



UNIVERSITÀ
DEGLI STUDI
FIRENZE

DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB



MINISTERO DELL'ISTRUZIONE DELL'UNIVERSITÀ E DELLA RICERCA



Dai Dati Intelligenti ai Servizi

Smart City API Hackathon

7-8 Aprile 2017



<http://www.sii-mobility.org>

Paolo Nesi, km4city@disit.org

<http://www.Km4City.org>

[Questions to be sent at km4city@disit.org](mailto:km4city@disit.org)





Agenda 7 Aprile



- Overview progetto Sii-Mobility
- Presentazione del modello dati
- Come funziona l'hackathon
- Ingaggiare gli utenti con le App
- Scenari di uso ? (Nesi)
- Development tool, Info e documentazione (Paolucci)
- Presentazione delle smart city API (P. Bellini)
- Sviluppo di Moduli per App "Toscana dove cosa"



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<http://www.disit.org>

Partner di progetto

- [ECM S.p.A. \(referente istruttorio\)](#)
- **Università degli Studi di Firenze, DINFO.DISITlab (Coordinatore) <http://www.disit.org> :**
 - [UNIFI.DISIT Lab, Distributed Systems e Internet Technologies, Dip.di Ingegneria dell'Informazione \(DINFO\) \(coordinatore\)](#)
 - [UNIFI.GOL, Global Optimization Lab "Gerardo Poggiali" \(DINFO\)](#)
 - [UNIFI.LART, Laboratorio Reti e Telecomunicazioni \(DINFO\)](#)
 - [UNIFI LSTT, Laboratorio di Sistemi Telematici e di Telerilevamento \(DINFO\)](#)
 - [UNIFI.MDM, Sezione Meccanica Applicata, Dip. di Ingegneria Industriale \(DIND\)](#)
 - [UNIFI.CSL, Communication Strategy Lab, Dip. di Scienze Politiche e Sociali \(DSPS\)](#)
- [Swarco Mizar S.p.A.](#)
- [Geoin S.r.l.](#)
- [QuestIT S.r.l.](#)
- [Inventi In20 S.r.l.](#)
- [Softec S.p.A.](#)
- [T.I.M.E. S.r.l.](#)
- [Liberologico S.r.l.](#)
- [MIDRA – Multidisciplinary Institute for Development Research and Applications](#)
- [ATAF S.p.A.](#)
- [Busitalia-Sita Nord S.r.l.](#)
- [A.T.A.M. S.p.A.](#)
- [CTT Nord S.r.l.](#)
- [TIEMME S.p.A.](#)
- [EWings S.r.l.](#)
- [Argos Engineering S.r.l.](#)
- [Elfi S.r.l.](#)
- [Calamai & Agresti S.r.l.](#)
- [Project S.r.l.](#)
- [Effective Knowledge S.r.l.](#)
- [Negentis S.r.l.](#)



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Patrocinatori



Città Metropolitana
di Cagliari



ataf



EPSON
EXCEED YOUR VISION



NiviGreen



FONDAZIONE
CR FIRENZE

DITECFER
DISTRICT FOR RAIL TECHNOLOGIES
HIGH SPEED SAFETY & SECURITY



EUROSPORTELLI.EU



Fondazione per la ricerca
e l'innovazione

Consorzio
GARR



PIN

POLO UNIVERSITARIO
CITTÀ DI PRATO



DISI



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Sii-Mobility Overview





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Sii-Mobility



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Commenti dei cittadini,
Social Media



AVM trasporto
Pubblico

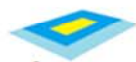
Merci



Sensori su
trasporto Privato



Sensori
Parcheggi



Monitoraggio
traffico, autostrade



Rete
Ferroviaria



Parametri
ambientali



Servizi ed
enti



Ordinanze: eventi,
lavori pubblici, .



Emergenze,
polizia, 118



Sensori,
sistema monitoraggio



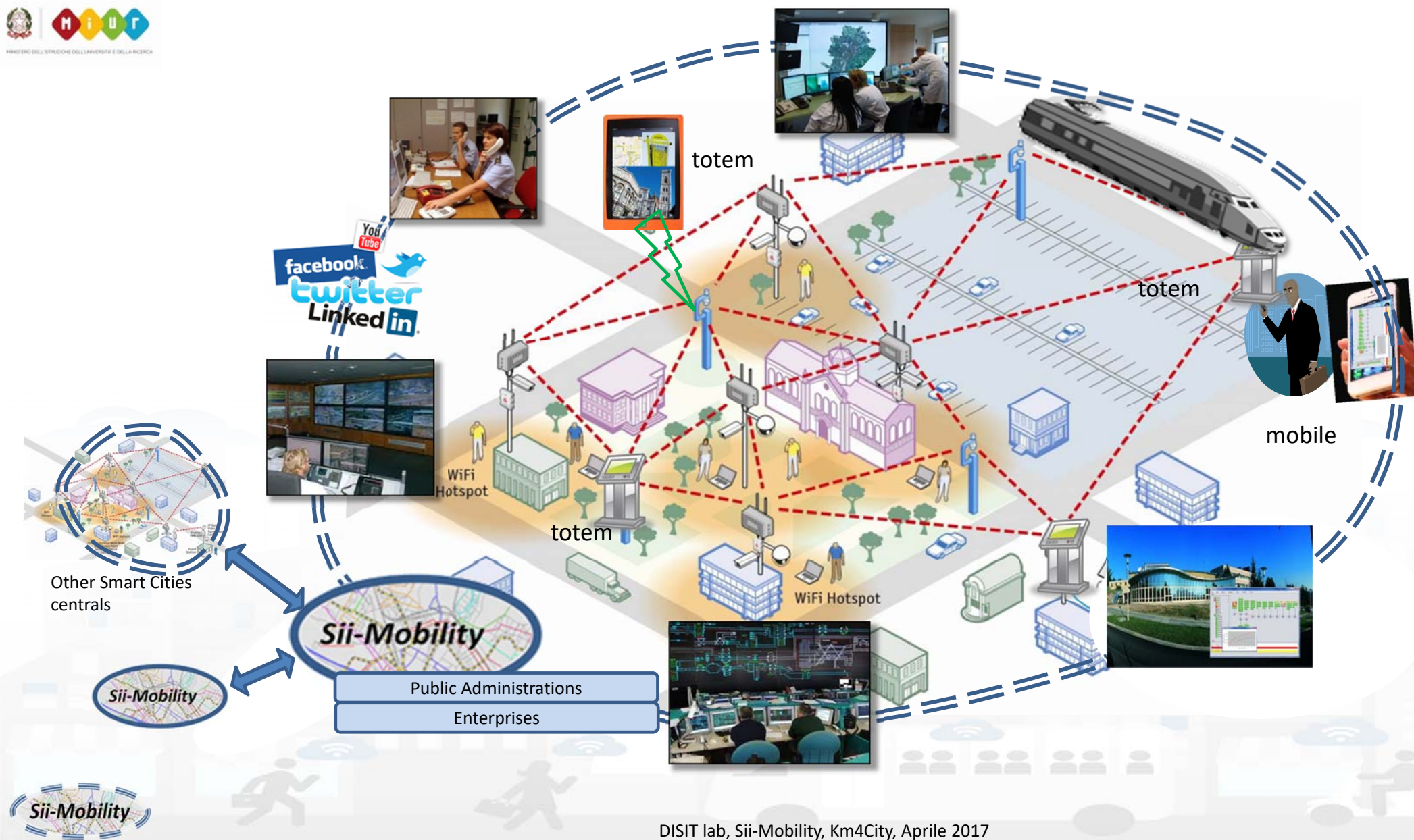
UTC



Infomobility



Varchi
Telematici, ZTL

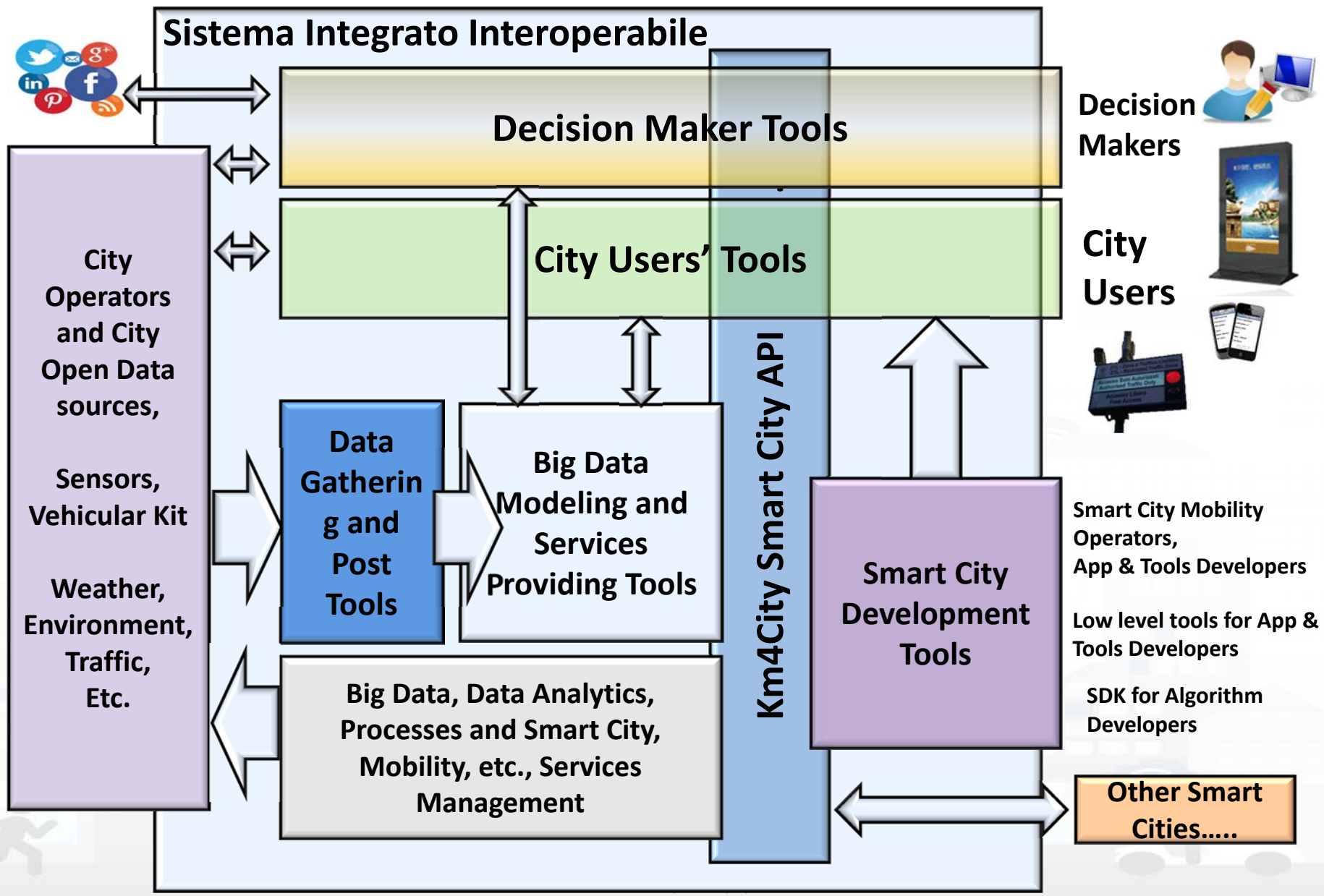




General Objectives



- Reduce the social costs of mobility
 - minor inconvenience,
 - greater efficiency,
 - greater sensitivity to the needs of the citizen,
 - lower emissions,
 - better environmental conditions;
 - info-training programs to help city user in getting virtuous habits;
 - reduce transportation costs and travel times for users, for operators and administrations,
 - optimization solutions.
- **Testing on municipalities and provinces of Tuscany**
- **Contribute to the improvement of national and international standards**
- **simplify the use of mobility systems**
 - innovative sensors for AVM and private transport on the territory
 - integrated systems for payment and identification
 - driving / offline routing solutions
 - connect the drive, smart drive or walk
 - Integration of data from operators and different type sources
 - advanced management of resources measurement of flows realization of sensors, actuators



Parking sensors



Transport systems
Mobility, parking



Public Services
Govern, events, ...



Sensors, IOT
Cameras, ..



Environment,
Water, energy



Shops, services,
operators



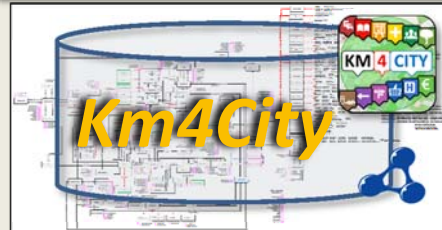
Social Media
WiFi, network



Static, Slow and Real Time data flows

DISCES -- Distributed and parallel architecture on Cloud

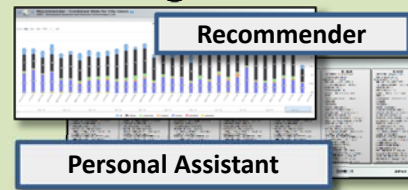
Sii: Smart City Engine



Big Data Analytics



Smartening Tools



Development Tools



Smart City API

City Operators and Decision Makers

Dashboards



Smart Decision Support



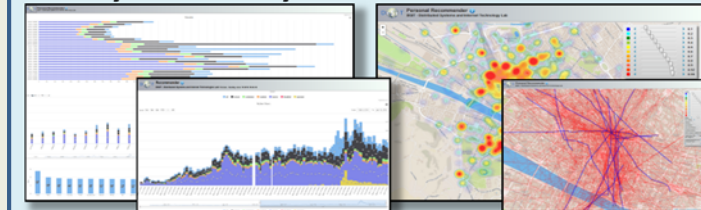
ServiceMap browser



Twitter Vigilance



Analyzers of City User Behavior



Tools for Final Users

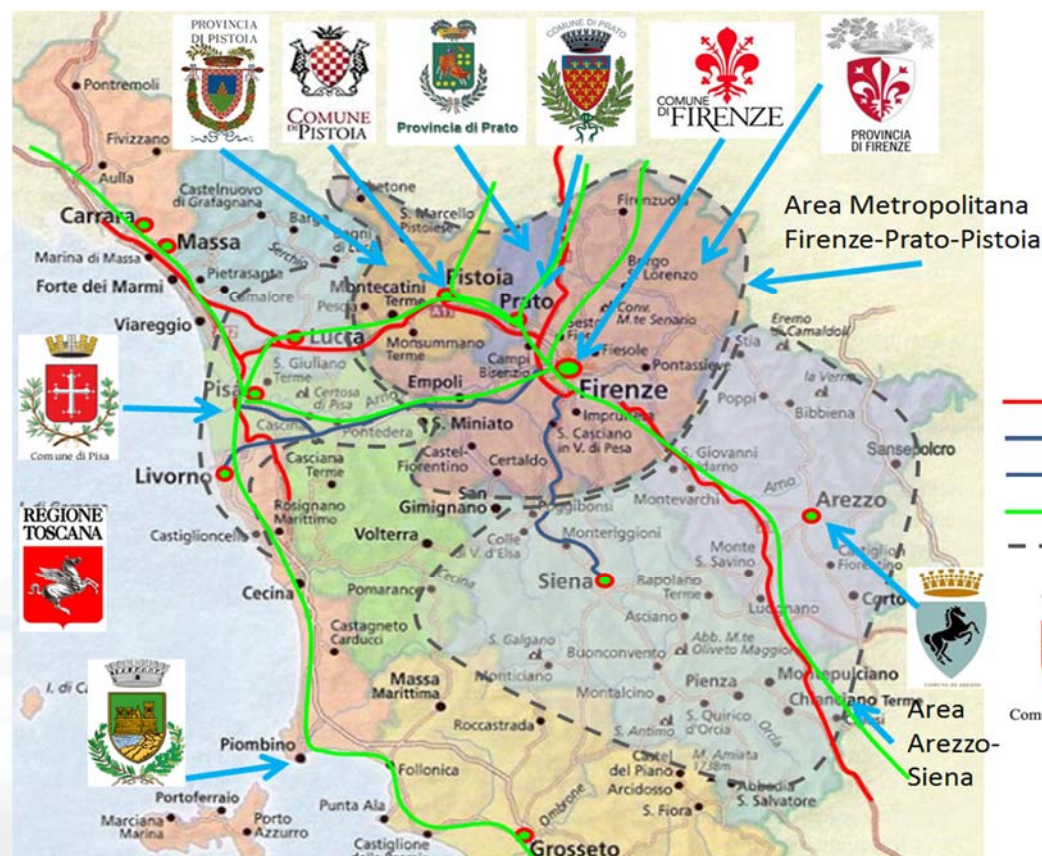
Mobile e Web Apps



[Http://www.km4city.org](http://www.km4city.org)

- Experimentations and validation in Tuscany
- Integration with present central station and subsystems
- DISIT lab, Università di Firenze, is the tech-scientific coordinator

■ <http://www.Sii-Mobility.org>



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

ECM; Swarco Mizar;
Inventi In20; Geoin;
QuestIT; Softec; T.I.M.E.;
LiberoLogico; MIDRA
(autostrade, motorola);
ATAF; Tiemme; CTT
Nord; BUSITALIA;
A.T.A.M.; Effective
Knowledge; eWings;
Argos Engineering; Elfi;
Calamai & Agresti;
Project; Negentis

Principali Delibere su Sii-Mobility



PA	Tipo di atto
Provincia di Prato	Delibera di Giunta n.267 del 30.10.2012
Comune di Prato	Delibera di Giunta n.474 del 30.10.2012
Provincia di Firenze	Delibera di Giunta n.147 del 06.11.2012
Comune di Firenze	Delibera di Giunta n.403 del 06.11.2012
Provincia di Pistoia	Delibera di Giunta n.156 del 08.11.2012
Comune di Pistoia	Delibera di Giunta n.321 del 08.11.2012
Comune di Pisa	Delibera di Giunta n.203 del 06.11.2012
Comune di Arezzo	Delibera di Giunta n.498 del 07.11.2012
Regione Toscana	Delibera di Giunta n.249 del 15.04.2013



CITTÀ METROPOLITANA
DI FIRENZE



comune di
PRATO



Provincia di
PRATO



COMUNE
DI PISTOIA



Provincia di
PISTOIA



Comune
di Pisa



Comune
di AREZZO

Regione Toscana



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Data Model



Km4City Ontology - RDF Store



Ontology Documentation:

<http://www.disit.org/6506>

<http://www.disit.org/6507>

<http://www.disit.org/5606>

<http://www.disit.org/6461>

- Temporal reasoning
- Metadata on the data
- Statistics
- Risk and Resilience
- Licensing
- Open and Private Data
- Static and Real time
- ..

