



# Via Regina: using FOSS4G for slow tourism

Maria Antonia Brovelli, Massimiliano Cannata, Marco Minghini,  
Marco Negretti and Giorgio Zamboni



# The paths of Via Regina project

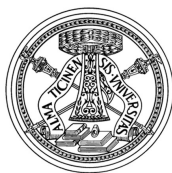
INTERREG project (Cross-border Co-operation Operational Programme Italy - Switzerland 2007-2013)



POLITECNICO  
DI MILANO

Scuola universitaria professionale  
della Svizzera italiana

**SUPSI**



MU. V.I.S  
Museo della Via Spluga  
e della Val San Giacomo



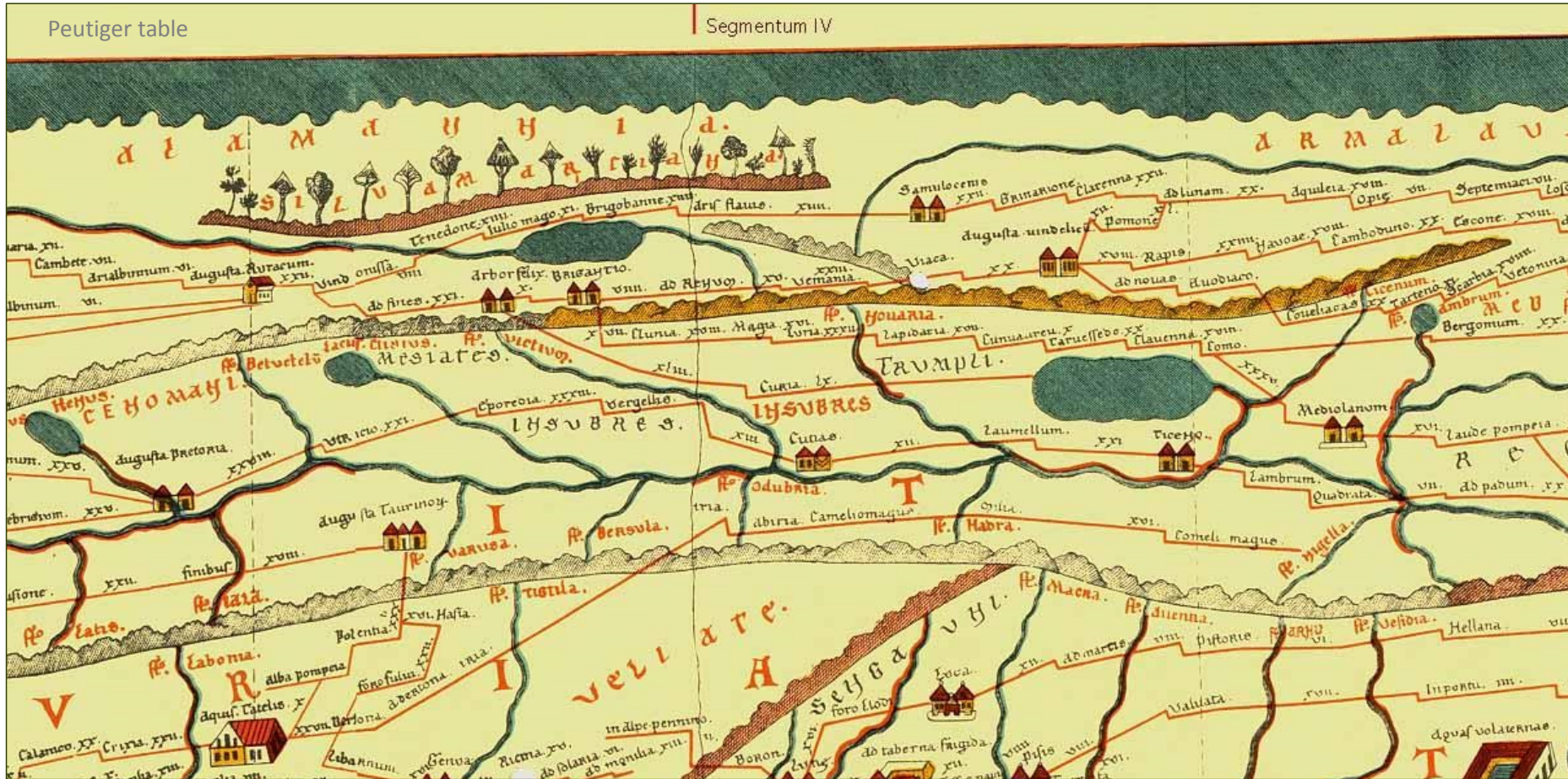
# Aims

- Valorization of the territory and cultural heritage through the preservation and enhancement of the available historical paths
- Use of geospatial technology for disseminating knowledge, protecting the natural resources and promoting tourism thanks to the environmental and cultural wealth of the territory
- Development and implementation of innovative technological tools such as:
  - ➔ multidimensional visualization
  - ➔ participation
  - ➔ augmented reality





# What is Via Regina?







# What is Via Regina?

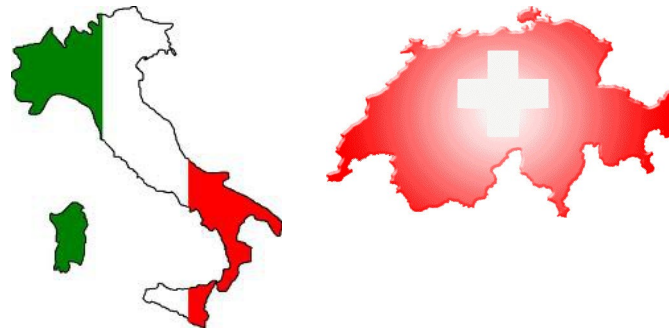
It represents a fundamental transalpine system of **soft** mobility links especially for slow tourism





# Authoritative Data

- Regional Map (scale 1:10 000 - 1:25 000)
- Digital Terrain Models (DTMs) res. 2 m; 20 m
- Town Maps at scale 1:1 000 - 1:5 000
- Maps of path networks
- Maps of thematic paths
- Aerial images
- National maps
- Historical maps
- Hiking trails
- Geological Atlases
- Inventory historical routes
- Land cover

