



THE PATHS OF REGINA

Promoting slow tourism through FOSS4G Web
Mapping: an Italian-Swiss case study

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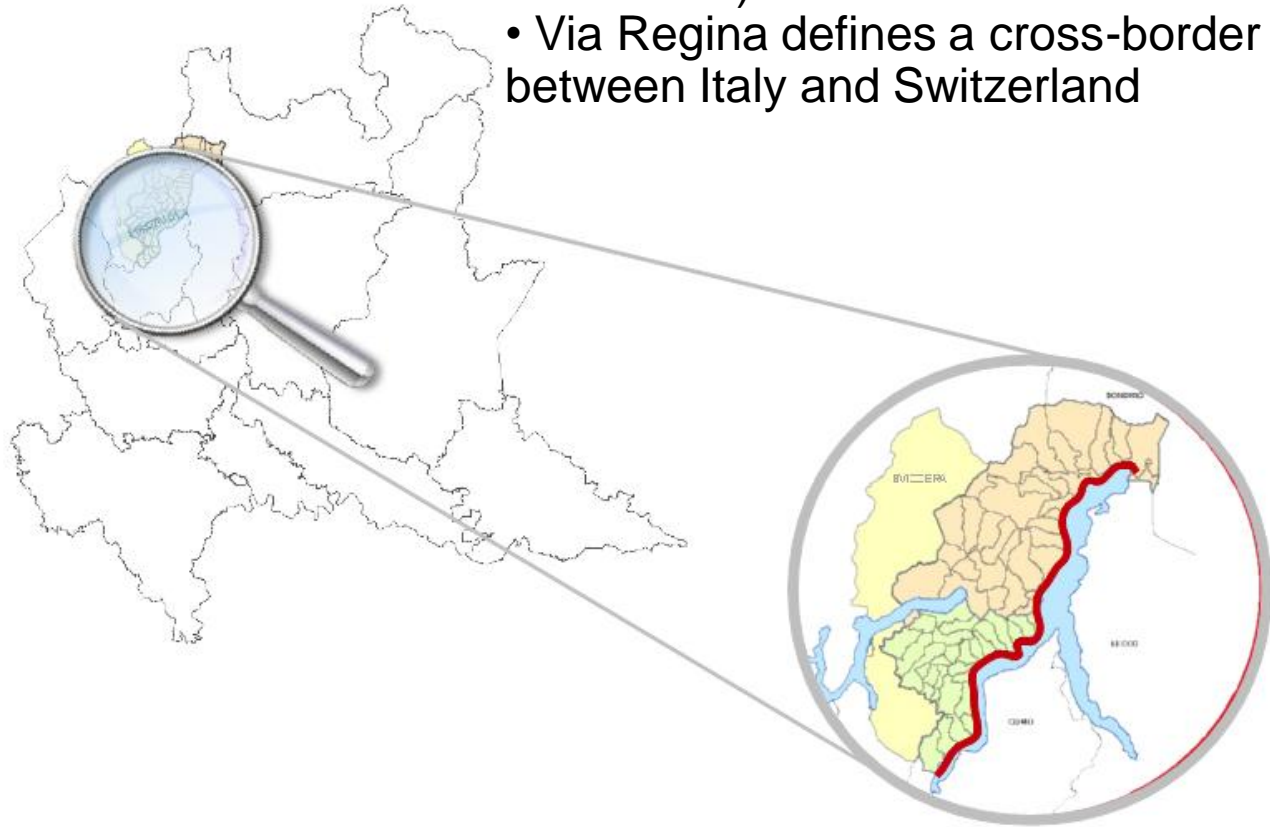
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² Politecnico di Milano, Como Campus, DICA, Via Valleggio 11, 22100, Como, Italy