- Street-Guide
- Mobility and transport
- Points of interest
- Sensors, IOT, ..
- Energy
- Administration
- Citations from strings
- ..



Big Data Tools



LOD and reasoners



Present data Tuscany Region

Road Graph (Tuscany region)

132,923 Roads
389,711 Road Elements
318,160 Road Nodes
1,508,207 Street Numbers

Services (20 cat, 512 cat.)

16 Pub. Transport Operators
21.280 Bus stops & 1081 bus lines
210 Parking areas
796 Traffic Sensors
Info on: points, paths, areas, etc.

Dynamic/real-time

- bus lines: 144 updates X day X line
- **NEW:** Timeline PT: 1081 lines, 1-2 updates per day
- parking status: 76 updates X day X sensor
- traffic Sensors: 288 updates X day X sensor
- weather: 2 updates X day for 285 areas
- **NEW:** Triage status: 96 updates per day, per hospital
- **NEW:** Fuel stations: 1 update per day, 1600 stations
- **NEW:** environmental data:
- events: about 60 new events X day
- Wi-Fi: > 350.000 measures X day
- mobiles: > 50.000 measures X day
- more than 35.000 distinct users X day
- From 600.000 to 4.5 M Tweets X day
-+ many IOT are coming

DISIT lab, Sii-Mobility, Km4City, Aprile 2017

Servizi Regolari Servizi Trasversali

search text into service

Categorie Servizi

- ☒ De/Select All
- ☒ Accommodation +
- ☒ Advertising +
- ☒ AgricultureAndLivestock +
- ☒ CivilAndEdilEngineering +
- ☒ CulturalActivity +
- ☒ EducationAndResearch +
- ☒ Emergency +
- ☒ Entertainment +
- ☒ Environment +
- ☒ FinancialService +
- ☒ GovernmentOffice +
- ☒ HealthCare +
- ☒ IndustryAndManufacturing +
- ☒ MiningAndQuarrying +
- ☒ ShoppingAndService +
- ☒ TourismService +
- ☒ TransferServiceAndRenting +
- ☒ UtilitiesAndSupply +
- ☒ Wholesale +
- ☒ WineAndFood +

N. risultati: Nessun Limite

Raggio ricerca 100 metri

Risultati della ricerca

più di 4000 risultati, attivato clustering

Services 16858



- Nascondi Menu

Previs

ZE:

Giovedì

Venerdì

Sabato

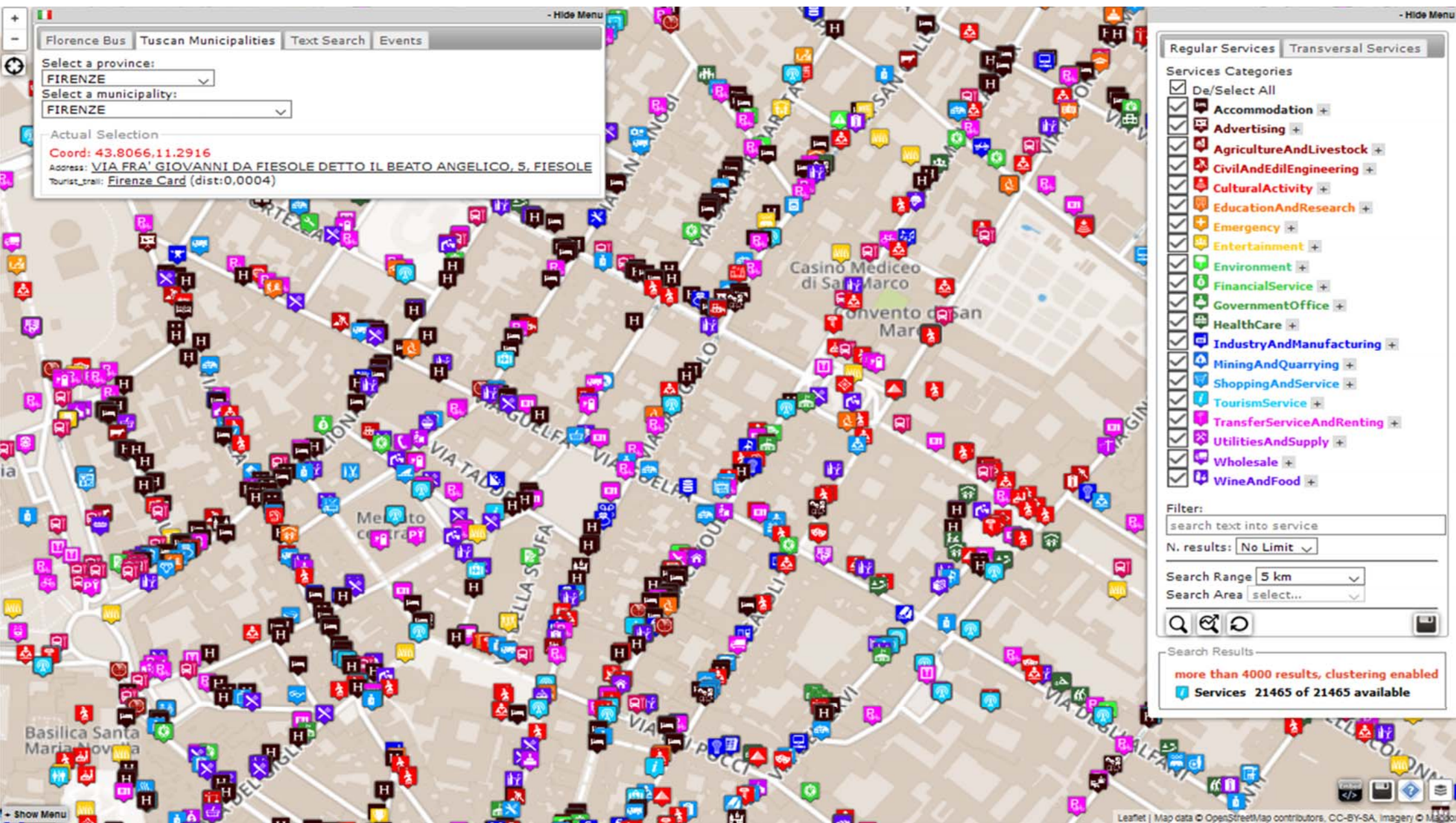
poco nuvoloso 23°C / 27°C

poco nuvoloso 20°C / 33°C

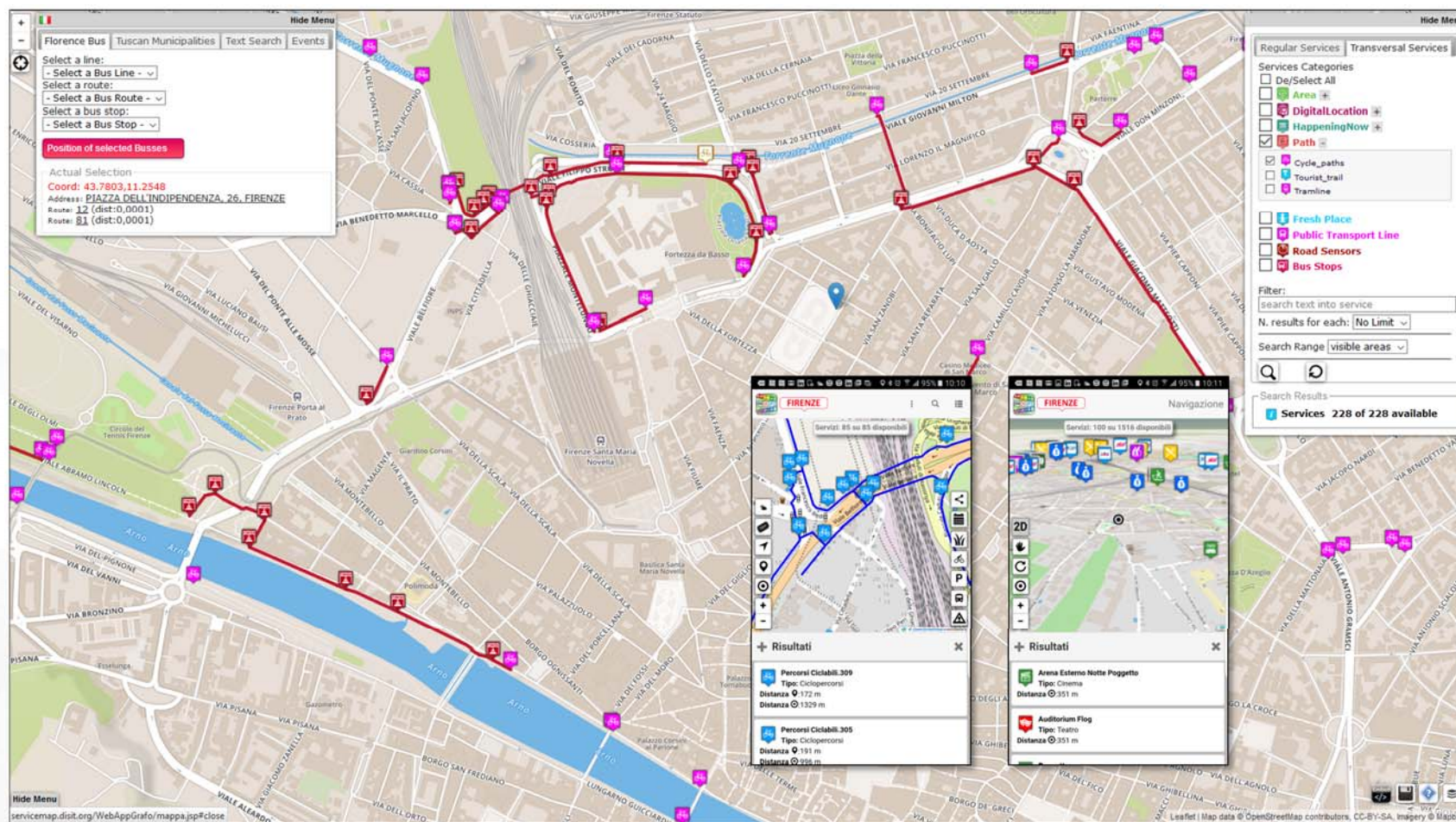
poco nuvoloso

velato

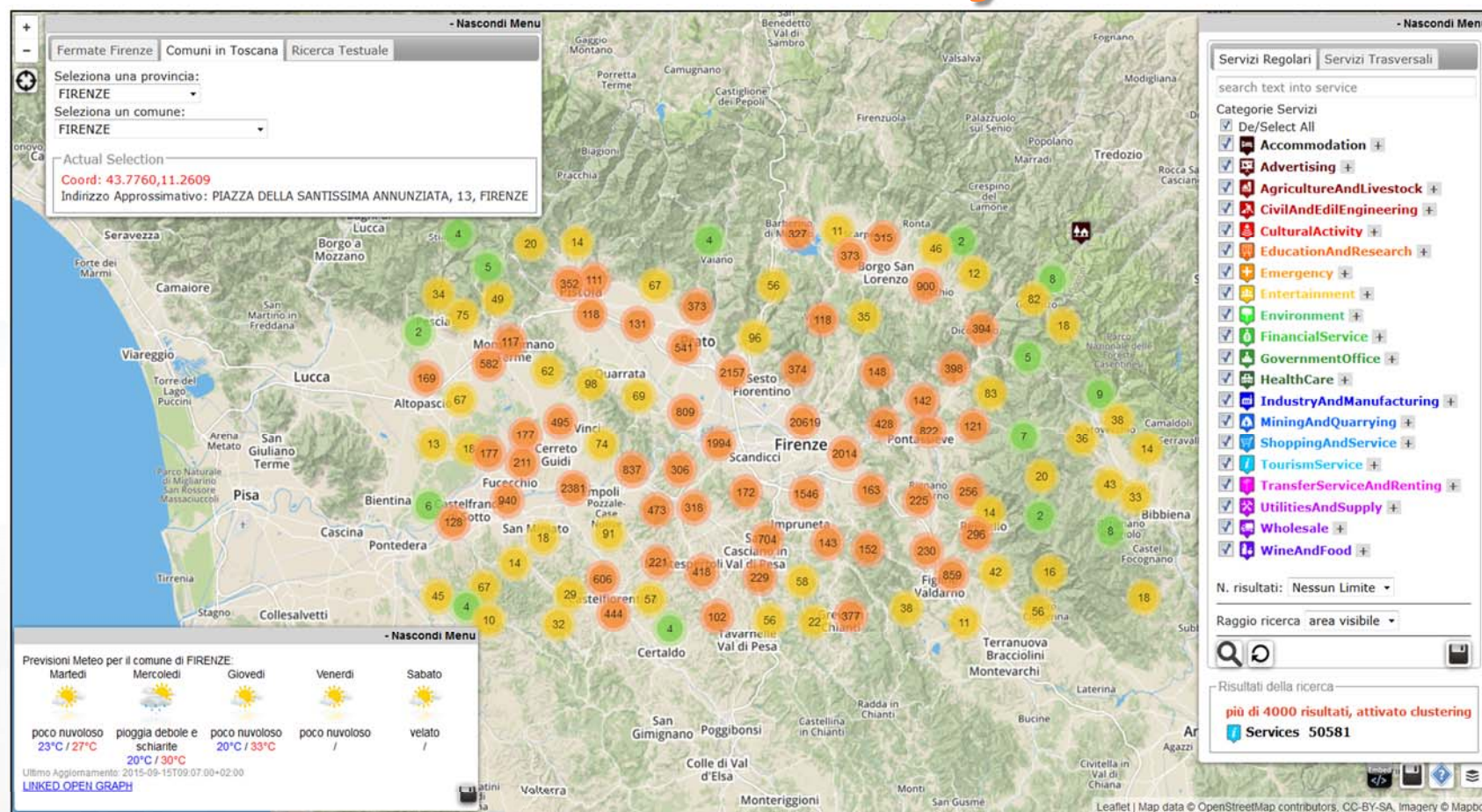
<http://servicemap.km4city.org>



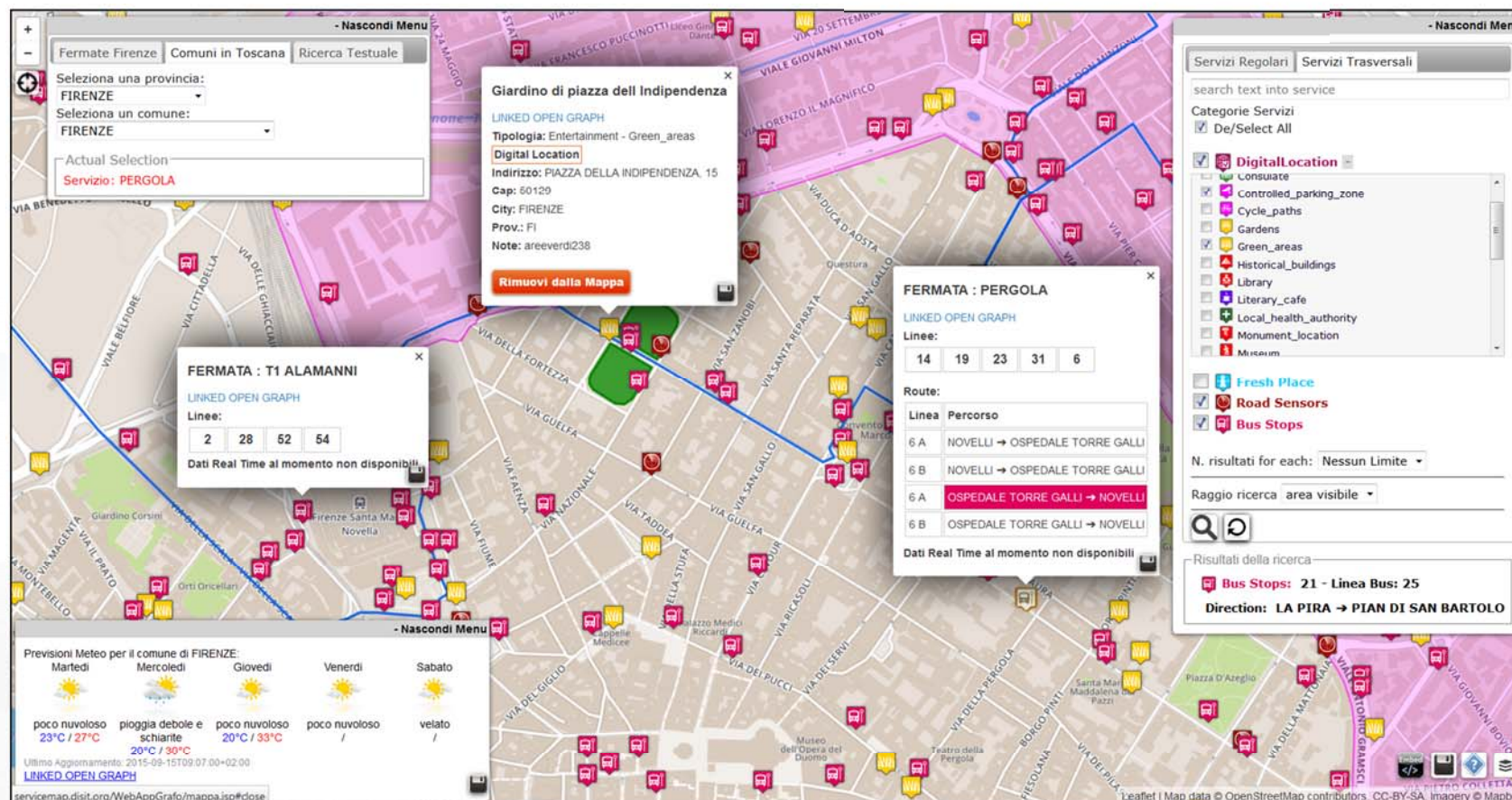
Cycling Paths



Firenze and beyond



- *Search all services in the area*



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



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Pisa
only
POI

FileModificaVisualizzaCronologiaSegnalibriTifeStrumentiAiuto

Km4City Development an...ServiceMap

servicemap.disit.org/WebAppGrafo/mappa.jsp

Cerca

HomeStarFavoritesSharePrintFull Screen

Hide Menu

Florence Bus

Tuscan Municipalities

Text Search

Events

Select a province:

PISA

Select a municipality:

PISA

Actual Selection:

Service: Osteria Il Fantasma dell'Opera

Regular Services

Transversal Services

Services Categories

☒ De/Select All

☒ Accommodation

☒ Advertising

☒ AgricultureAndLivestock

☒ CivilAndEdilEngineering

☒ CulturalActivity

☒ EducationAndResearch

☒ Emergency

☒ Entertainment

☒ Environment

☒ FinancialService

☒ GovernmentOffice

☒ HealthCare

☒ IndustryAndManufacturing

☒ MiningAndQuarrying

☒ ShoppingAndService

☒ TourismService

☒ TransferServiceAndRenting

☒ UtilitiesAndSupply

☒ Wholesale

☒ WineAndFood

Filter:

search text into service

N. results: No Limit

Search Range 100 mt

Search Area select...

Search Results

Services 1058

Weather Forecast for Municipality of : PISA

Saturday

Sunday

Monday

Tuesday

Wednesday

cloudless

cloudy

overcast

light rain

bit cloudy

4°C / 11°C

-2°C / 10°C

6°C / 10°C

Latest Update: 2016-12-17T08:51:00+01:00

LINKED OPEN GRAPH

Map of Pisa showing various points of interest (POI) marked with icons. The Arno river is visible flowing through the city.

Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

ENG 19:20

Other Sensors and Actuators, IOT

- Restricted Traffic Zone Gates
 - Passages, payment, alerts,
 - Wi-Fi control, RFI control, etc.
- Road Direction manager: panel, red-light, etc.
 - Status and action
- Environmental Sensors:
 - Air quality, pollution, rain, allergens, temperature,
 - humidity,...
- Public Light Pillar
 - Traffic flows, environment,
 - Wi-Fi, Tv-Camera, BT servers, on/off, percentage of light, ..
- Waste Manager
 - Level, kind, status, on/off
- Recharge station, column
 - Free slots, consumption, next time slot, ...



- **Environmental Sensors:**
 - Air, temperature, humidity,
 - water level in rivers
 - Status of underpass and bridges
- **Risk assessment**
 - Value of the buildings,
 - hydrogeological risk map,
 - earthquake risk map, ...
 - people distribution and location
 - Position of recover places,
- **Traffic Zone Gates**
 - Passages, alerts,
 - etc.





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Come funziona Hackathon



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DISIT lab, Sii-Mobility, Km4City, Aprile 2017

L'hackathon

- Gruppi composti fino a 4-5 persone
- Devono proporre la loro candidatura entro il 21 Marzo come indicato in pagina web:
 - 5 slide, video,
- Pre-Selezione....
- I gruppi selezionati vengono ammessi all'hackathon del 7-8 Aprile
- La competizione...
- La scelta dei vincitori...
- contratto di collaborazione compatibilmente con un eventuale impegno successivo dei vincitori.





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Pre-selezione

- **Criteri:**

- Copertura tematica: Trasporto pubblico; Coinvolgimento dei cittadini, mobilità e turismo, mobilità e servizi, giochi in mobilità.
- Copertura della tipologia: studenti, aziende, etc.
- Copertura geografica: città, provincia, urbano/rurale, etc.
- Affidabilità: competenza dei partecipanti, esperienza, ...
- Consistenza del gruppo: numero ed età,...
- Tipologia di proposta:
 - (a): eventuale sovrapposizione con servizi già presenti o pianificati (si veda slide e video evento del 24 gennaio).
 - (b): impatto e ricadute sociali
- Coerenza con gli obiettivi di Sii-Mobility
- Max Fino ad esaurimento dello spazio
- Alcuni gruppi possono non essere ammessi in base ai criteri



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L'hackathon



- **7 Aprile mattina**, presentazione:
 - Evento ed apertura con Patrocinatori
 - API e/o modifiche rispetto a quelle presentate il 17 Marzo
 - Obiettivi dell'hackathon
 - Criteri e Giuria
 - Chiusura della parte “pubblica”, aperta anche alle persone non in hackathon
- **7 pomeriggio**: inizio hackathon, coding, business, etc., sviluppo a gruppi fino a tarda serata, locali nel parco di S. Marta
 - Solo per i partecipanti all'hackathon
- **8 mattina**: coding e preparazione della presentazione finale
 - Solo per i partecipanti all'hackathon
- **8 primo pomeriggio**: presentazione dei gruppi davanti alla giuria di esperti: slide, dimostrazione
 - **18:00 circa**: Premiazione aperta ma con registrazione e soggetta ad accettazione durante il 7 mattina.
 - Protezione delle idee....



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Valutazione



- **Preselezione:**

- Coerenza con gli obiettivi di Sii-Mobility
- Copertura tematica: Trasporto pubblico; Coinvolgimento dei cittadini, mobilità e turismo, mobilità e servizi, giochi in mobilità.
- Copertura geografica: città, provincia, urbano/rurale, etc.

- **Criteri:**

- Innovatività del prodotto/idea
- Realizzazione tecnica del software
- Business model fattibile (dati accessibili, etc..)
- Tipologia di esigenza che va a colmare
- usabilità della soluzione.

premiazione



- **Premi fino a:**

- Fino a 1 vincitore per area, e fino a 2 supervincitori
 - Persone fisiche
- Campagna di divulgazione dei prodotti e prototipi
- I supervincitori potranno accedere ad un contratto di collaborazione per 6 mesi per la finalizzazione dell'App o del modulo, le cui modalità saranno gestite dal coordinatore scientifico del progetto Sii-Mobility su indicazione della giuria di valutazione, in conformità a:
 - normativa della pubblica amministrazione sui contratti e su IPR
 - impegno che possono concedere I vincitori.



Tipologie

- **(a) Moduli che pensati e sviluppati per essere integrati nell'App Firenze Dove Cosa/Toscana Dove Cosa:**
 - *Tecnologia specifica, ambiente modulare Open Source accessibile su GitHub -- Si veda <http://www.sii-mobility.org/index.php/eventi/mobile-app-workshop>*
 - *Pubblicazione open source come modulo: cessione della proprietà intellettuale*
- **(b) App indipendente che usa solo le API non i moduli AppDevKit di Sii-Mobility**
 - *Qualsiasi linguaggio, nessun vincolo tecnico, etc.*
 - *App not for profit dipendentemente dalle API/dati utilizzati*



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Dati Aggiuntivi



- **Uso di Dati Aggiuntivi e' consentito:**
 - a livello server o direttamente nel client
 - Open o privati
 - Statici o real time
 - Caricamento dentro Km4City e' preferibile anche se non effettuato direttamente durante l'hackathon
- **App e Moduli che vengono proposti ma che possono lavorare solo con la presenza di dati che non possono essere facilmente ottenuti sono sconsigliate.**



Documentazione




- Hackathon su Sii-mobility.org <http://www.sii-mobility.org/index.php/eventi/hackathon-sii-mobility>
- pagina ["Workshop su App development" del 24 Gennaio 2017](http://www.sii-mobility.org/index.php/eventi/mobile-app-workshop)
 - <http://www.sii-mobility.org/index.php/eventi/mobile-app-workshop>
- overview su Smart City API: <http://www.disit.org/6920>
- Link alla documentazione online primaria per le [Smart City API](#)
- Pagina di ServiceMap per le API e la verifica de dati: <Http://servicemap.disit.org>
- Scarica il Flyer di Km4City: <http://www.km4city.org/km4city-booklet-v02-21x21-md1.pdf>
- pagina web Km4City: <http://www.km4city.org>
- pagina Open Source di DISIT Org: <http://www.disit.org/6763>
- [VIDEO "FIRENZE dove cosa" Mobile App \(kit promozione\), le app sono accesibili sugli store](#)
- [VIDEO "TOSCANA dove, cosa" Mobile App \(kit promozione\), le app sono accessibili sugli store](#)
- [GUIDA e strumenti: Programmazione ETL per Data Warehouse](#)
- [esempi di processi formalizzati in ETL per il DataWarehouse](#)
- video youtube sulla piattaforma: <https://www.youtube.com/watch?v=YjUH-dKVkUM>



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Engaging Users via Apps



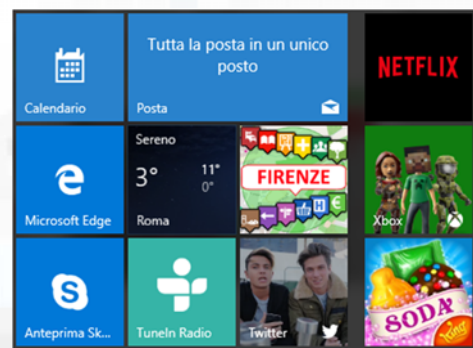
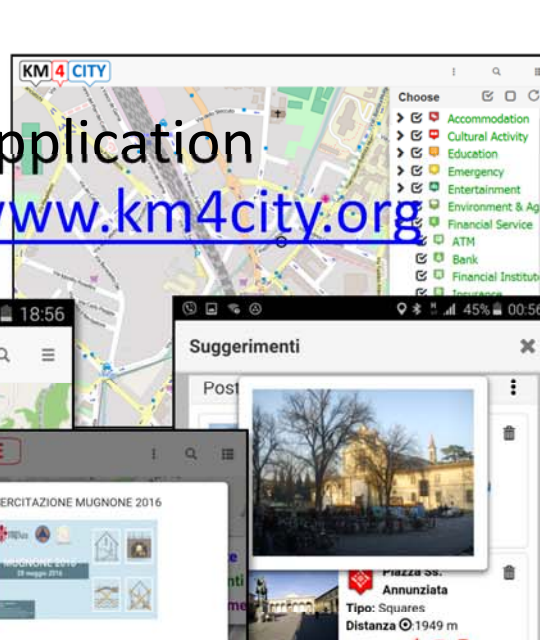
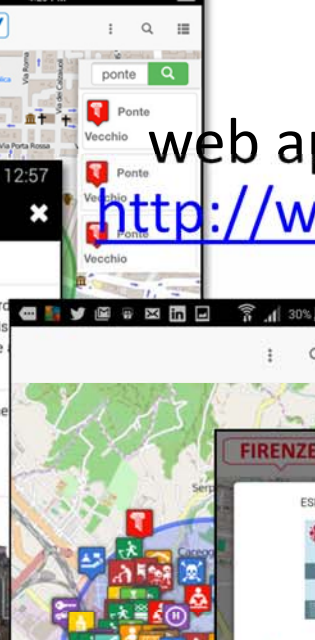
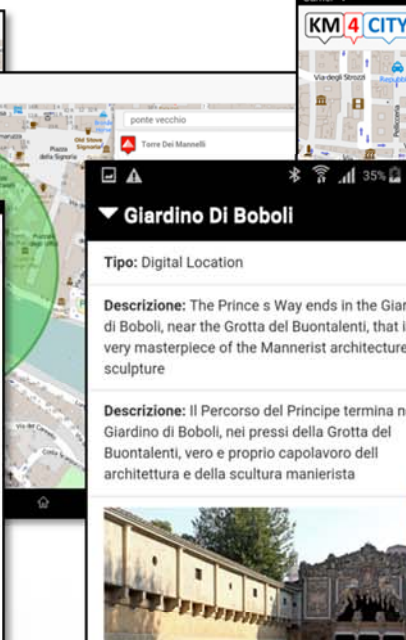
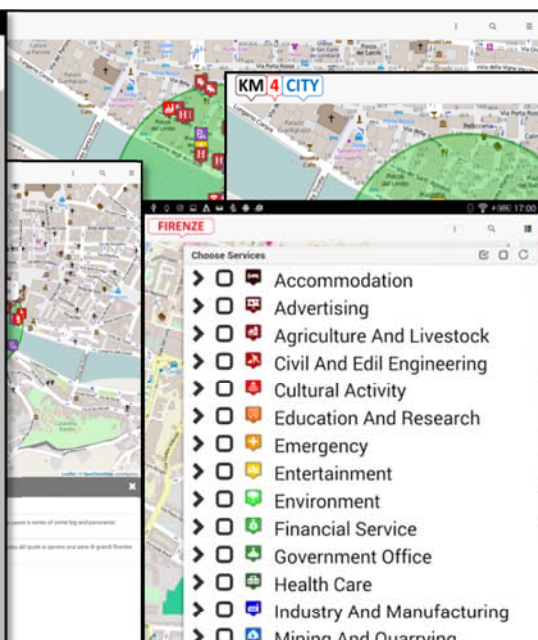
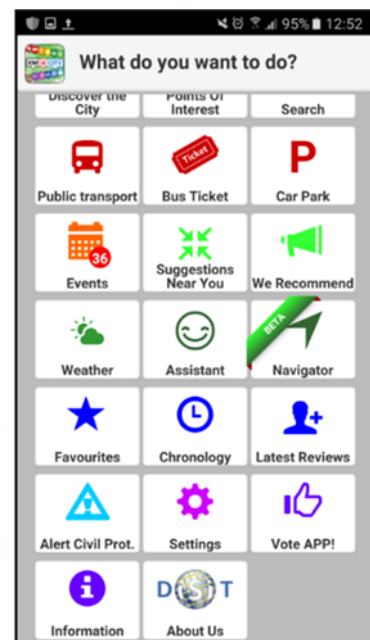


UNIVERSITÀ
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FIRENZE

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INGEGNERIA
DELL'INFORMAZIONE

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DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB
<http://www.disit.org>

Mobile App



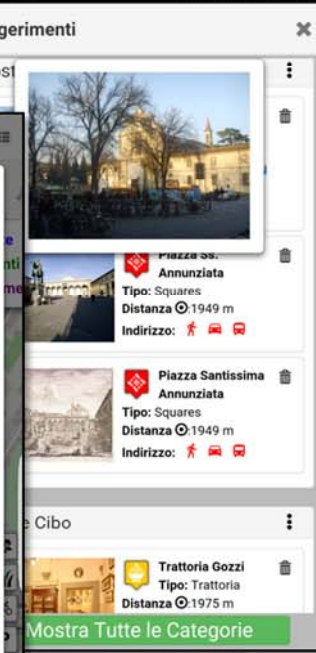
web application
<http://www.km4city.org>

FIRENZE

ESERCITAZIONE MUGNONE 2016

prevede: Firenze (FI) (ZONA: A3)

RISCHIO	TEMPI	ALLERTA
IDROGEOLOGICO IDRAULICO RETICOLO MINORE	Dalle ore 13.00 di Venerdì 27 maggio 2016 alle ore 18.00 di Venerdì 27 maggio 2016	GIALLO
IDROGEOLOGICO IDRAULICO RETICOLO MINORE	Dalle ore 18.00 di Venerdì 27 maggio 2016 alle ore 12.00 di Sabato 28 maggio 2016	ARANCIONE