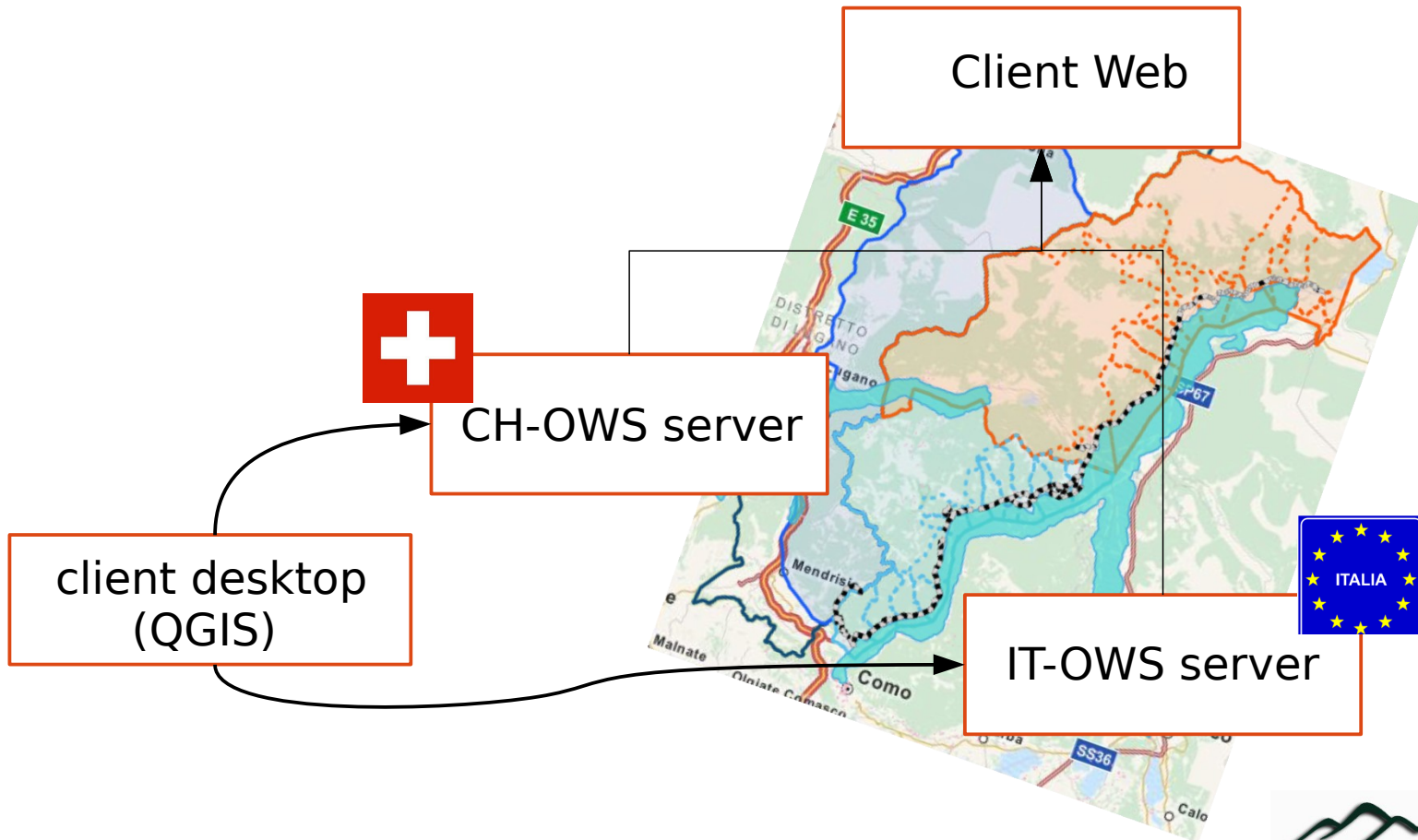


# Open Problems/ solutions

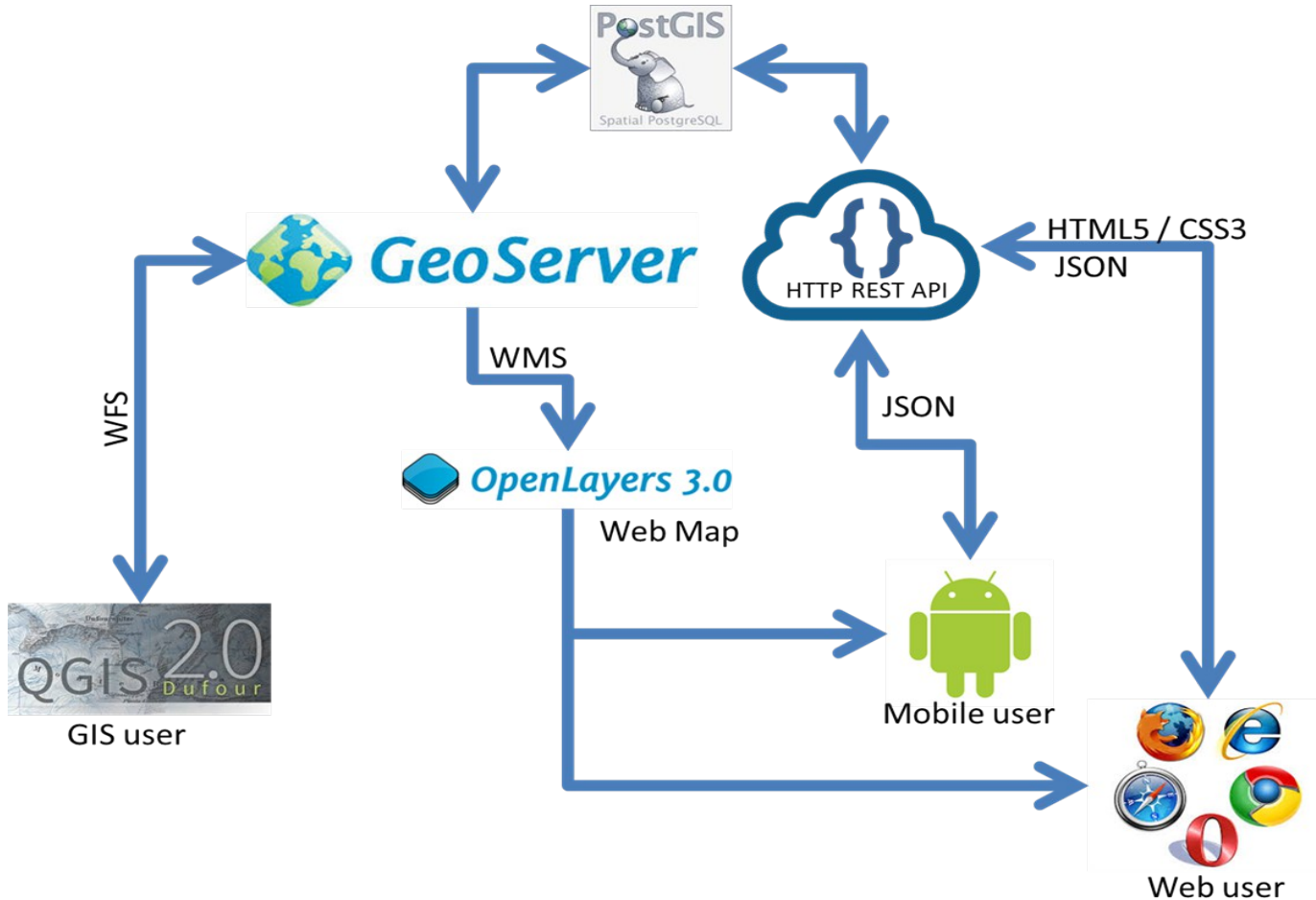
- Reference systems, projections, models
  - Geo-Services
- Data License
  - Italian data are open and available free of charge
  - Swiss data must be paid
  - Openstreetmap