The Paths of Regina

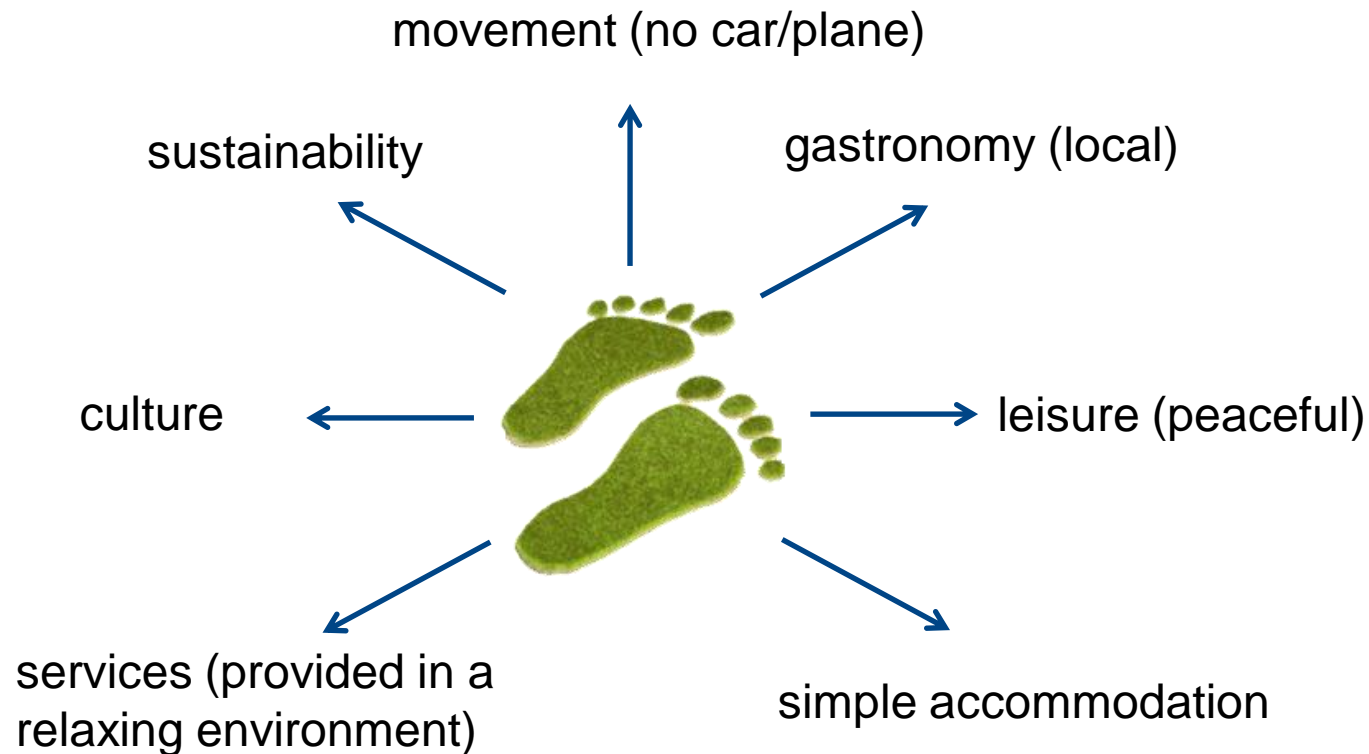


- *The Paths of Regina* is an INTERREG project (Cross-border Cooperation Operational Programme Italy-Switzerland 2007-2013)
- Via Regina defines a cross-border area between Italy and Switzerland



The Paths of Regina

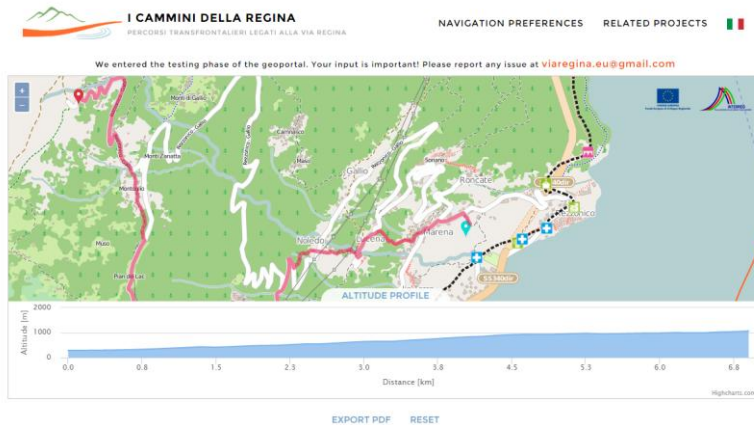
- Slow tourism (a special kind of sustainable tourism) involves:
 - environmental friendliness
 - rediscovery of local traditions and cultural knowledge



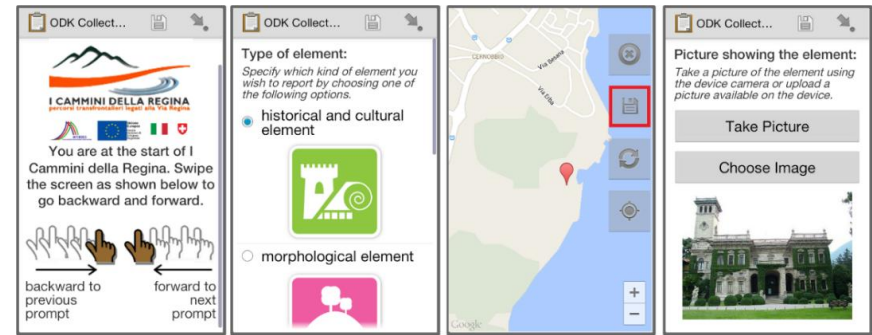
The Paths of Regina

- Within the project 5 applications have been developed:

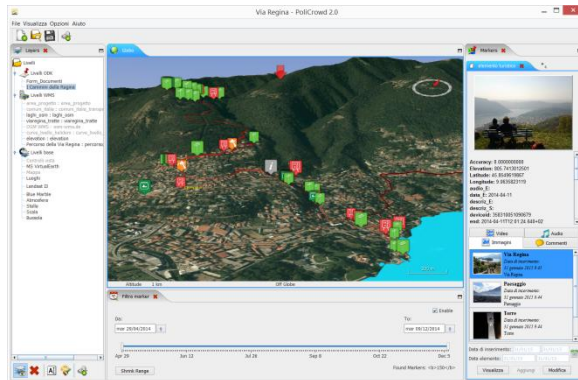
2D Web viewer



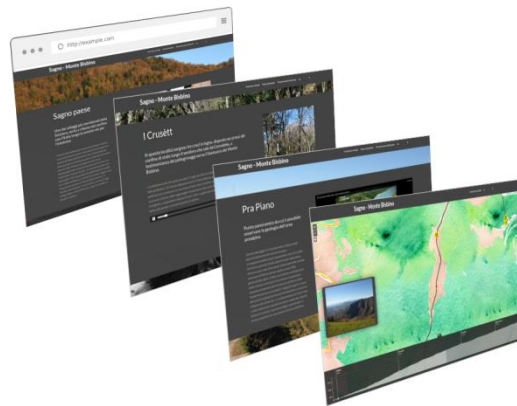
Mobile app for slow tourists



3D Web Viewer



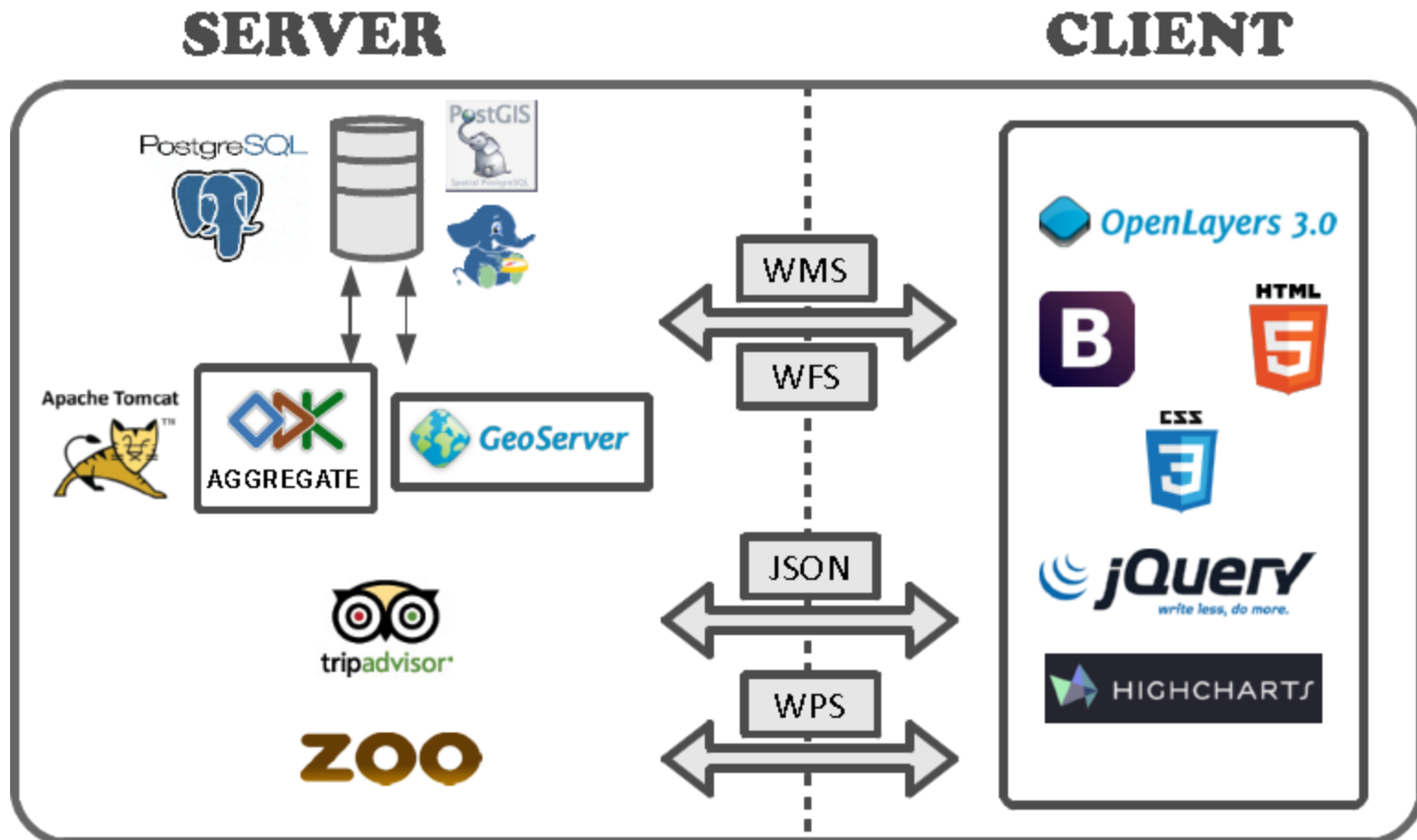
Virtual tour application



Mobile app for professionals



2D Web viewer



- Link: <http://viaregina3.como.polimi.it/ViaRegina/>

2D Web viewer

