representing different data layers. Several information panels are visible:

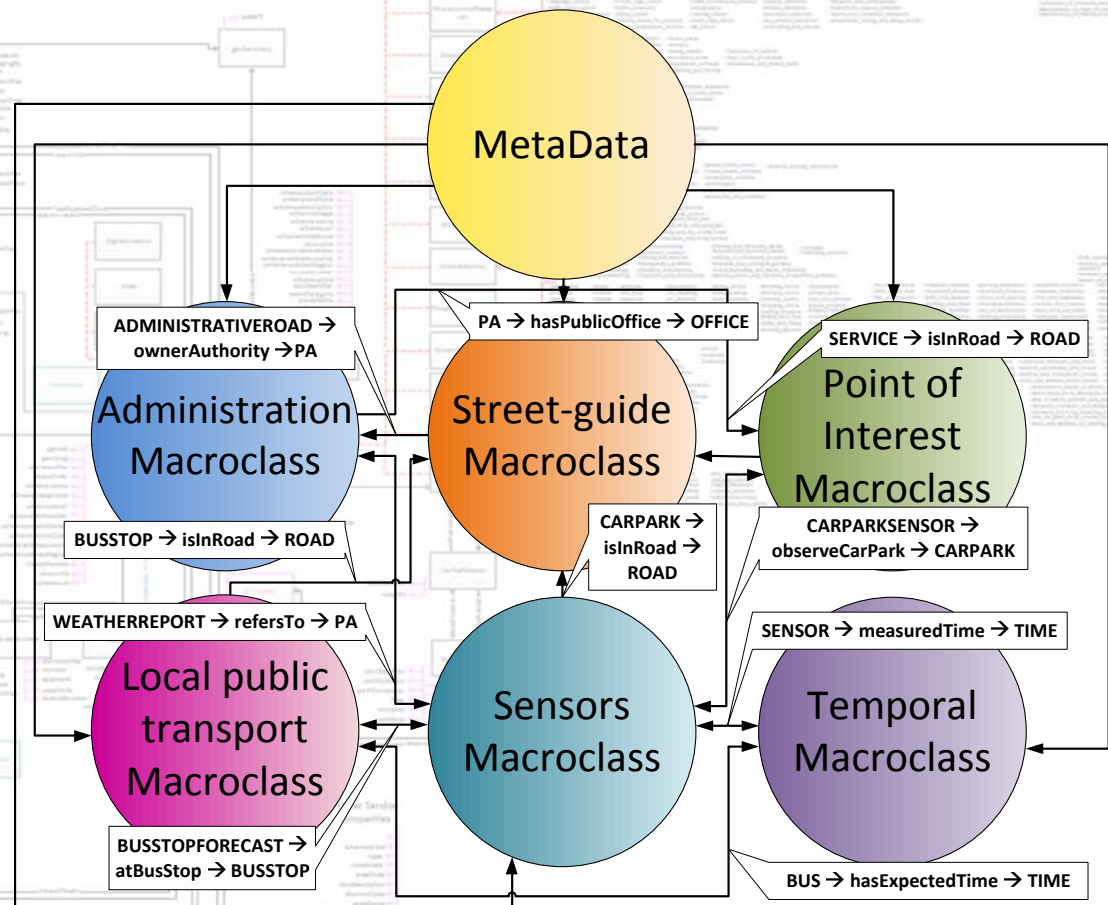
- Top Left Panel:** Contains search filters for "Fermate Firenze", "Comuni in Toscana", and "Ricerca Testuale". It also includes dropdown menus for selecting a province (FIRENZE) and a commune (FIRENZE), with an "Actual Selection" section showing "Servizio: PERGOLA".
- Top Center Panel (Giardino di piazza dell'Indipendenza):** Provides details for a specific location, including its type (Entertainment - Green_areas), digital location, address (PIAZZA DELLA INDIPENDENZA, 15), CAP (50129), city (FIRENZE), province (FI), and a note (areeverdi238). It includes a "Rimuovi dalla Mappa" button.
- Bottom Left Panel (Fermata: T1 ALAMANNI):** Shows bus lines (2, 28, 52, 54) and a note that real-time data is not available.
- Bottom Center Panel (Fermata: PERGOLA):** Displays bus lines (14, 19, 23, 31, 6) and a route table for line 6A and 6B, showing the path between NOVELLI and OSPEDALE TORRE GALLI.
- Bottom Right Panel (Previsioni Meteo):** Provides weather forecasts for the next five days (Martedì to Sabato) for the commune of FIRENZE, including temperature ranges and weather conditions.
- Right Panel (Servizi Regolari):** Offers a search text input, a list of service categories (e.g., DigitalLocation, Fresh Place, Road Sensors, Bus Stops), and a search radius selector.

The map itself is a detailed street map of Florence, with various colored overlays representing different data layers. The interface is designed to be user-friendly and informative, providing a wealth of data for urban planning and management.