# General Architecture



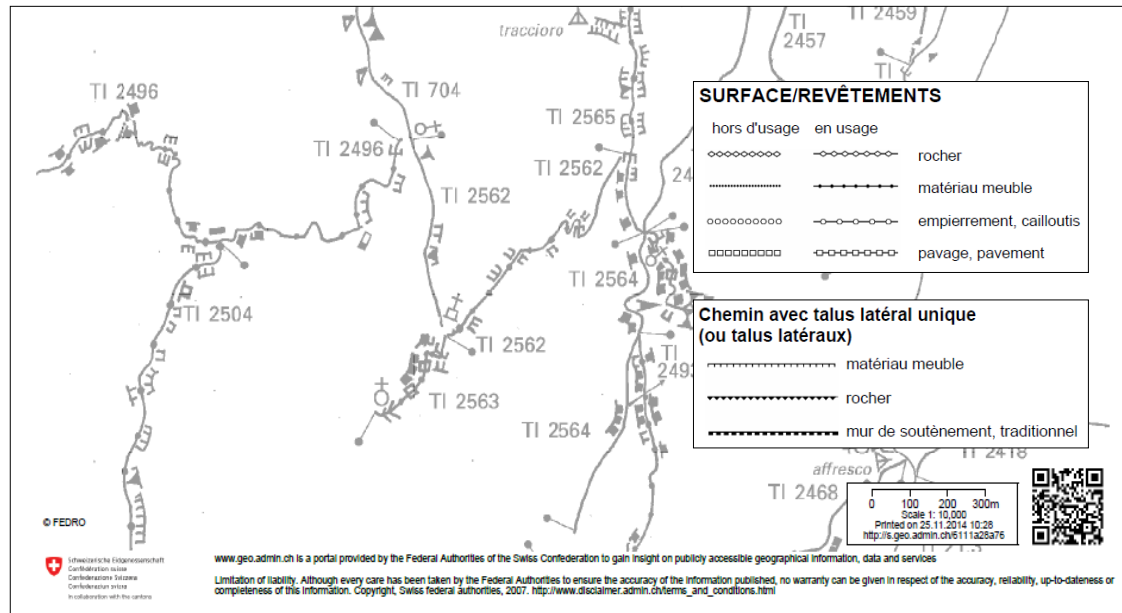
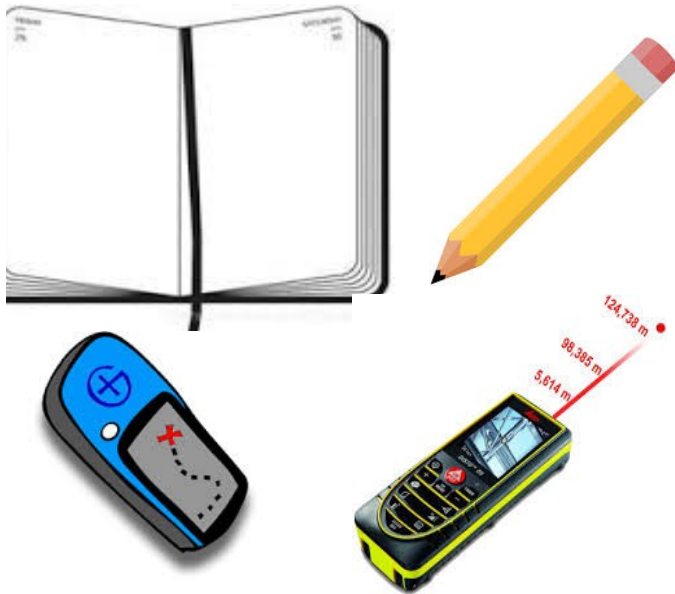
# CH-OWS architecture





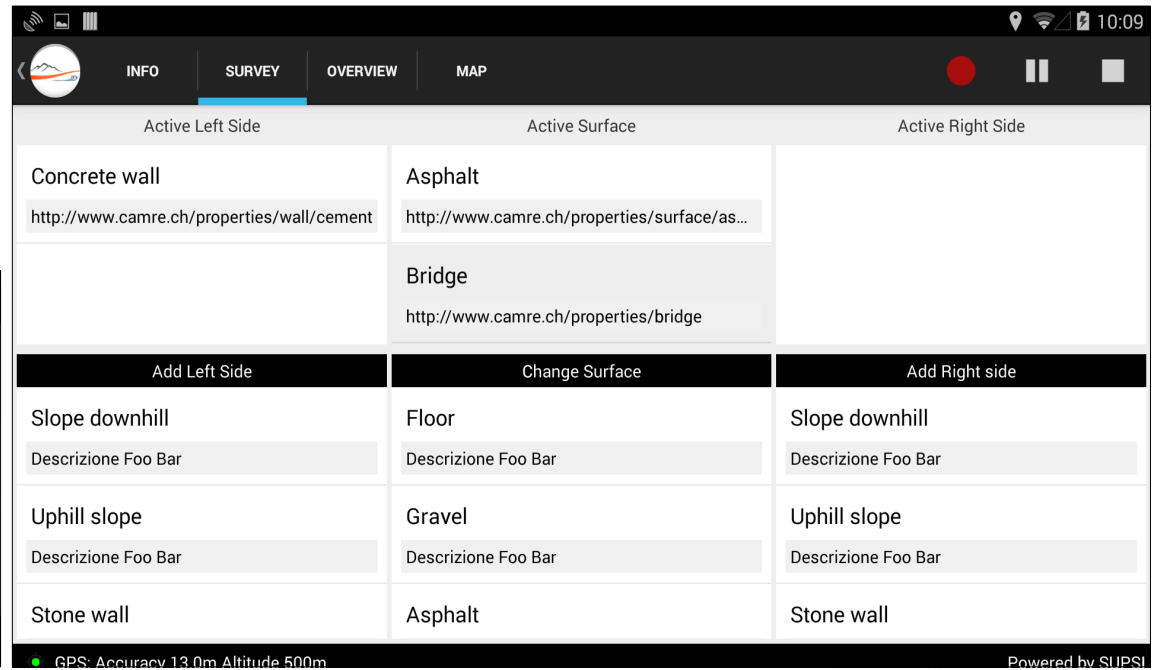
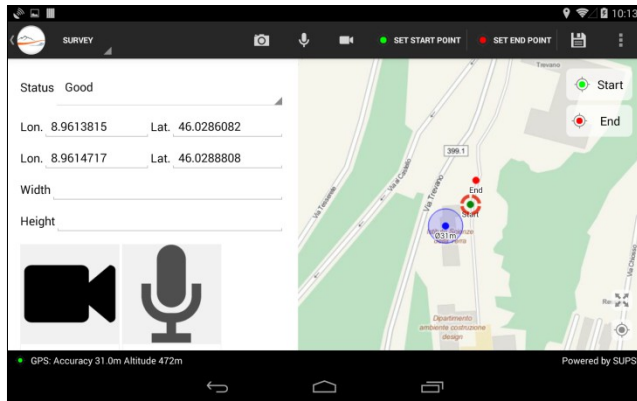
# The inventory of historical routes

- ❖ Consolidated Swiss procedure for mapping historical routes and characteristic elements: used for landuse planning as they are considered historical heritage
  - Completely handwork without any support



# Path survey with Android

- ❖ Developed in Java with AndroidStudio using Android SDK and JTS topology suite
- ❖ JSON object are locally stored and will be sent to a python webservice.