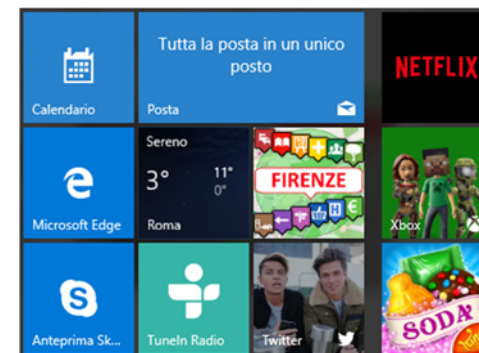


DISIT lab, Sii-Mobility, Km4City, Aprile 2017



Mobile and Web App

Windows 10



- <https://www.microsoft.com/en-us/store/p/firenze-dove-cosa-km4city/9nblggh5xx4v>
- <https://www.microsoft.com/en-us/store/p/toscana-dove-cosa-km4city/9nblggh6jdnd>

HTML



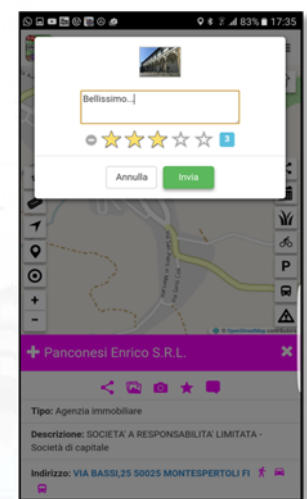
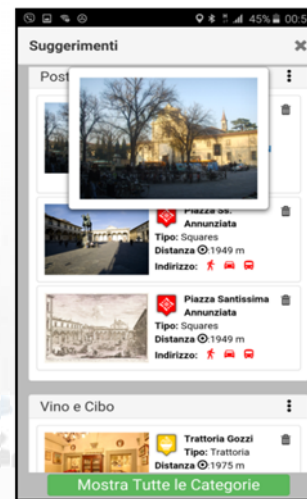
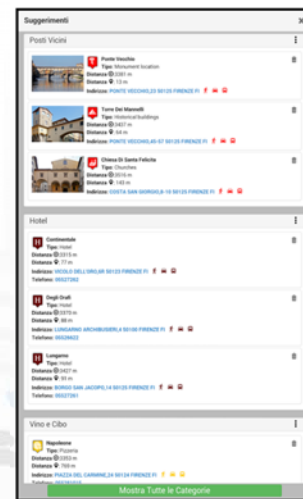
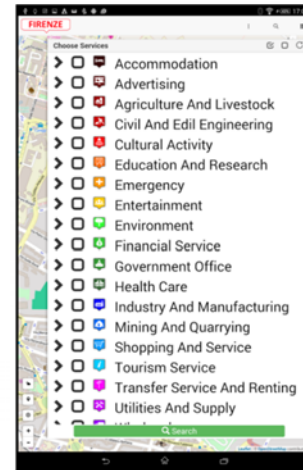
HTML5 version

- <http://www.km4city.org/webapp/>

Mobile APP, features 1/3



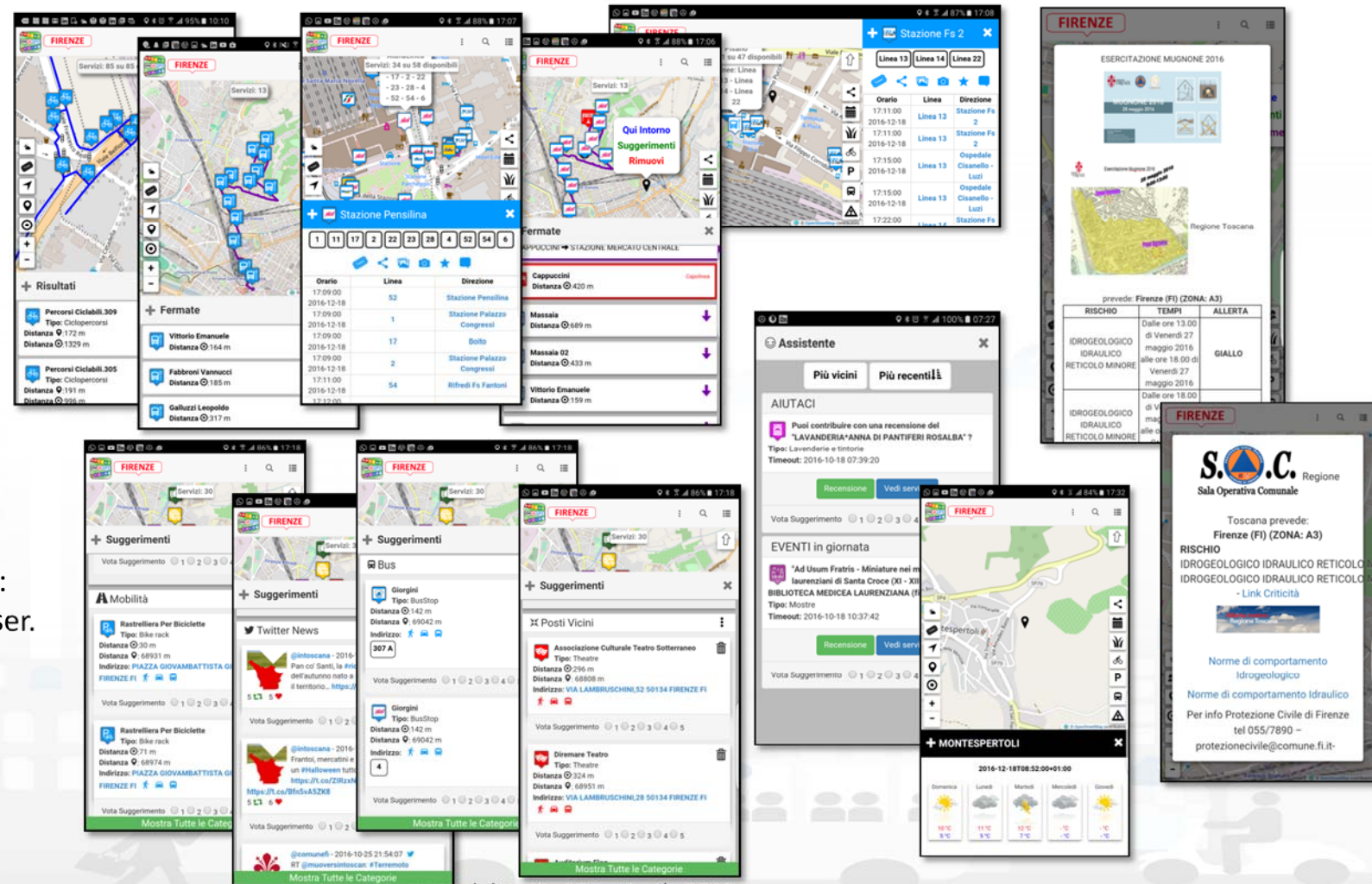
- **5 languages:** IT, EN, SP, DE, FR
- **Profiles** city users: Citizens, commuter, student, tourist, operator, etc..
- **Profiled Menu** per POI
 - adaptive
- **Main Menu: dynamic, and personalized**
- **Search Text**
- Search per POI
 - Near to you, near to a point, line...
- Other search
 - Close to you, events green areas, public transport, tickets , Cycling, parking,
 - Etc.
- POI
 - Preferred, Social icon
 - Ranking, Comments, images



Mobile APP, features 2/3



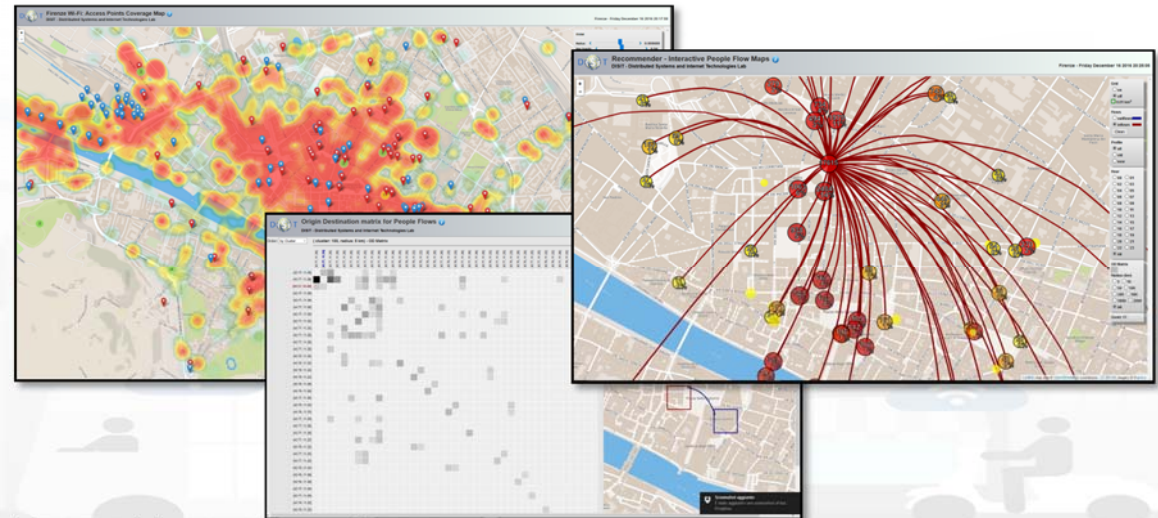
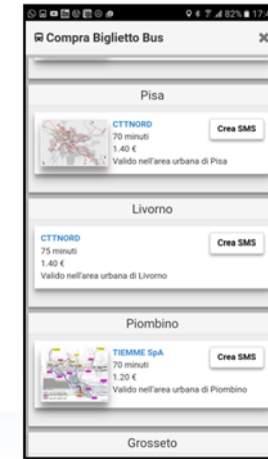
- **Mobility**
 - Paths and stops, time
 - Parking + prediction
 - Tickets
 - Flow + prediction
- **Personal Assistant**
 - Info
 - Engagement
 - Help
 - Civil protection
- **Suggestions:**
 - Personalized and adaptive: banned e typed per city user.
 - POI, Twitter, Events,
 - Weather forecast,
 - Civil Protection
 - ...



Mobile APP, features 3/3

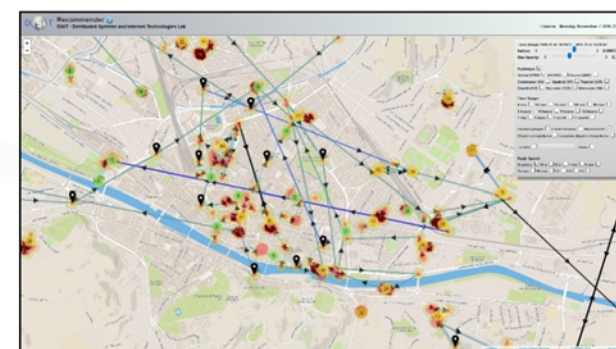
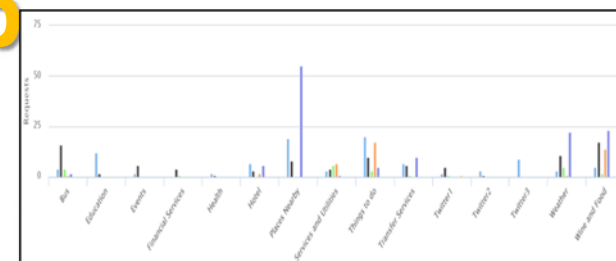


- Navigation 3D (BETA)
- Ticketing for busses
- App used are tool for city assessment
 - Wifi status
 - iBeacon status
 - User behavior analysis
 - GPS movements kinds
 - OD matrix
 - International flows



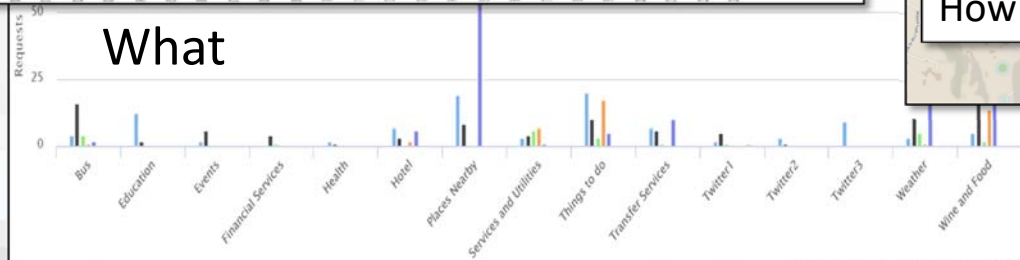
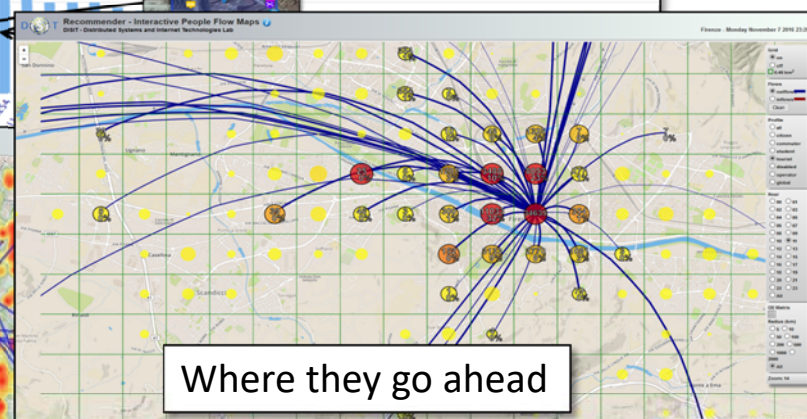
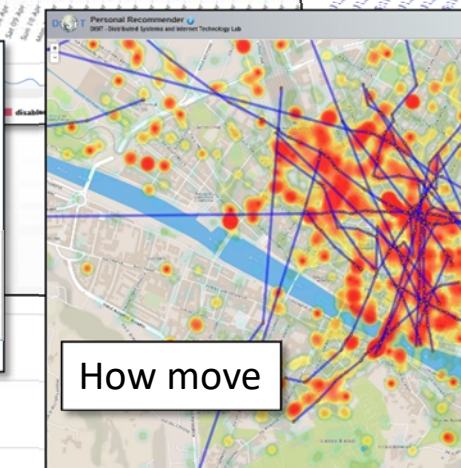
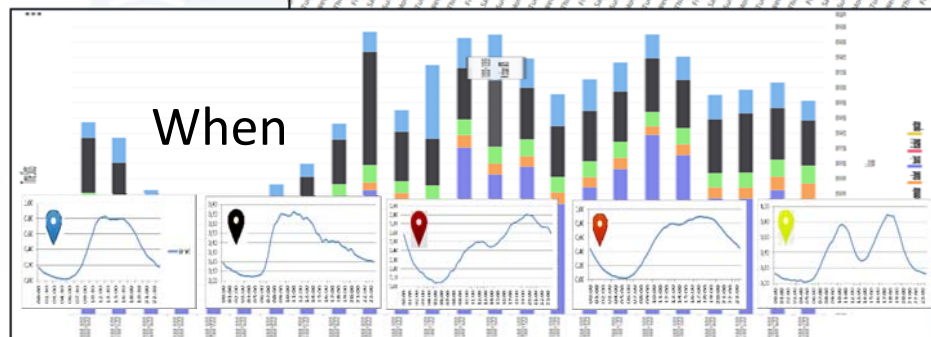
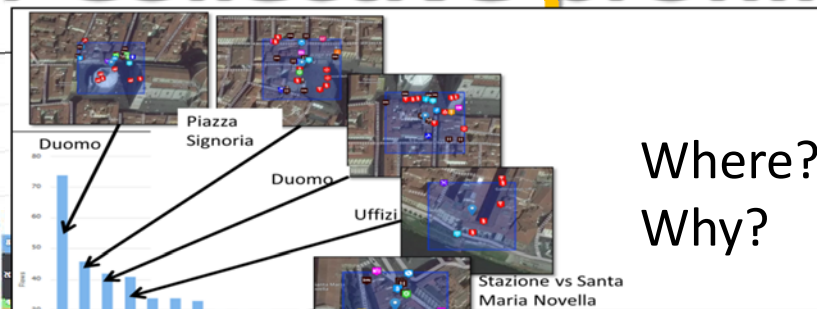
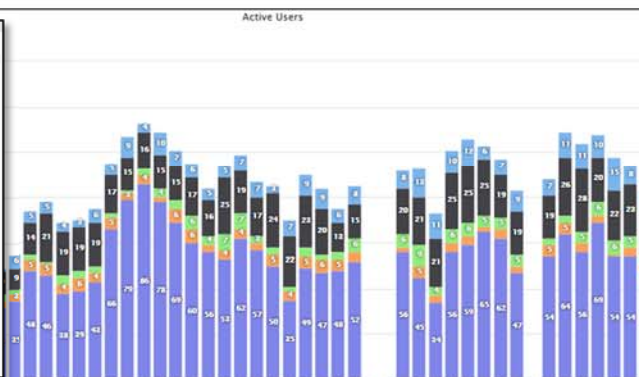
Reasoning on App Data and for App

- **User behavior analysis**
 - engagement on demand
 - Reconstruction of user behavior on the move and in the city in general
 - Pedestrian, TPL, Bike, private, etc.
- **Production of Engagements....**
- **Suggestions...**
- **Routing....**