- **Areas, Bus lines, bike lanes, tram, RTZ, etc.**

Smart-city Ontology

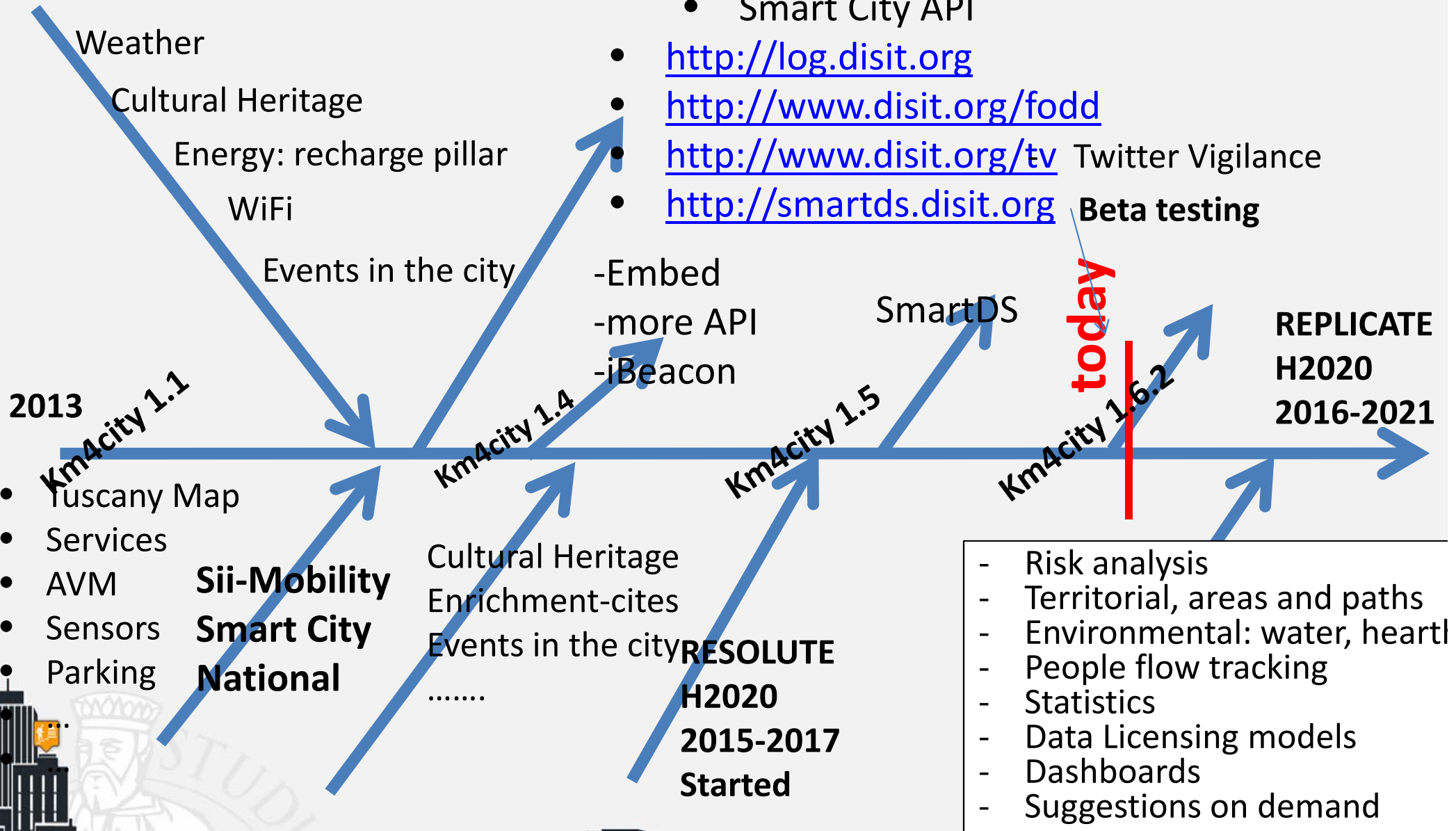
- The data model provided have been mapped into the ontology, it covers different aspects:
 - Administration
 - Street-Guide
 - Points of interest
 - Citations from strings
 - Local public transport
 - Sensors..
 - Energy
 - Temporal aspects
 - Metadata on the data
 - Statistics
 - Risk assessment





Km4City roadmap

- <http://servicemap.disit.org>
 - Smart City API
- <http://log.disit.org>
- <http://www.disit.org/fodd>
- <http://www.disit.org/tv> Twitter Vigilance
- <http://smartds.disit.org> **Beta testing**



Km4City EcoSystem

- **Final Users tools:** <http://www.disit.org/km4city>
 - Km4City mobile applications: all platforms
 - Km4City web application: <http://www.km4city.org>
- **Public administrator tools:**
 - Smart City Dashboards
 - ServiceMap Server, <http://servicemap.disit.org>
 - Smart decision support system, <http://smartds.disit.org>
 - Twitter Vigilance, <http://www.disit.org/tv>
- **Developers tools:**
 - ServiceMap Server, plus API, <http://servicemap.disit.org>
 - Ontology Documentation <http://www.disit.org/km4city>
 - LOG LOD browser <http://log.disit.org>
 - Open Source Mobile Application, FODD: <http://www.disit.org/6595>
- **Back Office tools for Public Administrations**
 - Data Ingestion Manager, DIM, <http://www.disit.org/6732>
 - Smart City Engine, SCE, the smart scheduled processes <http://www.disit.org/6515>
 - RDF Indexer Manager, RIM, <http://www.disit.org/6708>
 - RDF store enricher with dbPedia
- **Adopted on projects and real scenarios**
 - Sii-Mobility, RESOLUTE H2020 and REPLICATE H2020

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