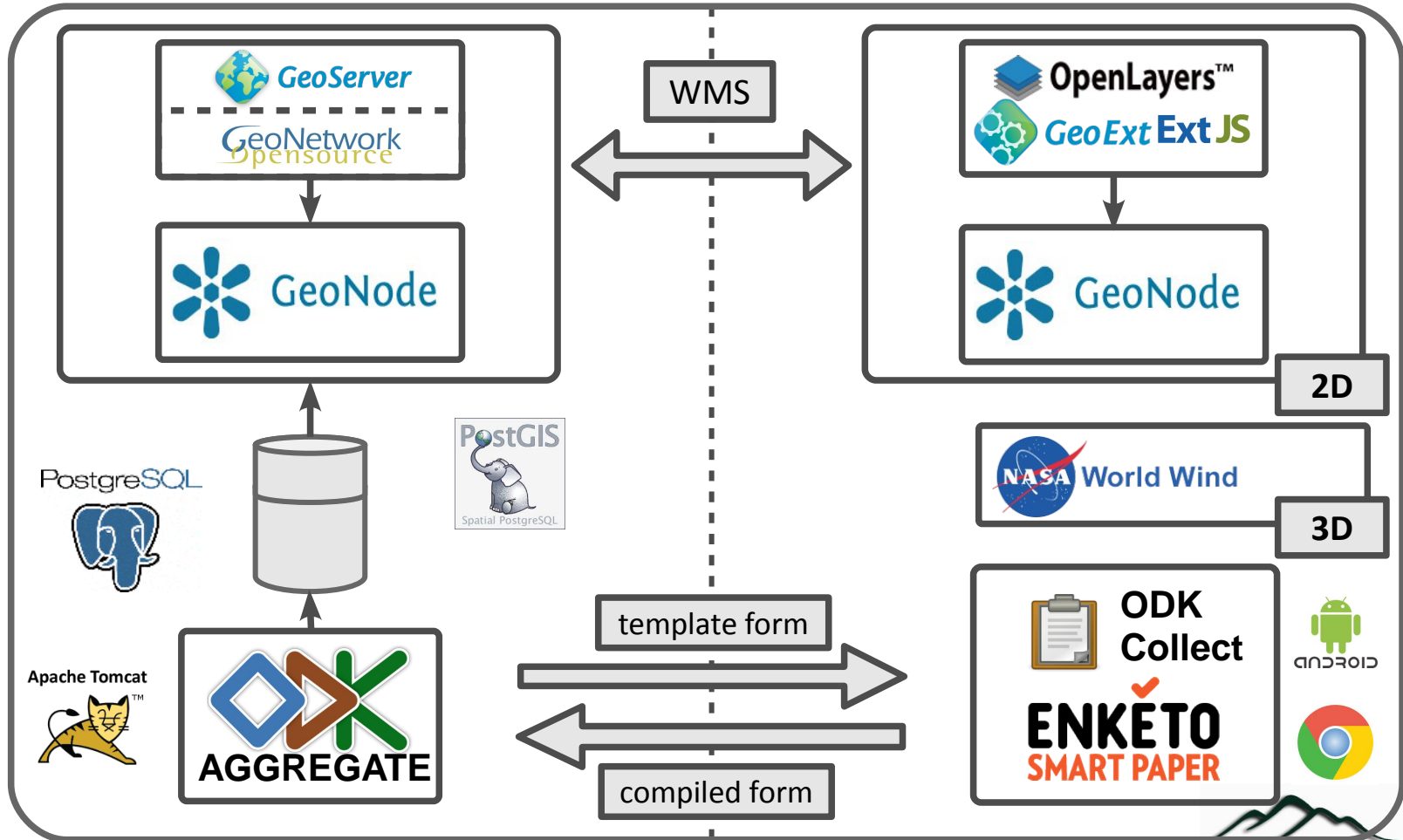




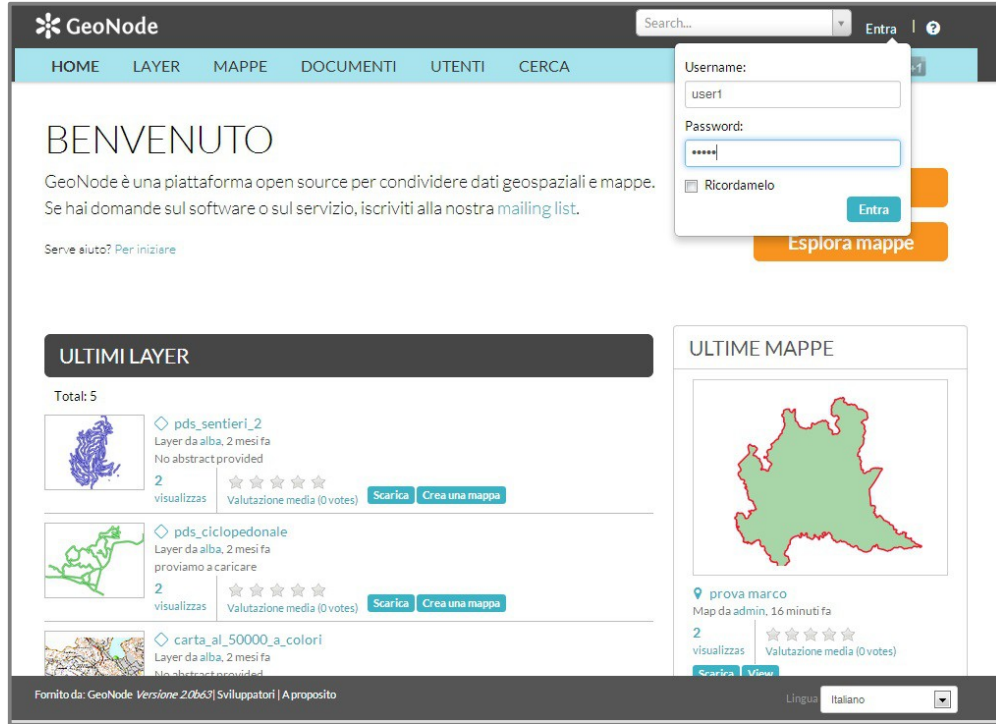
# IT-OWS architecture

**SERVER**

**CLIENT**



# Data sharing tools for local administrations



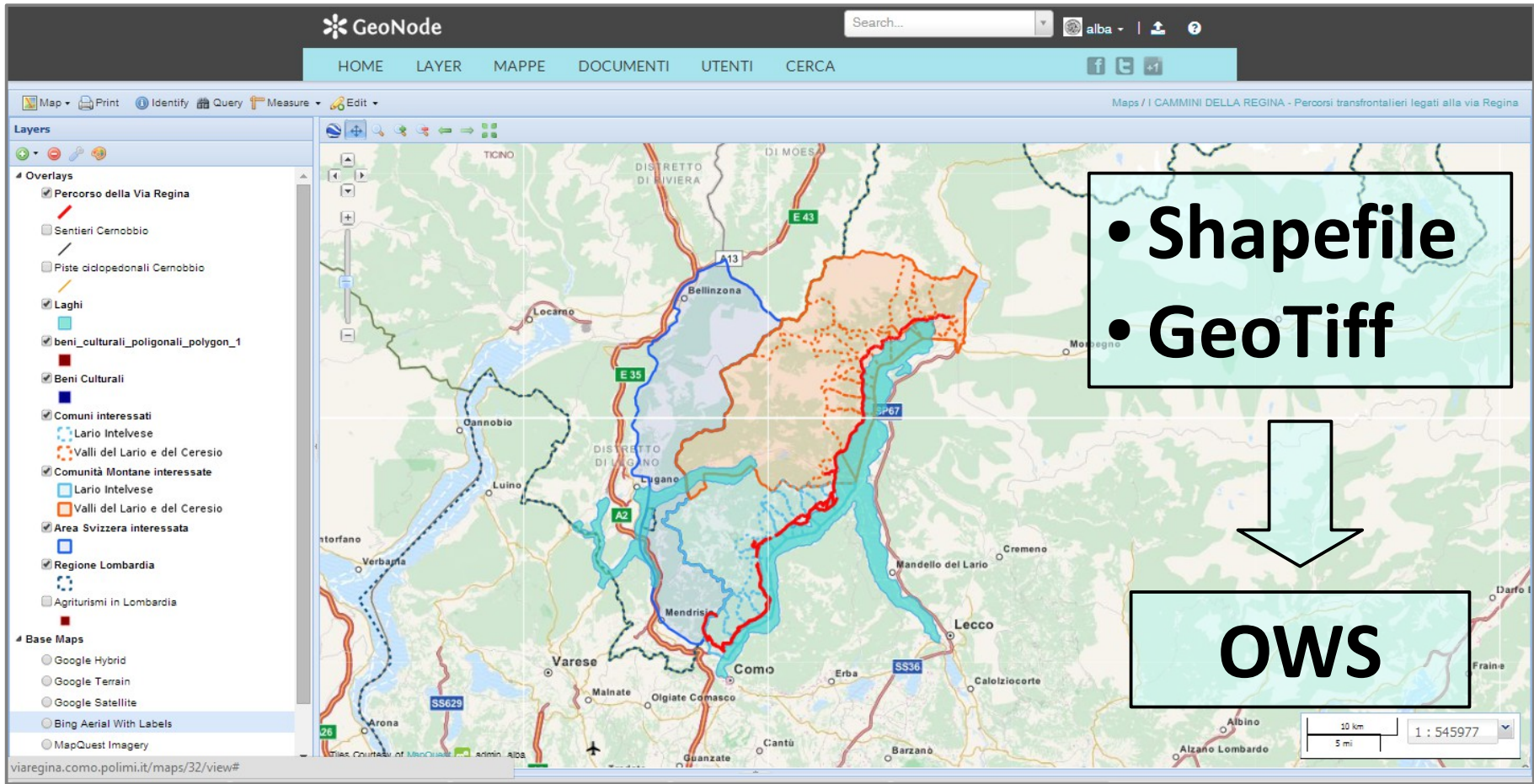
Open source platform for:

- creation
- management
- publication
- sharing

of interactive maps and  
geospatial information.

Usable also by non expert users.

# Data sharing tools for local administrations



GeoNode

HOME LAYER MAPPE DOCUMENTI UTENTI CERCA

Search...

alba

Layers

- Overlays
  - ☒ Percorso della Via Regina
  - ☐ Sentieri Cernobbio
  - ☐ Piste ciclopedonali Cernobbio
  - ☒ Laghi
  - ☒ beni\_culturali\_poligonal\_polygon\_1
  - ☒ Beni Culturali
  - ☒ Comuni interessati
    - ☐ Lario Intelvese
    - ☐ Valli del Lario e del Ceresio
  - ☒ Comunità Montane interessate
    - ☐ Lario Intelvese
    - ☐ Valli del Lario e del Ceresio
  - ☒ Area Svizzera interessata
  - ☒ Regione Lombardia
  - ☐ Agriturismo in Lombardia
- Base Maps
  - ☐ Google Hybrid
  - ☐ Google Terrain
  - ☐ Google Satellite
  - ☐ Bing Aerial With Labels
  - ☐ MapQuest Imagery

viaregina.como.polimi.it/maps/32/view#

Maps / I CAMMINI DELLA REGINA - Percorsi transfrontalieri legati alla via Regina

• Shapefile

• GeoTiff

OWS



# Data sharing tools for citizen



- ➔ Suite providing a set of tools for managing mobile data collection
- <http://opendatakit.org>
  - **free and open source** under Apache2 license
  - developed by University of Washington - Department of Computer Science & Engineering

# Data sharing tools for citizen

## ➤ form authoring tools:

- **ODK Build**: graphical drag-and-drop tool for creating simple forms
- **XLSForm**: form design via Excel spreadsheet

## ➤ ODK Collect:

- Android app for filling forms (which can contain multimedia and locations)

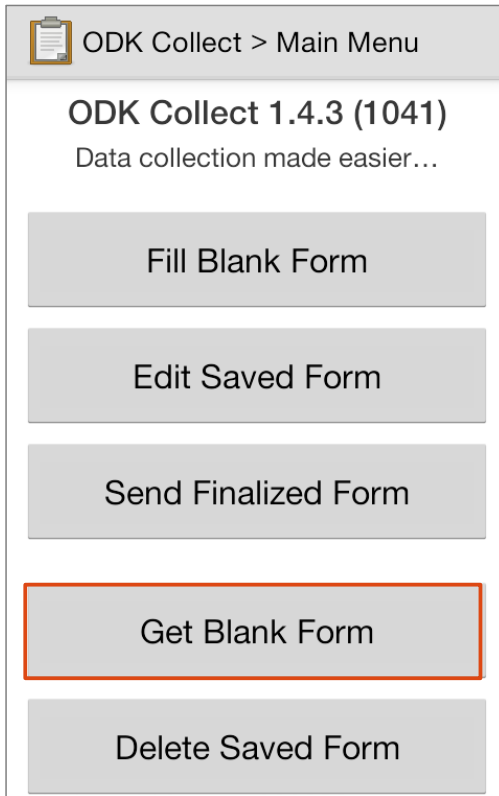
## ➤ ODK Aggregate:

- repository of the data sent by ODK Collect
- can run in the cloud, on a virtual machine or on a private server (i.e. a Tomcat server backed with a PostgreSQL database)

# Data sharing tools: ODK Collect

✓ Application main menu

✓ Download of form template



ODK Collect > Main Menu

ODK Collect 1.4.3 (1041)  
Data collection made easier...


Fill Blank Form

Edit Saved Form

Send Finalized Form

Get Blank Form

Delete Saved Form



ODK Collect > Get Blank Form

I Cammini della Regina ☒

ID: regina\_v9

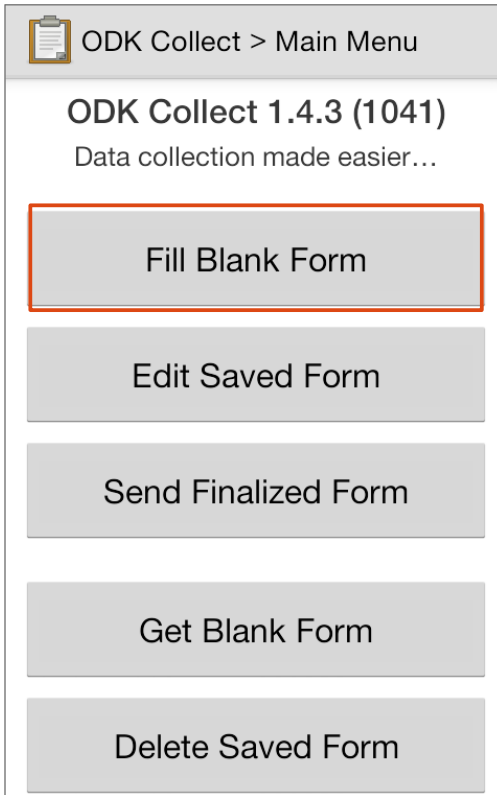
Toggle All Refresh Get Selected



# Data sharing tools: ODK Collect

✓ Application main menu

✓ Guided form compilation



ODK Collect > Main Menu

ODK Collect 1.4.3 (1041)  
Data collection made easier...

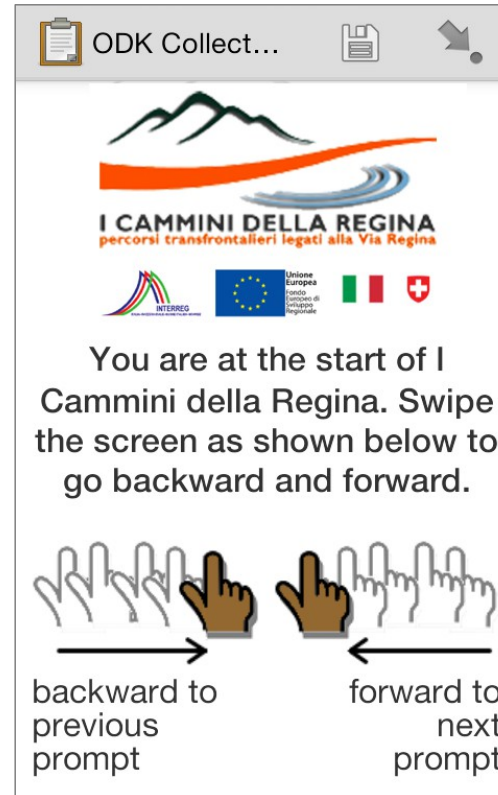
Fill Blank Form

Edit Saved Form


Send Finalized Form

Get Blank Form

Delete Saved Form




ODK Collect...