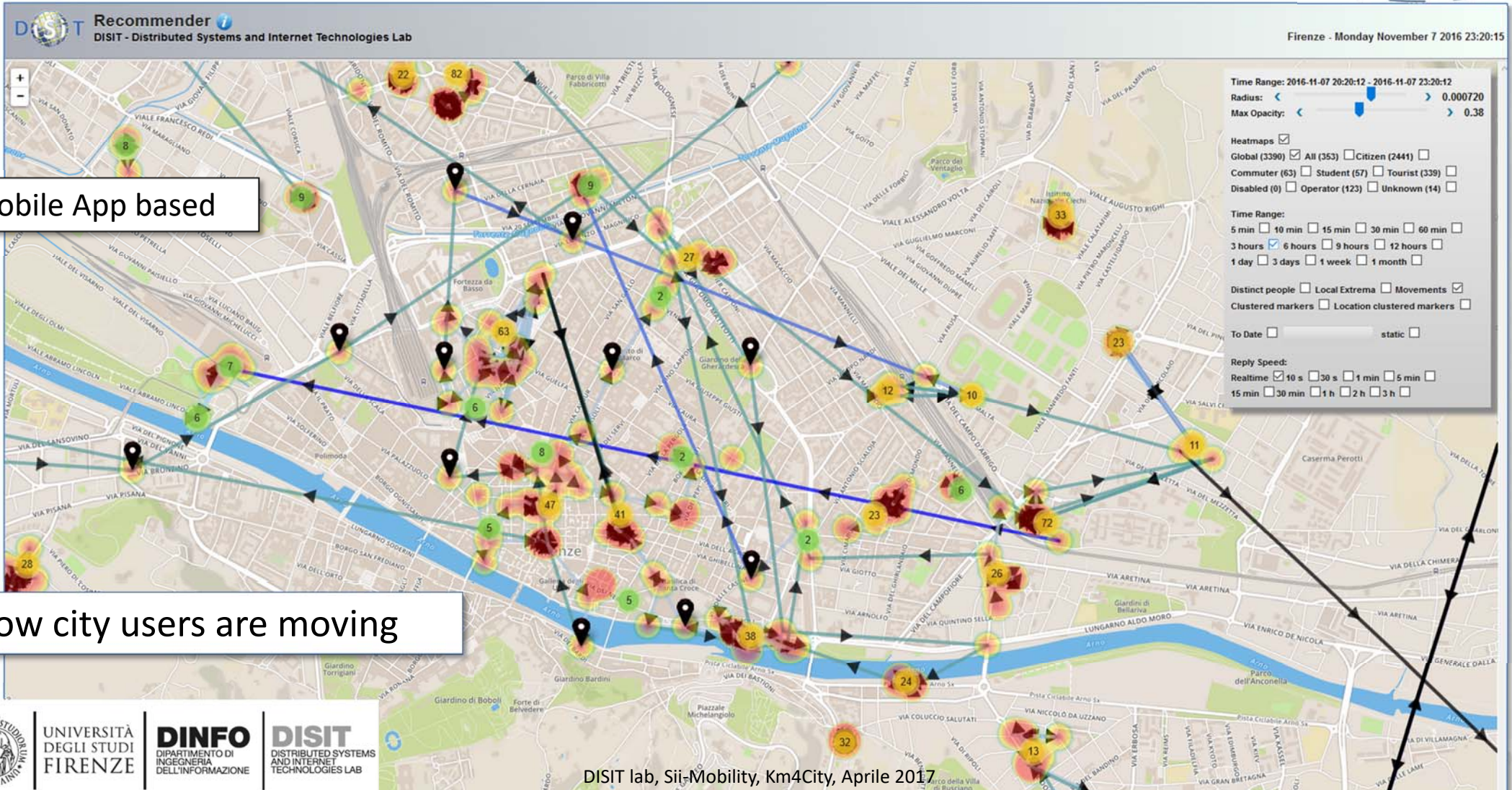


Rule name	Type	#event	#viewed	#viewed on #event	Description
daily_event_de	ENGAGEMENT	1 (0%)	0 (0%)	0%	Suggest (in german) an event currently on in Florence
daily_event_en	ENGAGEMENT	1720 (2.12%)	75 (7.1%)	4.07%	Suggest (in english) an event currently on in Florence
- commuter		5 (0.39%)	0 (0%)	0 (0%)	
- student		14 (0.81%)	0 (0%)	0 (0%)	
- tourist		1462 (88%)	25 (35.71%)	25 (1.71%)	
- citizen		113 (6.57%)	39 (55.71%)	39 (34.51%)	
- operator		0 (0%)	0 (0%)	0 (0%)	
- disabled		0 (0%)	0 (0%)	0 (0%)	
- all		119 (6.92%)	6 (5.07%)	6 (5.04%)	
daily_event_es	ENGAGEMENT	6 (0.01%)	4 (0.41%)	66.67%	Suggest (in spanish) an event currently on in Florence
daily_event_fr	ENGAGEMENT	6 (0.01%)	0 (0%)	0%	Suggest (in french) an event currently on in Florence
daily_event_it	ENGAGEMENT	5459 (6.73%)	296 (30.02%)	5.42%	Suggest (in italian) an event currently on in Florence
parking_en	ASSISTANCE	141 (0.17%)	128 (12.98%)	90.78%	Alert (in english) if the user parked in a residential parking zone
parking_es	ASSISTANCE	3 (0%)	3 (0.3%)	100%	Alert (in spanish) if the user parked in a residential parking zone
parking_it	ASSISTANCE	187 (0.23%)	1 (0.1%)	0.53%	Alert (in italian) if the user parked in a residential parking zone
short_n_photos_de	ENGAGEMENT	68 (0.08%)	1 (0.1%)	1.47%	Ask (in german) a contribution for a nearby point-of-interest

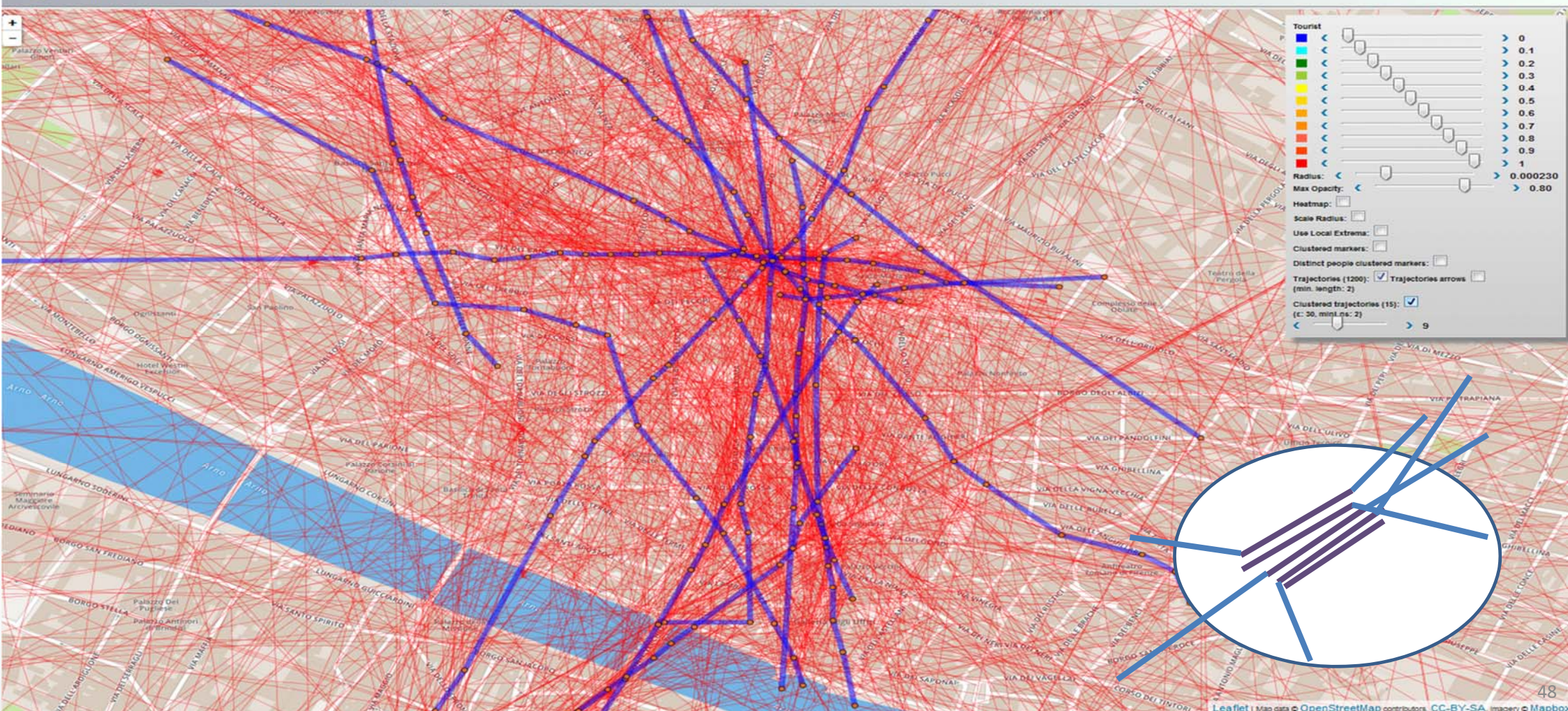
User Behavior Analyzer for Collective profiling



Anonymous User Behavior Analysis

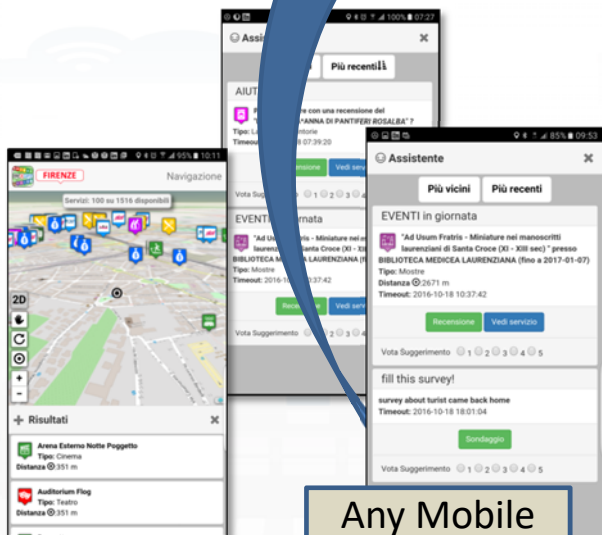


Cluster di Trajectories



User influencing, engaging, monitoring & Follow Up

City & City Operators Strategy Editor



Any Mobile
and Web
App

Rule name	Type	#sent	#viewed	#viewed on #sent	Description
daily_event_de	ENGAGEMENT	1 (0%)	0 (0%)	0%	Suggest (in german) an event currently on in
daily_event_en	ENGAGEMENT	1720 (2.12%)	70 (7.1%)	4.07%	Suggest (in english) an event currently on in
- commuter		5 (0.29%)	0 (0%)	0 (0%)	
- student		14 (0.81%)	0 (0%)	0 (0%)	
- tourist		1462 (85%)	25 (35.71%)	25 (1.71%)	
- citizen		113 (6.57%)			
- operator		0 (0%)			
- disabled		0 (0%)			
- all		119 (6.92%)			
daily_event_es	ENGAGEMENT	6 (0.01%)			
daily_event_fr	ENGAGEMENT	6 (0.01%)			
daily_event_it	ENGAGEMENT	5459 (6.73%)			
parking_en	ASSISTANCE	141 (0.17%)			
parking_es	ASSISTANCE	3 (0%)			
parking_it	ASSISTANCE	187 (0.23%)			
shoot_a_photo_de	ENGAGEMENT	68 (0.08%)			

Inform

You have parked out of your residential parking zone
The Road cleaning is this night
The waste in S.Andreas Road is full

Engage

Provide a comment, a score, etc..

Stimulate / recommend

Events in the city, services your may be interested, etc..

Provide Bonus

Since you have parked here you we can get 1 Bonus
We suggest you to leave the car out of the city, this bonus can be used to by a bus ticket



Engagement & Assistant Rules

- **Detecting** city users' habits about mobility
 - Private cars → **stimulating Bus Usage & Bikes**
 - Private cars parking → usage of **peripheral parking-lot + bus**
 - Leave the car and take the bus twice → by using **bonus, tickets..**
 - → different solutions for moving...
- **Assisting by notifying** when one is
 - parking out of the residential parking zone
 - parking in a zone subjected to cleaning in the next two days
 - entering in the restricted traffic zone
- **Suggesting** you about
 - Events, **Civil Protection Alerts**,
 - **Closer free parking** ...
- **Administering** questionnaires
 - Getting assessment about services, city experience
 -
- **Requesting** ranking, photo and/or comments





Agenda 7 Aprile



- Overview progetto Sii-Mobility
- Presentazione del modello dati
- Come funziona l'hackathon
- Ingaggiare gli utenti con le App
- Scenari di uso ? (Nesi) ←
- Development tool, Info e documentazione (Paolucci)
- Presentazione delle smart city API (P. Bellini)
- Sviluppo di Moduli per App "Toscana dove cosa"

Scenari d'uso delle API





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<http://www.disit.org>



Scenari vs SmartCity API

- Dati e aree tematiche
- Cosa sono i punti di Interesse, POI
- Empowering the city users
- Access to event information
- Supporting City Users in using Public Mobility
- Supporting City Users in using Private Mobility
- New Experience to access at Cultural and Touristic info
- New way to access at health services
- Access at Environmental information
- Profiled Suggestions to City Users
- Personal Assistant

Present data Tuscany Region

Road Graph (Tuscany region)

132,923 Roads
389,711 Road Elements
318,160 Road Nodes
1,508,207 Street Numbers

Services (20 cat, 512 cat.)

16 Pub. Transport Operators
21.280 Bus stops & 1081 bus lines
210 Parking areas
796 Traffic Sensors
Info on: points, paths, areas, etc.

Dynamic/real-time

- bus lines: 144 updates X day X line
- **NEW:** Timeline PT: 1081 lines, 1-2 updates per day
- parking status: 76 updates X day X sensor
- traffic Sensors: 288 updates X day X sensor
- weather: 2 updates X day for 285 areas
- **NEW:** Triage status: 96 updates per day, per hospital
- **NEW:** Fuel stations: 1 update per day, 1600 stations
- **NEW:** environmental data:
- events: about 60 new events X day
- Wi-Fi: > 360.000 measures X day
- mobiles: > 50.000 measures X day
- more than 38.000 distinct users X day
- From 600.000 to 4.5 M Tweets X day
-+ many IOT are coming

DISIT lab, Sii-Mobility, Km4City, Aprile 2017

Servizi Regolari Servizi Trasversali

search text into service

Categorie Servizi

- ☒ De/Select All
- ☒ Accommodation +
- ☒ Advertising +
- ☒ AgricultureAndLivestock +
- ☒ CivilAndEdilEngineering +
- ☒ CulturalActivity +
- ☒ EducationAndResearch +
- ☒ Emergency +
- ☒ Entertainment +
- ☒ Environment +
- ☒ FinancialService +
- ☒ GovernmentOffice +
- ☒ HealthCare +
- ☒ IndustryAndManufacturing +
- ☒ MiningAndQuarrying +
- ☒ ShoppingAndService +
- ☒ TourismService +
- ☒ TransferServiceAndRenting +
- ☒ UtilitiesAndSupply +
- ☒ Wholesale +
- ☒ WineAndFood +

N. risultati: Nessun Limite

Raggio ricerca 100 metri

Risultati della ricerca

più di 4000 risultati, attivato clustering

Services 16858



Previs

Prova

Previsione meteo:

Giovedì: poco nuvoloso 23°C / 27°C

Venerdì: poco nuvoloso 20°C / 33°C

Sabato: velato

<http://servicemap.km4city.org>

- Nascondi Menu

Fermate Firenze Comuni in Toscana Ricerca Testuale

Seleziona una provincia:
FIRENZE

Seleziona un comune:
FIRENZE

Actual Selection
COMUNE di FIRENZE

Servizi Regolari **Servizi Trasversali**

search text into service

Categorie Servizi

- ☒ De/Select All
- ☒ Accommodation +
- ☒ Advertising +
- ☒ AgricultureAndLivestock +
- ☒ CivilAndEdilEngineering +
- ☒ CulturalActivity +
- ☒ EducationAndResearch +
- ☒ Emergency +
- ☒ Entertainment +
- ☒ Environment +
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- ☒ HealthCare +
- ☒ IndustryAndManufacturing +
- ☒ MiningAndQuarrying +
- ☒ ShoppingAndService +
- ☒ TourismService +
- ☒ TransferServiceAndRenting +
- ☒ UtilitiesAndSupply +
- ☒ Wholesale +
- ☒ WineAndFood +