  
I CAMMINI DELLA REGINA  
percorsi transfrontalieri legati alla Via Regina

Un logo con montagne e una linea ondulata.

Un logo con montagne e una linea ondulata.

You are at the start of I  
Cammini della Regina. Swipe  
the screen as shown below to  
go backward and forward.



backward to  
previous  
prompt

forward to  
next  
prompt

# Data sharing tools: ODK Collect

## ✓ Guided form compilation

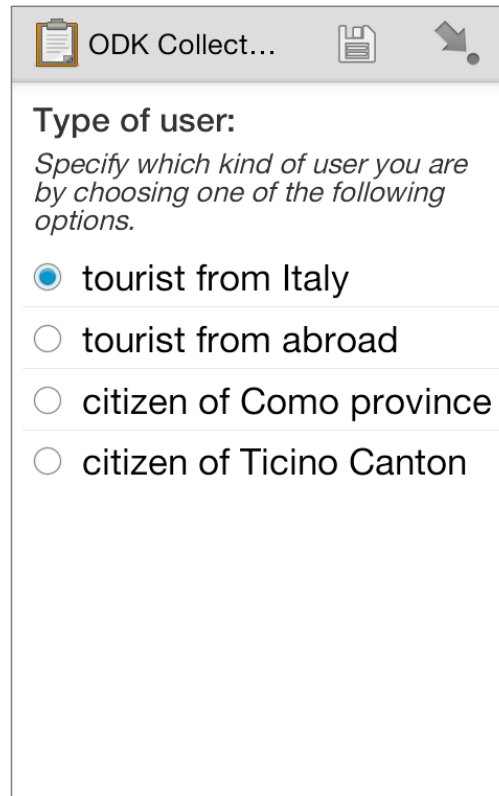


ODK Collect...

Date of report

Aprile 2014

D	L	M	M	G	V	S
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10

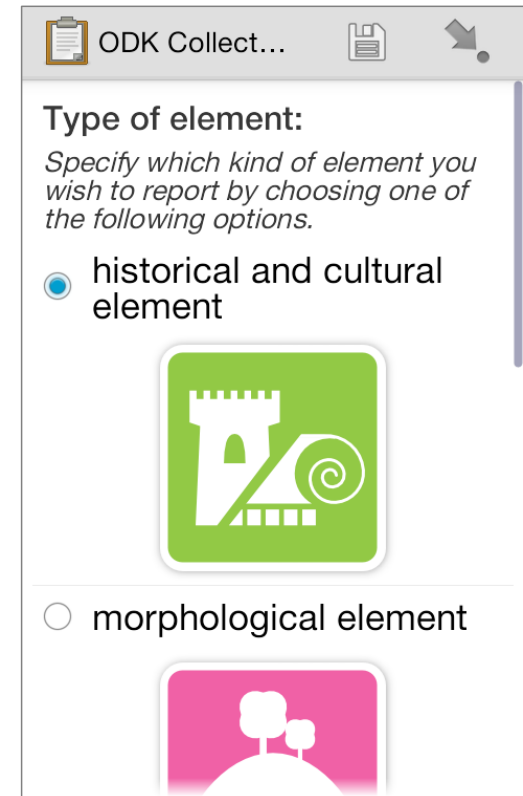


ODK Collect...

Type of user:

*Specify which kind of user you are by choosing one of the following options.*

- ☒ tourist from Italy
- ☐ tourist from abroad
- ☐ citizen of Como province
- ☐ citizen of Ticino Canton



ODK Collect...

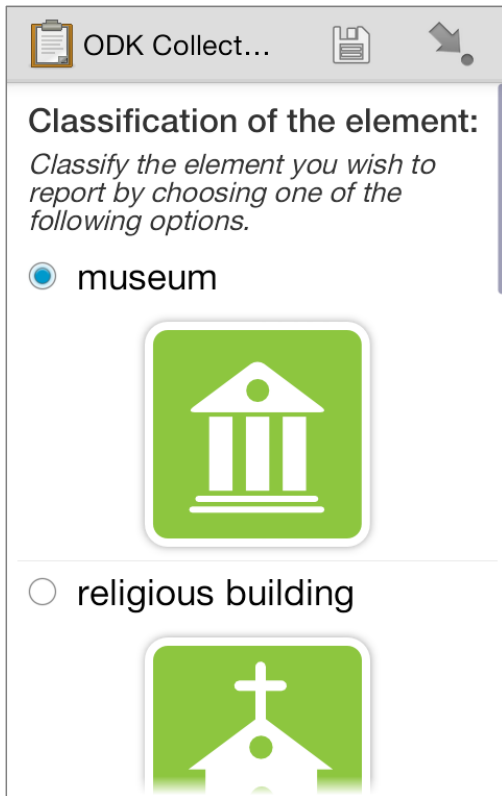
Type of element:

*Specify which kind of element you wish to report by choosing one of the following options.*

- ☒ historical and cultural element
- ☐ morphological element

# Data sharing tools: ODK Collect


## ✓ Guided form compilation



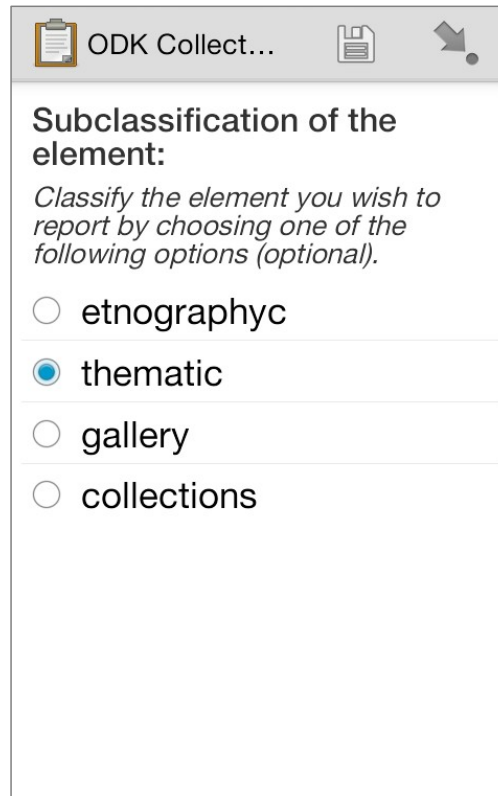

ODK Collect...

**Classification of the element:**  
*Classify the element you wish to report by choosing one of the following options.*

☒ museum



☐ religious building



ODK Collect...

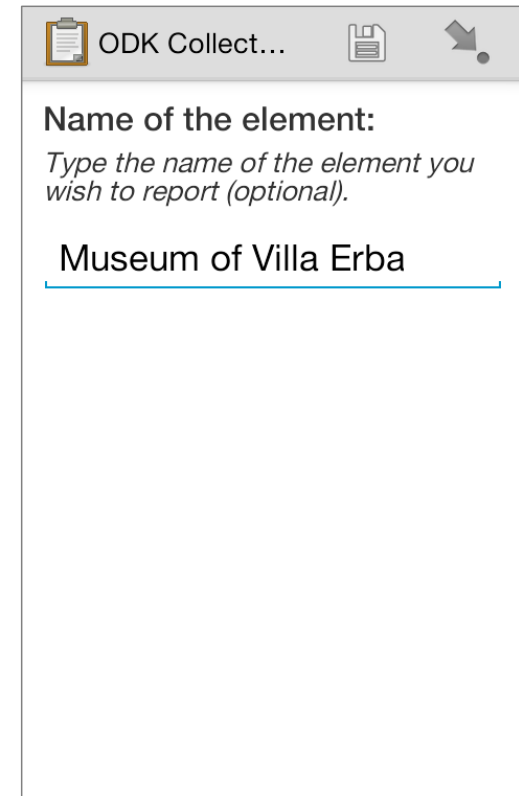
**Subclassification of the element:**  
*Classify the element you wish to report by choosing one of the following options (optional).*

☐ ethnographyc

☒ thematic

☐ gallery

☐ collections



ODK Collect...

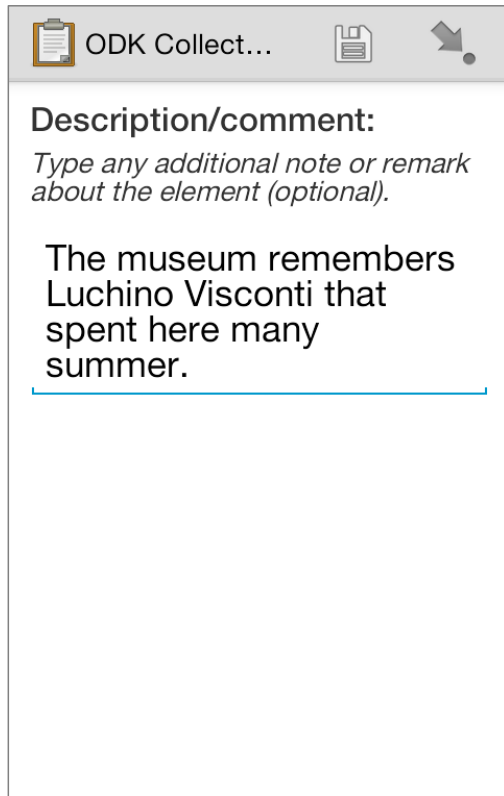
**Name of the element:**  
*Type the name of the element you wish to report (optional).*

Museum of Villa Erba



# Data sharing tools: ODK Collect

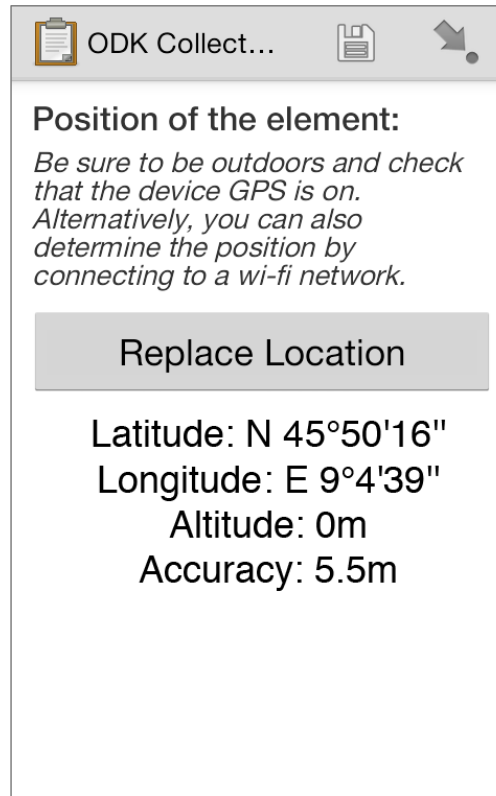
## ✓ Guided form compilation



ODK Collect...

**Description/comment:**  
*Type any additional note or remark about the element (optional).*

The museum remembers Luchino Visconti that spent here many summer.

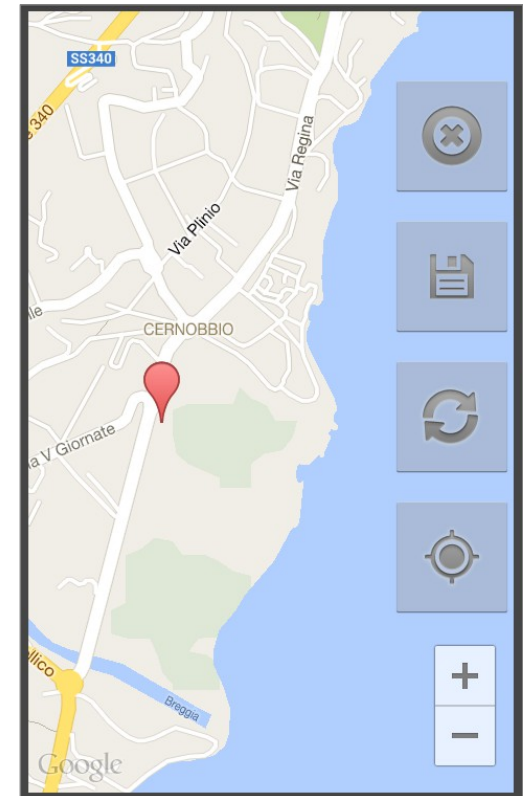


ODK Collect...

**Position of the element:**  
*Be sure to be outdoors and check that the device GPS is on. Alternatively, you can also determine the position by connecting to a wi-fi network.*

Replace Location

Latitude: N 45°50'16"  
Longitude: E 9°4'39"  
Altitude: 0m  
Accuracy: 5.5m



# Data sharing tools: ODK Collect


## ✓ Guided form compilation

ODK Collect...

**Picture showing the element:**  
*Take a picture of the element using the device camera or upload a picture available on the device.*

Take Picture

Choose Image



ODK Collect...

**Record audio:**  
*Record or upload an audio using your device (optional).*

Record Sound

Choose Sound

Play Sound

ODK Collect...

**Capture video:**  
*Capture or upload a video using your device (optional).*

Record Video

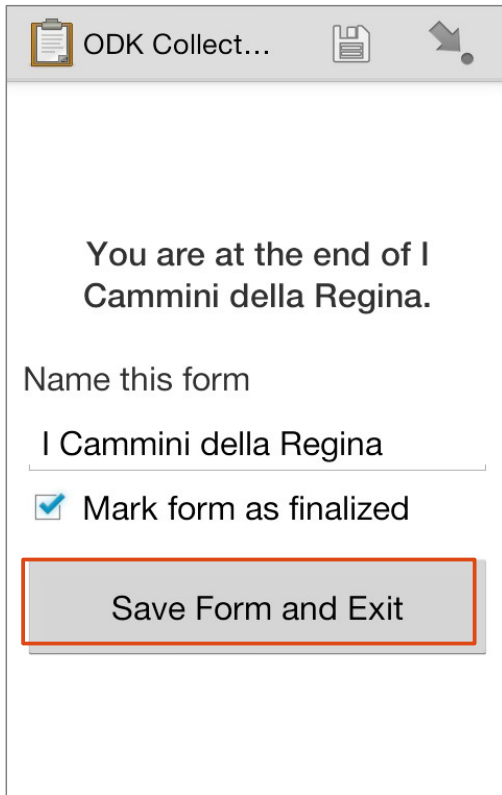
Choose Video

Play Video

# Data sharing tools: ODK Collect

✓ Guided form compilation

✓ Application main menu



ODK Collect...