N. risultati: Nessun Limite

Raggio ricerca 100 metri

Risultati della ricerca

più di 4000 risultati, attivato clustering

Services 16858

KM4CITY

Previs

Giovedì Venerdì Sabato

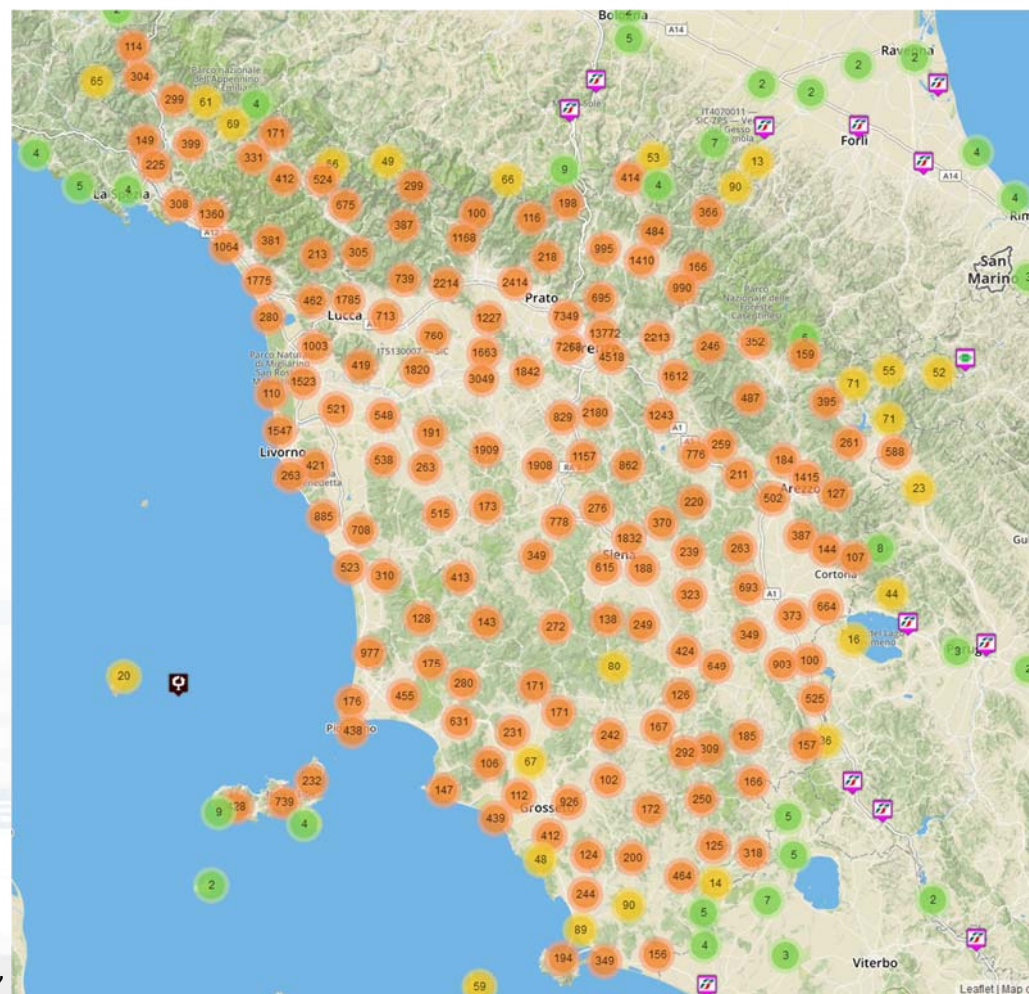
poco nuvoloso 23°C / 27°C schiarite 20°C / 33°C poco nuvoloso / velato /

<http://servicemap.km4city.org>

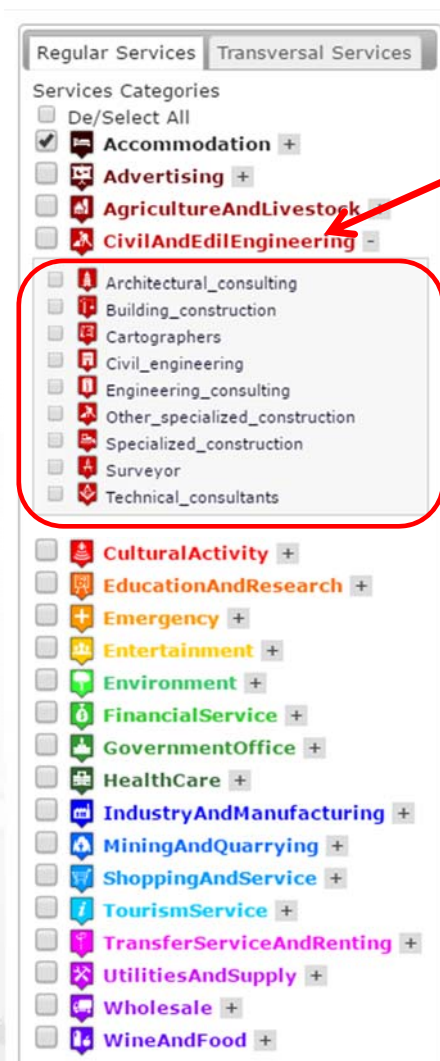
DISIT Lab, Sii-Mobility, Km4City, Aprile 2017

Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

- **Street and geoinformation of the territory and details for routing, navigation, ...**
- **Mobility and Transport:** public and private, public transport, parking status, fuel stations prices, traffic sensors, etc.
- **Culture and Tourism:** POI, churches, museum, schools, university, theatres, events in Florence
- **Environmental:** pollution real time, weather forecast, etc.
- **Social Media:** twitter data
- **Health:** hospital, pharmacies, status of the first aid triage in major hospitals, ...
- **Alarms:** civil protection alerts, hot areas, ...

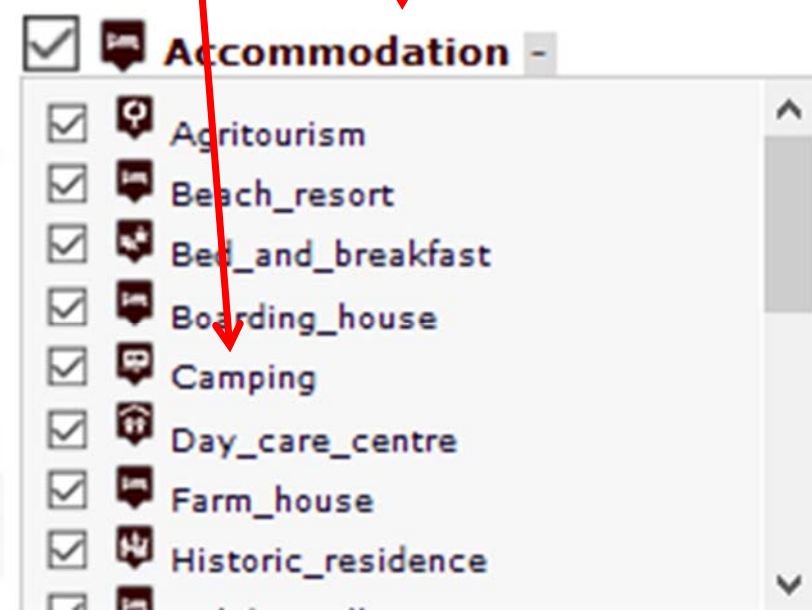


Concepts of Services: Macro and subcategory



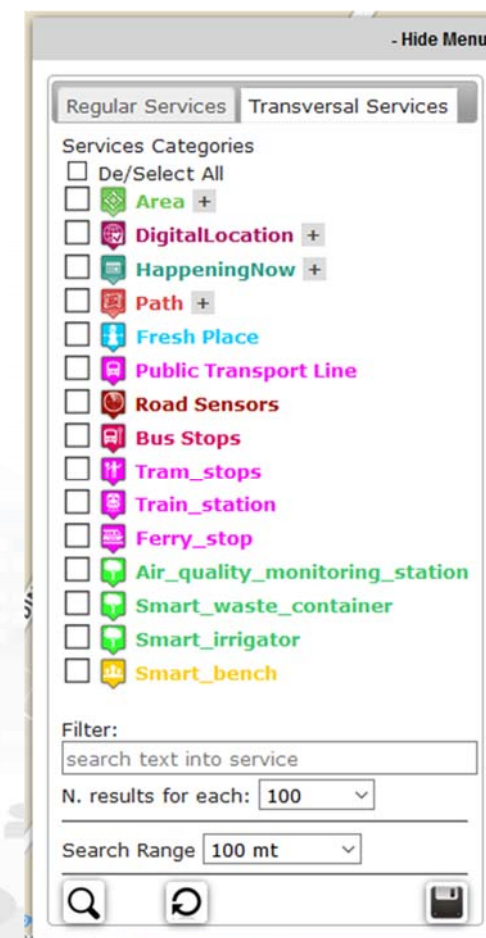
20 Service Macro Classi

Service Class



Access to Point of Interest information, POI

- **POI:** point of interest:
- **type:** macro and categoria
- **Position:** GPS, address, telephone, fax, email, URL, ..
- **Description:** textual, multilingua, with images, ...
- **Link** to dbPedia, Linked Open Data
- **Links to other services**
- **Real time data if any:** sensors data, timeline, events, prices, opening time, rules of access, status of services, status of queue, etc..
- *See transversal services on ServiceMap*
– Regular and in test platform



Service Information: different kind of services

AURORA

[LINKED OPEN GRAPH](#)

Tipology: Accommodation - Hotel

Email: info@hotelaurore.info

Website: www.hotelaurore.info

Phone: 055210283

Address: VIA L. ALAMANNI, 5

Cap: 50100

City: FIRENZE

Prov.: FI

TPL STOP : Piazza Stazione (Fr. Cc)

Vaubus

[LINKED OPEN GRAPH](#)

Lines:

No available routes

Display Bus per page

Search:

Time	Line	Direction
08:48:00 2017-03-20	FI-LU	Piazzale Verdi
08:16:00 2017-03-20	FI-LU	Piazzale Verdi
10:09:00 2017-03-20	FI-LU	Piazzale Verdi
017-03-20	FI-LU	Piazzale Verdi
017-03-20	FI-LU	Piazzale Verdi
017-03-20	FI-LU	Piazzale Verdi

Page 1 of 1

Data currently not available

Loggia San Paolo

[LINKED OPEN GRAPH](#)

Tipology: CulturalActivity - Monument_location

[Digital Location](#)

Address: VIA DELLA SCALA, 3

Cap: 50123

City: FIRENZE

Prov.: FI

Photos:

Description: The rounded arches, the stone skeleton and the glazed terracotta medallions recall the model of the Loggiato degli Innocenti. The medallions in glazed terracotta by Andrea della Robbia and his sons Marco and Luca contain seven polychrome figures of Santi Francescani and two works of mercy Cristo conforta un Giovane and Cristo conforta un Anziano. Beneath the portico can be admired the expressive embrace between San Domenico Guzman and San Francesco d Assisi by Andrea della Robbia

Giardino di piazza dell Indipendenza

[LINKED OPEN GRAPH](#)

Tipology: Entertainment - Green_areas

[Digital Location](#)

Address: PIAZZA DELLA INDIPENDENZA, 15

Cap: 50129

City: FIRENZE

Prov.: FI

Note: areeverdi238

[Remove from map](#)

ZCS_1_D

[LINKED OPEN GRAPH](#)

Tipology: TransferServiceAndRenting - Controlled_parking_zone

[Digital Location](#)

Address: VIA GUSCIANA

Cap: 50124

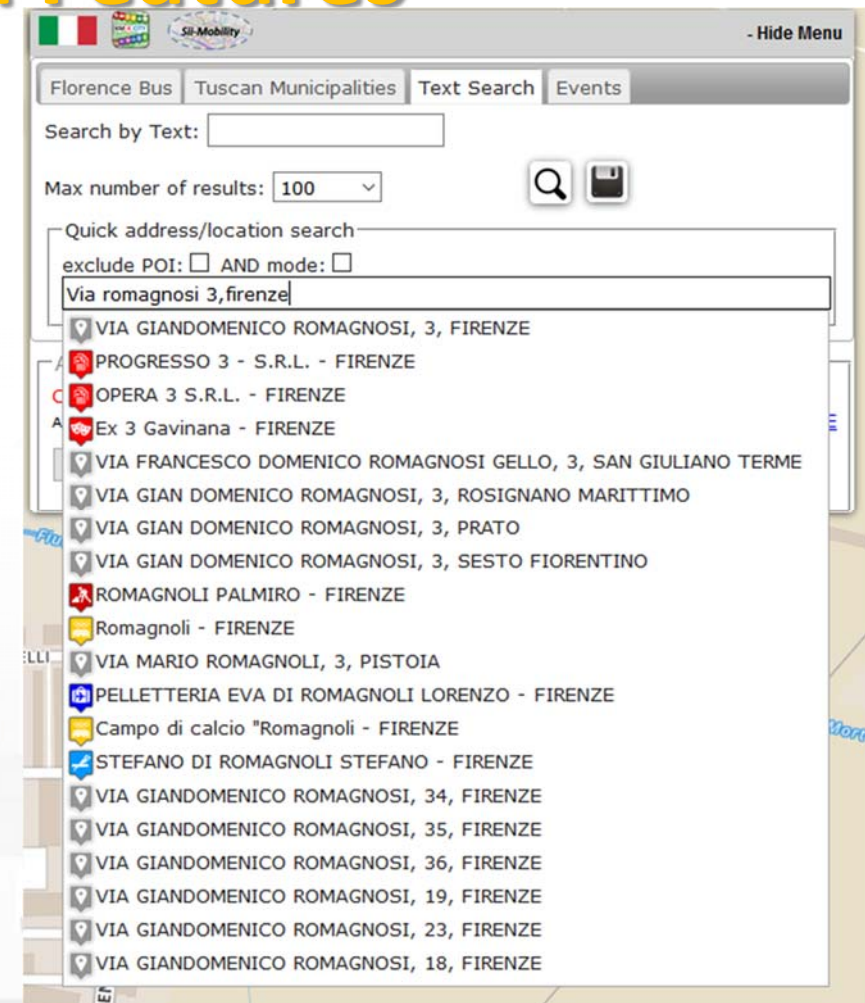
City: FIRENZE

Prov.: FI

[Remove from map](#)

General Text Search Features

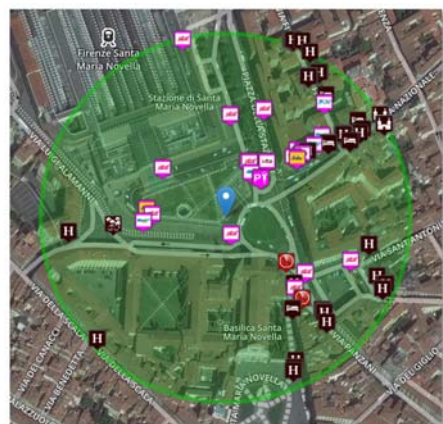
- **Search by text for POIs via**
 - Full text: description, title, macro and category name
 - Filtering by macro and category
 - Filtering on distance and geometric shape
- **Search by text with assisted suggestion to get:**
 - Streets and civic numbers, or POI, locations



Search by Shape and Distance

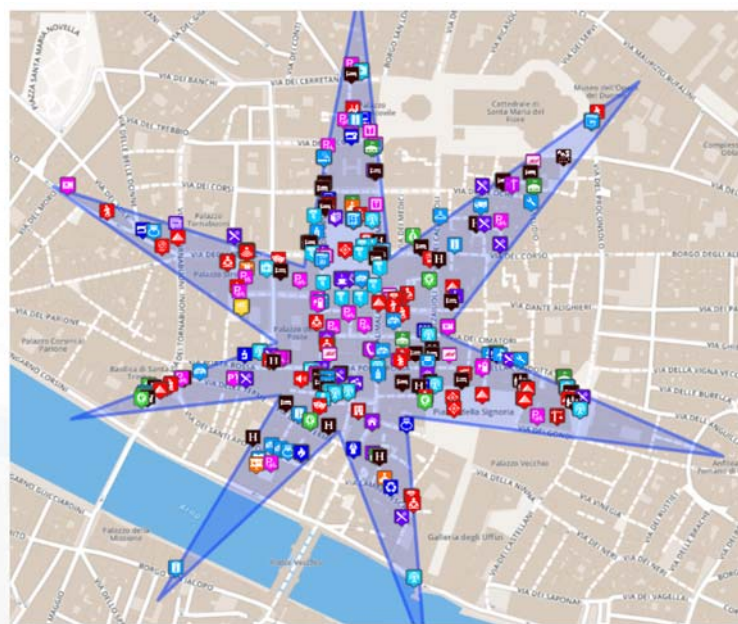


Around a point or POI

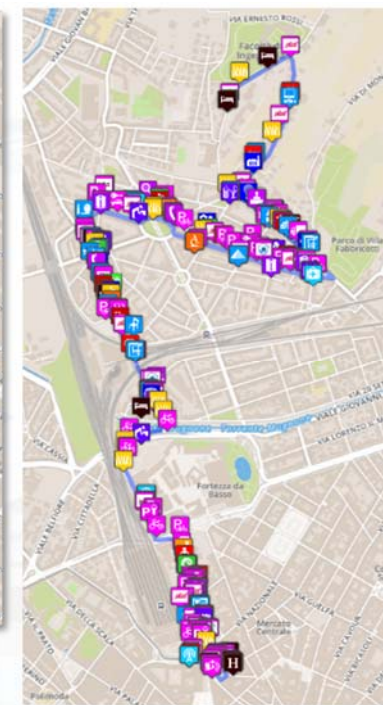


Each request or search in the Km4City model can be referred to a point and a ray, to an area, to a polyline

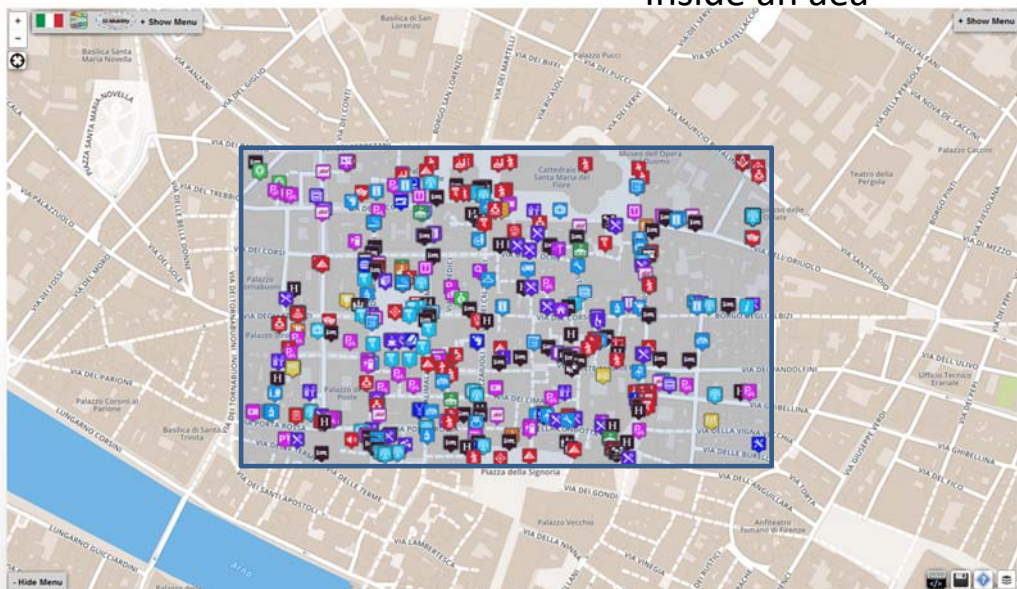
In a polyline



Along a polyline



Inside an area



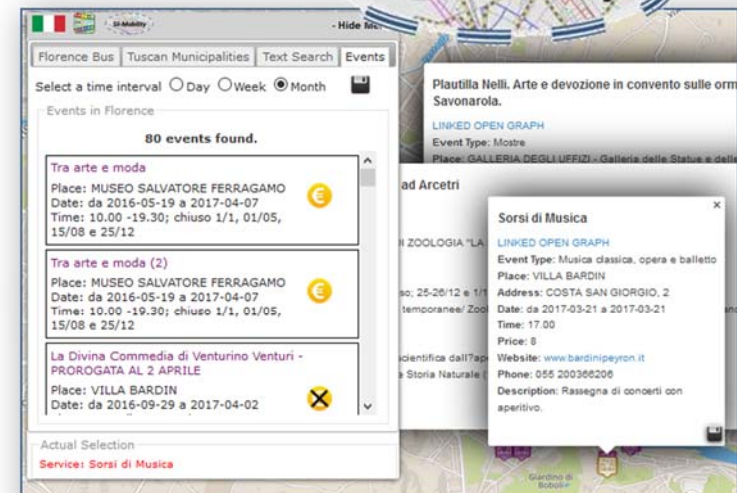
Empowering City Users

- Allow city users to
 - provide comments, images and scores associated with a certain Service (or place, via GPS)
 - Get list of last contributions of the same kind provided by other users
- They can be:
 - used as feedbacks
 - moderated by a back office personnel
 - ..
- In the future (→) connection with a more powerful server based on 311 standard would be possible



Access to Event information

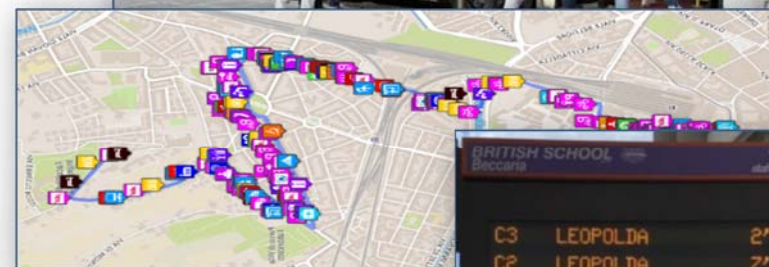
- Getting Events in the city
 - Theater, museum, show, sport, etc.
- Getting Event details
 - Event kind, and thus ordering
 - in the day, week, and month
 - Location, and thus ordering, or selecting events per area, per residence
 - General information
 - Opening and cost (if any)
 - Etc.



Supporting City Users in using Public Mobility

- **Public Transport, PT**

- Getting tickets
- Getting bus stops, lines, and timelines for bus, train and tramline
- Searching Services along a PT line or closer to a stop
- Searching the closest bus stops
- → searching for BUS stops via name
- → multimodal routing for Pub. Transport
- → real time delays of busses



Supporting City Users in using Private Mobility

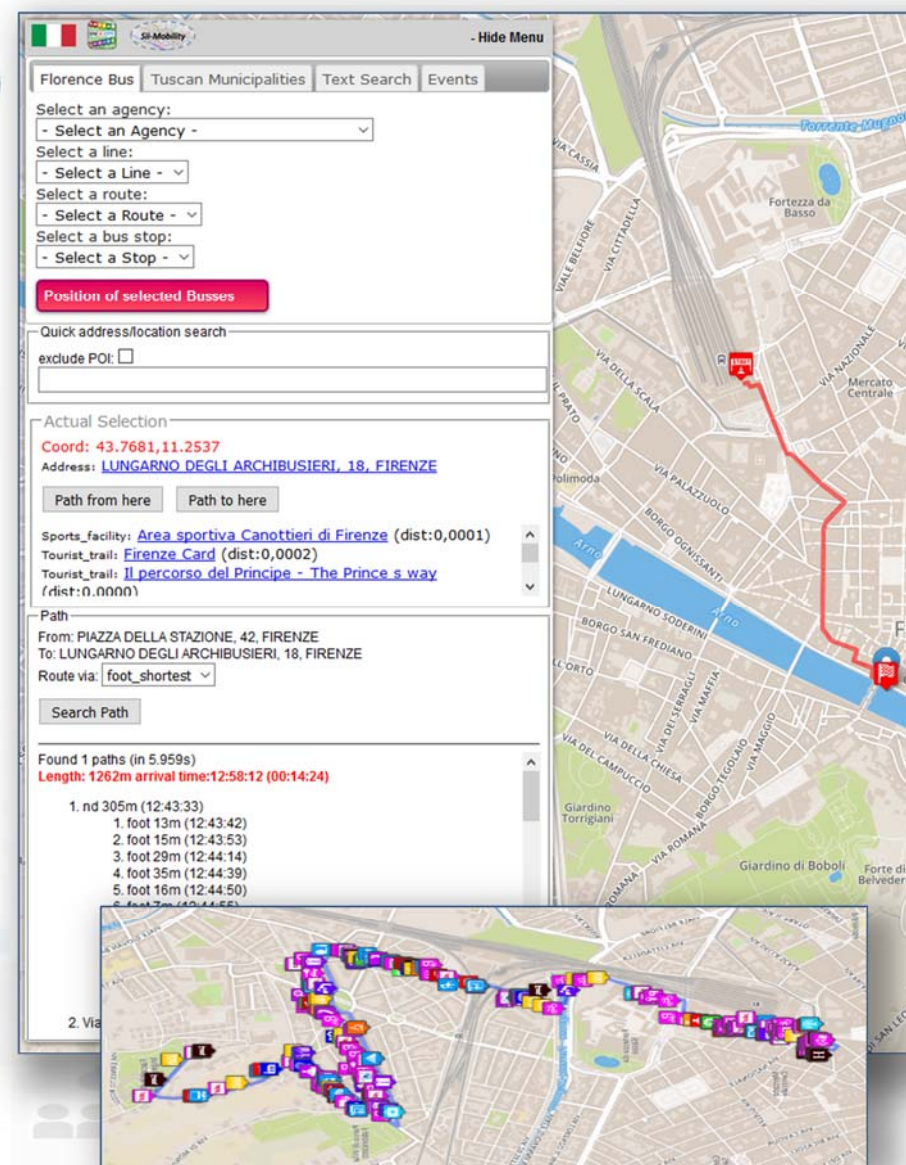
• Private Transport

- Getting closer parking
- Getting closer free space on parking
- Getting fuel stations location and prices
- Searching Services along a path or closer to a point or Service as Hotel, Restaurants, square, etc.
- Getting closer cycling paths
- → Recharging stations: location and status
- → Getting traffic information



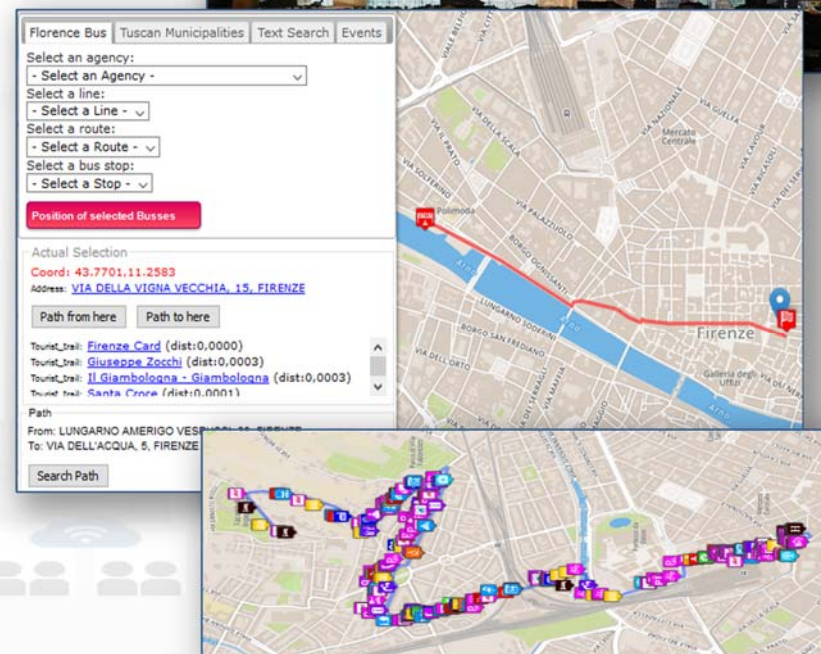
Private Mobility: routing and navigation paths

- To get the path from two points/POIs:
 - Shortest for pedestrian
 - Quietest for pedestrian
 - Shortest for private vehicles
- Search for POIs along the identified Path!
- <http://www.disit.org/ServiceMap>



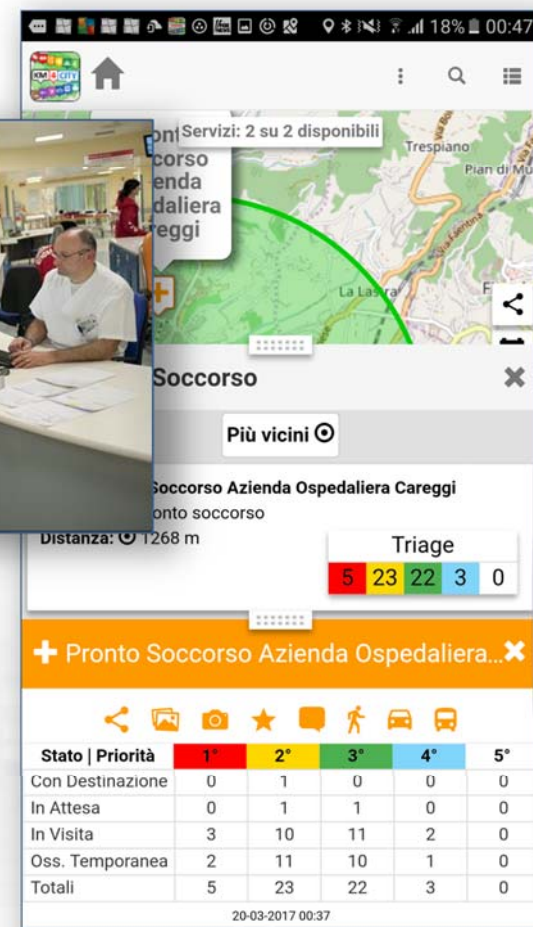
New Experience to access at Cultural and Touristic info

- Getting location and description of Point of Interests, POIs: culture and tourism first
 - Location, images, phone, URL, etc.
- Search for POIs in areas and closer
- Get routing to reach location or POI by walking downtown
 - searching Services along the path
- Search for location, full text assisted



New way to access at health services

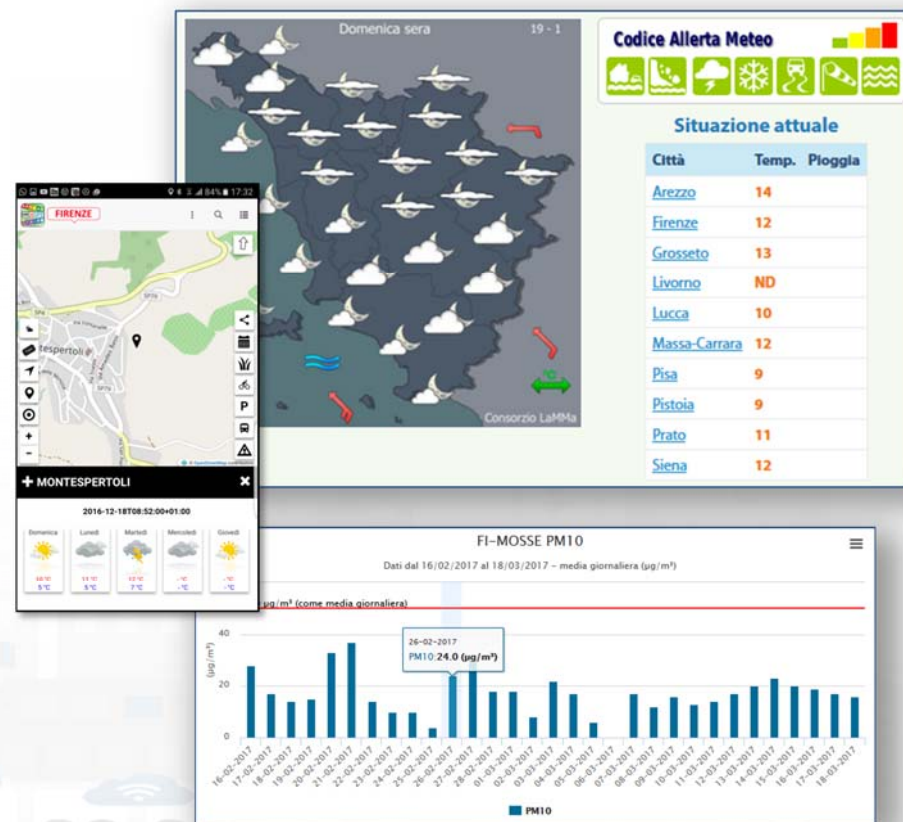
- Searching for pharmacies and hospitals
- Getting the closest hospital first aid locations and status
- Getting real time updated information about the first aid status of major hospitals (triage)



I CODICI DEL PRONTO SOCCORSO	
CODICE ROSSO EMERGENZA accesso immediato	Casi con pericolo di vita Il trattamento di questi pazienti avviene immediatamente in via prioritaria
CODICE GIALLO URGENZA accesso rapido	Casi con lesioni gravi ed eventuale alterazione di una o più funzioni vitali L'assistenza viene assicurata nel minor tempo possibile
CODICE VERDE URGENZA differibile	Casi in condizioni critiche, ma non in pericolo di vita L'assistenza viene assicurata dopo i casi più urgenti
CODICE AZZURRO NON URGENZA	Casi in condizioni non gravi La prestazione sanitaria è differibile
CODICE BIANCO	Casi con problematiche risolubili dal medico curante, dalla guardia medica o da ambulatori specialistici Tempi di attesa molto lunghi

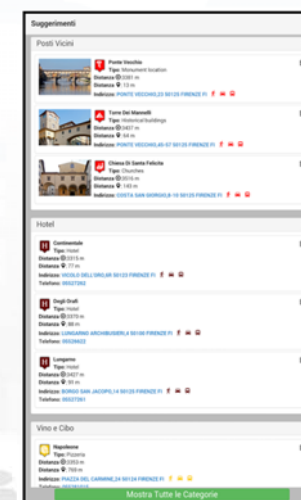
Access at Environmental information

- Getting weather forecast for the next days
- Getting alert information from Civil protection
- Getting air quality status
- → getting actual weather status: temperature, humidity, pressure, rain level, etc.