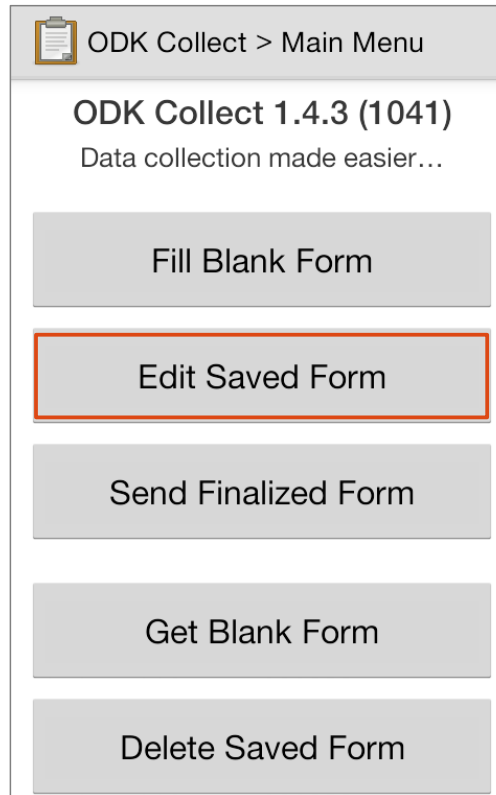
You are at the end of I Cammini della Regina.

Name this form

I Cammini della Regina

☒ Mark form as finalized

Save Form and Exit



ODK Collect > Main Menu

ODK Collect 1.4.3 (1041)  
Data collection made easier...

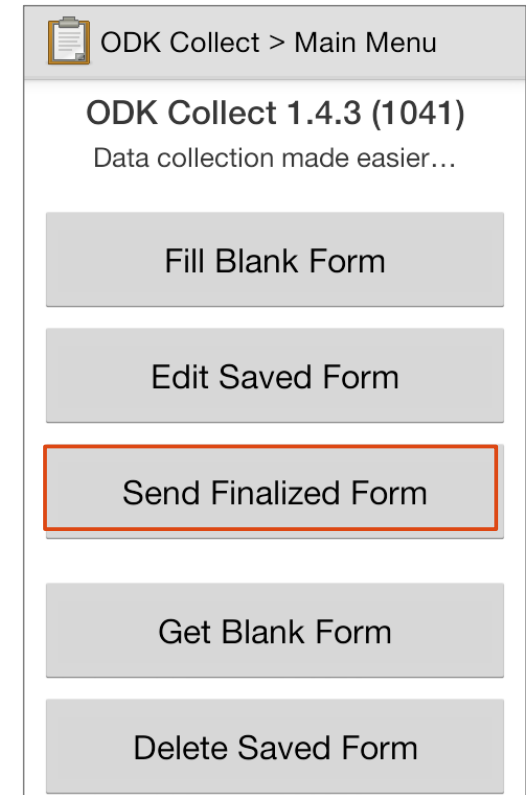
Fill Blank Form

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ODK Collect > Main Menu

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Get Blank Form

Delete Saved Form



SATURDAY MAY 3 2014

# MapParty!



WALK, OBSERVE, DRAW, MAP ALONG THE VIA REGINA  
FOR A CULTURAL, SENSORY AND PLAYFUL EXPERIENCE

Stories on the road between Italy and Switzerland with the Brigata dei novellatori senza frontiere





# MapParty!

3 MAGGIO 2014



CN25 © swisstopo



<http://viaregina.como.polimi.it/mapparty>



The screenshot shows the MapParty! web application interface. The browser address bar displays [viaregina.como.polimi.it/mapparty/](http://viaregina.como.polimi.it/mapparty/). The page header features the title "MapParty! 3 MAGGIO 2014" and a row of icons representing various map features: a shoe, a puzzle piece, a camera, a location pin, and a notepad.

On the left, a "Legenda" (Legend) panel lists categories and their corresponding symbols:

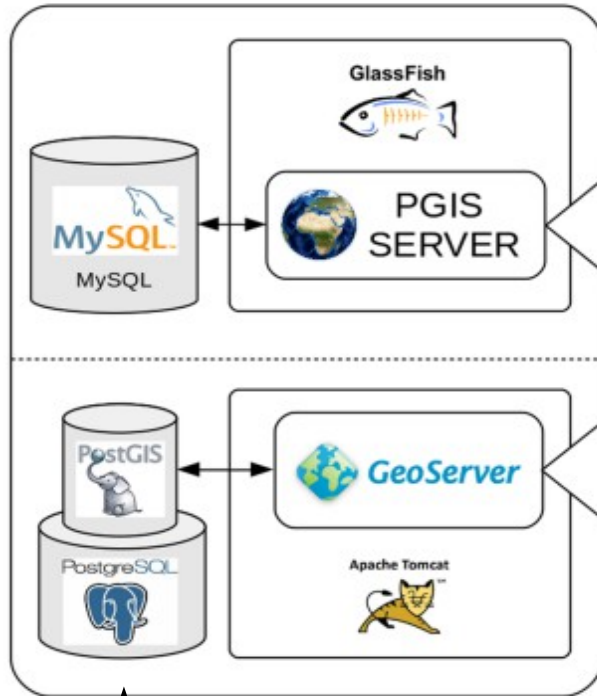
- Mappe di base
- Dati amministrativi
  - Area svizzera del progetto
  - Comune di Cernobbio
- Elementi naturali
  - Aree boschive
  - Aree verdi
  - Aree di pascolo
  - Fiumi
- Elementi antropici
  - Edifici
  - Patrimonio architettonico
- Map Party 03/05/2014
  - Percorso
- Punti segnalati
  - Elemento storico-culturale
  - Elemento morfologico
  - Elemento turistico
  - Elemento critico
  - Segnalazione

The main map area shows a topographic map of the Cernobbio area. A pop-up window titled "Map party - Punto segnalato" is displayed over the map, showing the following details:

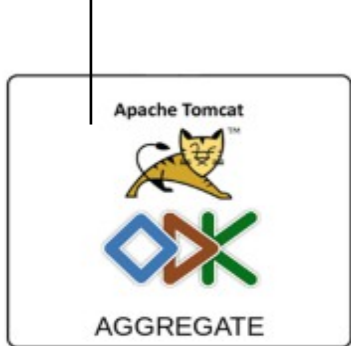
- Data: 11/04/2014
- Tipologia di utente: turista italiano
- Nome dell'elemento: undefined
- Tipologia dell'elemento: elemento turistico
- Classificazione dell'elemento: servizi
- Sottoclassificazione dell'elemento: fonte

The pop-up also includes a small photograph of a stone structure, likely a well or fountain. The map interface includes a scale bar (200 m, 1000 ft), a scale of 1:14K, and coordinates (lon: 9.0619, lat: 45.8438). The bottom right corner of the map area credits "OpenStreetMap contributors".

## SERVER



## CLIENT




# PoliCrowd2.0

In addition to the WMS servers, PoliCrowd 2.0 has also the innovative capability to directly connect with any Open Data Kit (ODK) server available on the network and publish the related data collected by the community




# Policrowd2.0



*A Social World Wind Platform*

Developer Team

- ★ Giorgio Zamboni (Mentor)
- ★ Luca Poddigue
- ★ Andrés Quiñones

 POLITECNICO  
DI MILANO

Polo Territoriale di Como

This research has been funded by the INTERREG “I cammini della Regina – Percorsi Transfrontalieri legati alla Via Regina (The paths of Regina – Crossborder paths departing from Via Regina)” 2007-2013 project.

# Thanks for your attention!

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[maria.brovelli@polimi.it](mailto:maria.brovelli@polimi.it)