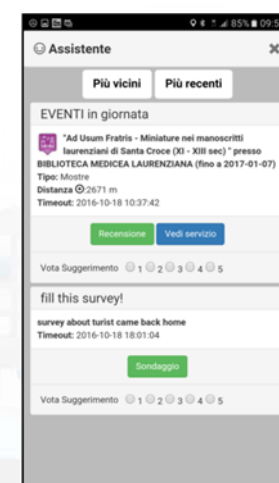
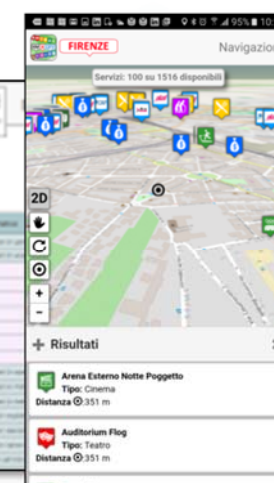
Profiled Suggestions to City Users

- Personalized suggestions
 - The server provide suggestions in the user context (location and time) arranged in a number of categories
 - Culture, mobility, food and drink, etc.
 - Alerts: civil protection, city council, twitter data, etc.
 - The city user may reject some of them, thus the suggestion engine learns about preferred topics and category



Profiled Engagements to City Users

- The user are profiled to learn habits:
 - Personal POI and paths
 - Mobility habits
- Information and engagements sent to the city users are programmed according to the user evolution to:
 - Stimulate virtuous habits
 - More sustainable habits
 - More healthy habits, etc.
 - Get feedbacks
 - Provide bonus and prices,
 - Send alerts,





Agenda 7 Aprile



- Overview progetto Sii-Mobility
- Presentazione del modello dati
- Come funziona l'hackathon
- Ingaggiare gli utenti con le App
- Scenari di uso ? (Nesi)
- Development tool, Info e documentazione (Paolucci)
- Presentazione delle smart city API (P. Bellini)
- Sviluppo di Moduli per App "Toscana dove cosa"

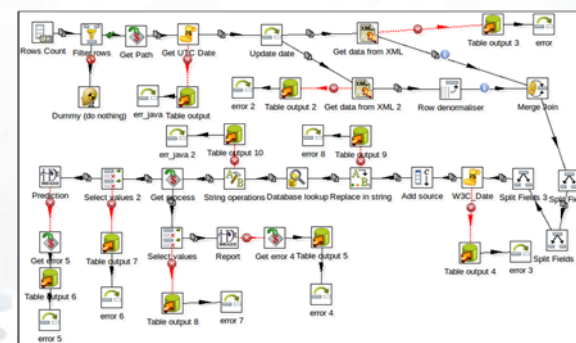
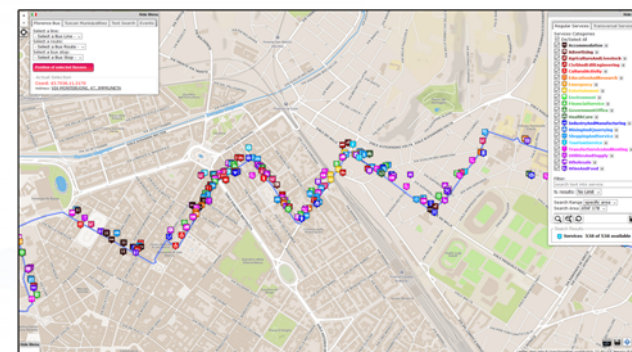


Development tools info and documentation

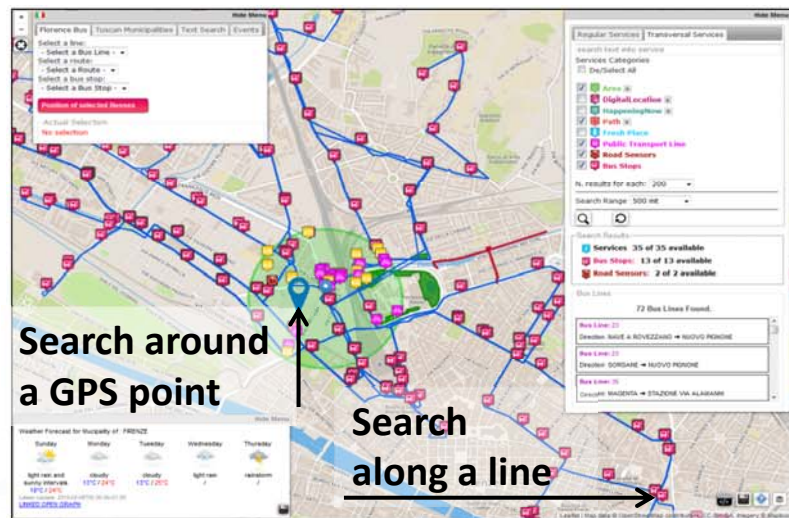


Development Tools

- **Smart City API:**
 - Several kind of APIs
- **Generator “ServiceMap”,**
<http://servicemap.km4city.org>
 - [Slides http://www.disit.org/6994](http://www.disit.org/6994)
 - Call per web and mobile App
 - Embedding in web pages
- **Load new data: manual and automatic**
 - POI, IOT, etc.
 - Load of Shape & Paths



ServiceMap Dev Tool

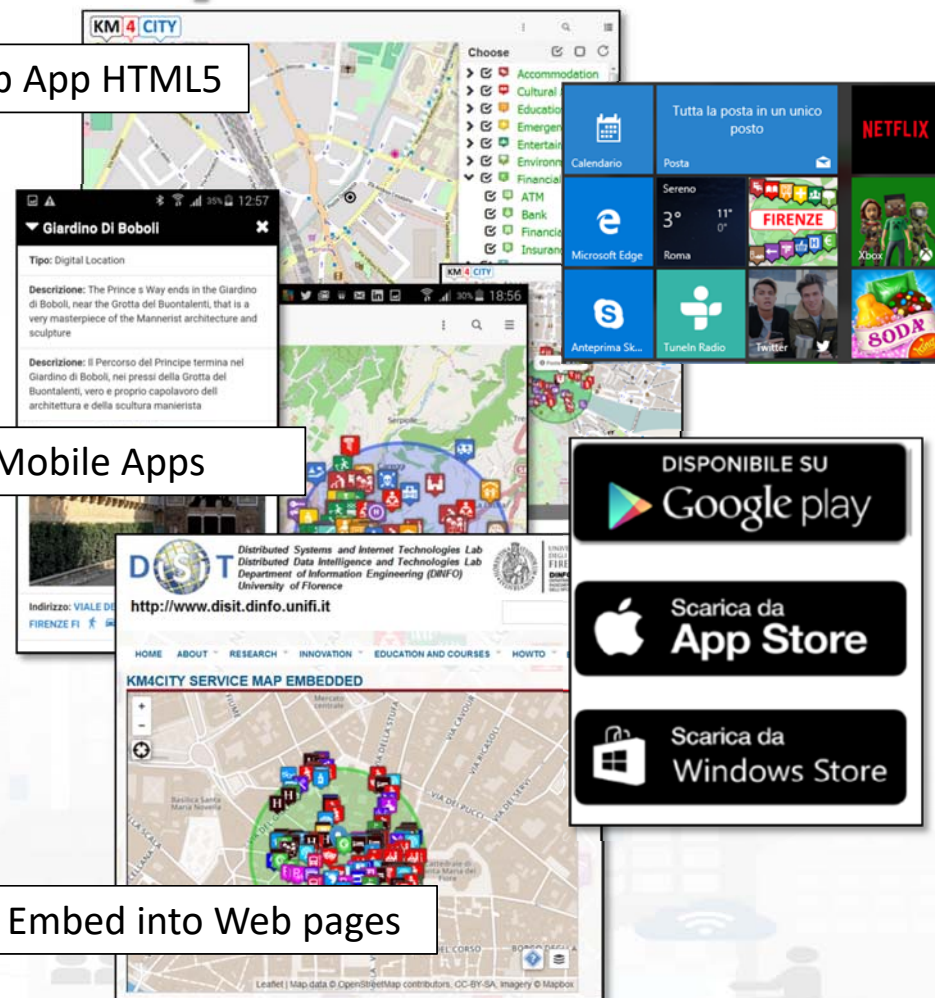


Smart City API call generation

Web App HTML5

Mobile Apps

Embed into Web pages



Smart City API

- <http://www.disit.org/6597>
 - REST API: serviceURI or Selection or GPS
 - REST API: Query ID
 - Receive an email
 - Get a JSON, HTML, ...
 - Call SPARQL
- EMBED facility in third party web pages
- Developers may use the ServiceMap tool to:
 - compose geographical and textual queries
 - THEN request an e-mail containing the calls (same results in JSON and/or in HTML)

FERMATA : STATUTO 04

LINKED OPEN GRAPH

Linee: 20 28 4 54 8

Prossimi transiti:

FERMATA : STAZIONE PENSILINA

LINKED OPEN GRAPH

Linee: 11 17 22 23 36 4 52 54 6

Prossimi transiti:

Orario	Linea	Stato	Ride
13:01:40	4	In orario	5084813
13:05:04	17	Ritardo	4933186
13:07:24	6	In orario	4829621
13:09:02	17	In orario	4848688
13:12:02	6	Anticipo	4867907
13:12:20	6	In orario	4829654

Save your information for services.

You can save this service on ServiceMap. Please insert a valid e-mail, and you will receive a link that could allow you to access at the results and share it with your friends.

Insert your e-mail: email@domain.ext

Insert a title: Service title

Insert a description: Insert a description

Send

Save your information for services.

You can save this query on ServiceMap. Please insert a valid e-mail, and you will receive a link that could allow you to access at the results and share it with your friends.

Insert your e-mail: michela.paolucci@unifi.it

Insert a title: My Query

Insert a description: Busses available at Florence station

Send



Linked Open Graph

log.disit.org/service/?graph=df5b4f67f01b7d96071475d62068e0fe

Linked Open Graph

SiiMobility (by DISIT)

Examples:

- VIA GIACOMO MATTEOTTI
- Bagno a ripoli
- Florence

Choose a class:

Search for keyword

keyword:

uri: Request

Your data

sparql endpoint: (optional)

uri: Request

Status

Requests:

Remove Clear

Type of relations

Select all Deselect all Invert Hide all inverse

<input checked="" type="checkbox"/> belongTo	<input checked="" type="checkbox"/> coincideWith
<input checked="" type="checkbox"/> contains	<input checked="" type="checkbox"/> depiction
<input checked="" type="checkbox"/> ends	<input checked="" type="checkbox"/> forming
<input checked="" type="checkbox"/> has	<input checked="" type="checkbox"/> hasAccess
<input checked="" type="checkbox"/> hasExternalAccess	<input checked="" type="checkbox"/> hasMunicipality
<input checked="" type="checkbox"/> hasProvince	<input checked="" type="checkbox"/> hasRule
<input checked="" type="checkbox"/> hasStreetNumber	<input checked="" type="checkbox"/> inMunicipalityOf
<input checked="" type="checkbox"/> isIn	<input checked="" type="checkbox"/> isPartOf
<input checked="" type="checkbox"/> isPartOfProvince	<input checked="" type="checkbox"/> isPartOfRegion
<input checked="" type="checkbox"/> managingAuthority	<input checked="" type="checkbox"/> ownerAuthority
<input checked="" type="checkbox"/> placedIn	<input type="checkbox"/> sameAs
<input checked="" type="checkbox"/> seeAlso	<input type="checkbox"/> starts

Linked Open Graph

museo ferragamo

Relations of Museo Ferragamo with the road graph

Browsing the knowledge base
Linked Open Graph
<http://log.disit.org>

<http://log.disit.org/spqlquery/>

Flint SPARQL Editor 1.0.3

New Edit View Help

Dataset **KM4CITY** Mode **SPARQL 1.1 Query** Output **SPARQL/XML** **Submit**

Query 1

```

1 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
3
4 SELECT * WHERE {
5   ?s ?p ?o
6 }
7 LIMIT 10

```

All municipalities

Select all municipalities names.

```

PREFIX km4cr: <http://www.disit.org/km4city/schema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
SELECT * WHERE {
  ?s a km4cr:Municipality;
  rdfs:label ?l.
} ORDER BY ?l

```

Bus stops near the Florence SMN train station

The bus stops within 100m of the Firenze SMN

```

PREFIX km4cr: <http://www.disit.org/km4city/schema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

```

Line 1: Position 1; Copy; Cancel

Query Results

#	s	p	o
1	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
2	http://www.w3.org/2000/01/rdf-schema#subPropertyOf	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
3	http://www.w3.org/2000/01/rdf-schema#subClassOf	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
4	http://www.w3.org/2000/01/rdf-schema#domain	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
5	http://www.w3.org/2000/01/rdf-schema#range	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property
6	http://www.w3.org/2002/07/owl#equivalentProperty	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://www.w3.org/1999/02/22-rdf-syntax-ns#Property

Querying the knowledge base in SPARQL

(a) How to Legally work with App (dev) Kit



(a) Licenze of App (dev) KIT

- **Sii-Mobility is Open Source GPL on GitHub as DISIT lab:**
 - <https://github.com/disit>
- **Sii-Mobility App Kit**
 - Affero Open Source GPL, ver.3.0
 - has a limited coverage of features with respect to the whole «Toscana dove cosa ..» Apps
 - can be only used to develop additional App Modules that CAN be integrated to the main «xxxxxx dove cosa ..» Apps family by DISIT Lab
- **Mobile App «Toscana dove cosa ..» is**
 - available for cities that would like to develop their version of «xxxxxx dove cosa» App Family, published by DISIT Lab
- Smart City API can be used for developing proprietary Apps

Info and Documents





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Documentation



- **Development of Sii-Mobility App modules tutorial**
 - <http://www.sii-mobility.org/index.php/eventi/mobile-app-workshop>
- **Documentation Smart City API, version 1, January 2017**
 - <http://www.disit.org/6991> (document from Sii-Mobility), <http://www.disit.org/6995>
- **App Kit development page:**
 - <http://www.disit.org/6977> (slides ready, and video) <http://www.disit.org/6992>
 - Servicemao: <http://www.disit.org/6994>
- **Ontology and Km4City Tools:**
 - [Http://www.km4city.org](http://www.km4city.org)
 - <http://www.disit.org/6506> Ontology and documentation
- **Sii-Mobility is Open Source on GitHub as DISIT lab:**
 - <https://github.com/disit>
 - <https://github.com/disit/siiMobilityAppKit> (mobile App kit)
- **Data Ingestion processes and tools, tutorial:**
 - <http://www.sii-mobility.org/index.php/documentazione/slide-e-altro>
 - <http://www.disit.org/6690>
- **Deliverables of Sii-Mobility:**
 - <http://www.sii-mobility.org/index.php/documentazione/deliverable>
- **FAQ of Sii-Mobility:**
 - <http://www.sii-mobility.org/index.php/il-progetto/faq>
- **Promotional Kit for «Toscana dove cosa App»**
 - <http://www.sii-mobility.org/index.php/documentazione/kit-promozionale-app-toscana>



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Open Source



Km4City, Sii-Mobility, RESOLUTE, REPLICATE: smart city big data open source tools. Km4City is a knowledge base and a research line of DISIT lab mainly developed before the start of Sii-Mobility, RESOLUTE, REPLICATE projects. While it has been mainly improved by them. Those projects are complementar each other and almost all of them use and contribute the Km4City research line. **ServiceMap smart city knowledge base tool**: smart city service tool (mainly developed for Sii-Mobility project) for accessing to km4city knowledge base, for service browsing and query, for **Smart City API** for mobile and for mobile development tool, <http://www.disit.org/km4city>

- Open Source on DISIT: <http://www.disit.org/6763>
- GITHUB: <https://github.com/disit>

Roadmap

2013

Km4City 1.1

- Tuscany Map
- Services
- AVM
- Sensors
- Parking
- Cultural Heritage
- Enrichment cities
- Event in the city
- Digital Locations
- Fresh places

- <http://servicemap.km4city.org> API
- <http://log.disit.org>
- <http://www.disit.org/fodd>
- <http://www.disit.org/tv> Twitter Vigilance
- <http://smartds.km4city.org>

2014

- Weather
- Cultural Heritage
- Energy recharge pillar
- Wi-Fi
- Events in the city

2015

Km4City 1.4

- Embed
- More API
- iBeacon



Km4City 1.5

- SmartDS
- Km4City App



RESOLUTE H2020
2015-2018 - Started

Sii-Mobility SCN
2016-2018 - Started
Km4City 1.6.2

2016

REPLICATE H2020
2016-2021- Started



- Suggestions on demand
- User Behaviour Analysis
- Trajectories and OD

2021

12/2017

- Territorial areas and paths
- Health, Bike sharing
- Statistics, Energy, ICT, ...
- E-vehicles

6/2017

- Risk analysis
- Environmental, water
- Data Licensing models
- Energy Meters
- Fi-Ware compliant

Today

- More Sensors, IOE, IOT
- Dashboard Builder
- Territorial areas and paths
- User Engagement
- Mobility and transport
- Resilience Decision Support

GHOST SIR
2016-2019 - Started



Acknowledgement

- Thanks to the European Commission for founding. All slides reporting logo of **RESOLUTE H2020** are representing tools and research founded by European Commission for the RESOLUTE project. **RESOLUTE** has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement n° 653460).
- Thanks to the European Commission for founding. All slides reporting logo of **REPLICATE H2020** are representing tools and research founded by European Commission for the REPLICATE project. **REPLICATE** has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement n° 691735).
- Thanks to the MIUR for co-founding and to the University of Florence and companies involved. All slides reporting logo of **Sii-Mobility** are representing tools and research founded by MIUR for the Sii-Mobility SCN MIUR project.
- **Km4City** is an open technology exploited by those projects and line of research of DISIT Lab. Some of the innovative solutions and research issues developed into the above mentioned projects are also compliant and contributing to the Km4City approach and thus are contributing to the open Km4City model of DISIT lab.





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