- Main 2D viewer of the project with advanced functionalities:
 - Calculation of the route based on user input about the types of POIs



**I CAMMINI DELLA REGINA**
PERCORSI TRANSFRONTALIERI LEGATI ALLA VIA REGINA

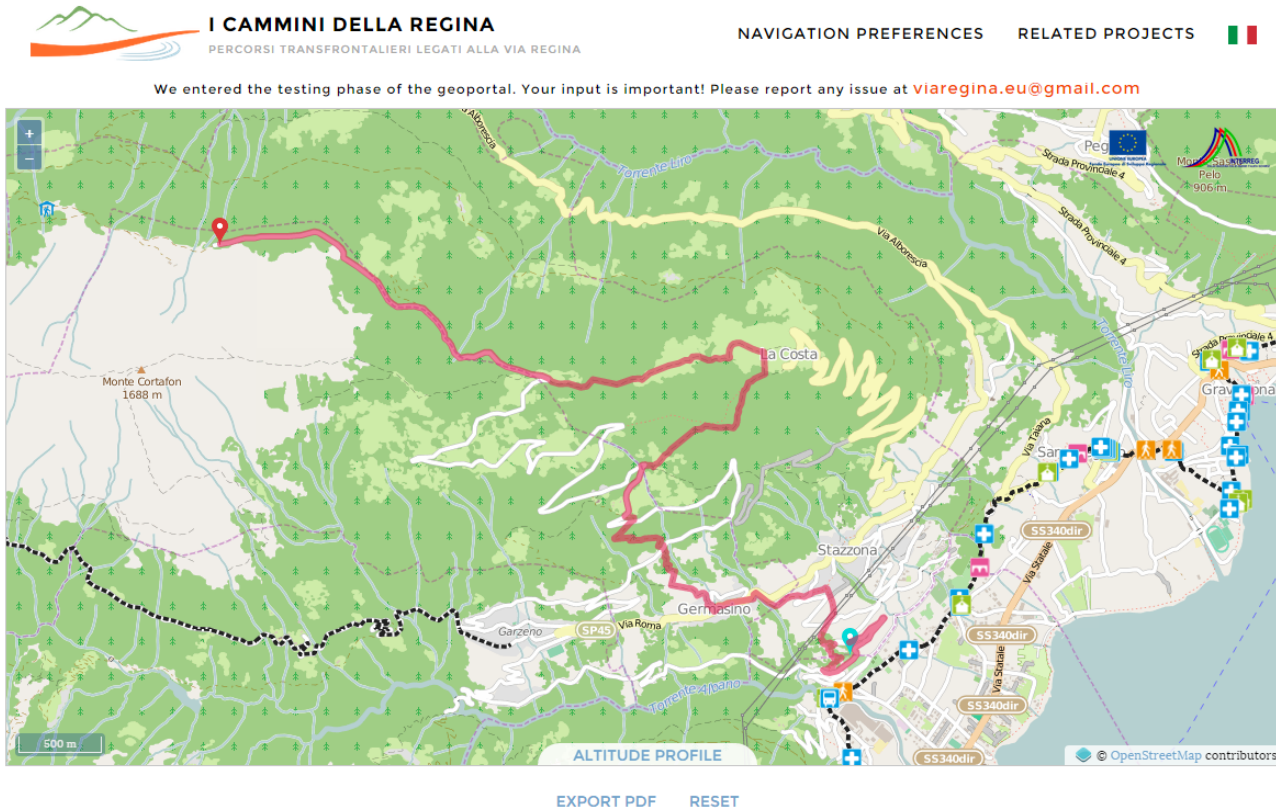
NAVIGATION PREFERENCES

RELATED PROJECTS 

- Link: <http://viaregina3.como.polimi.it/ViaRegina/>

2D Web viewer

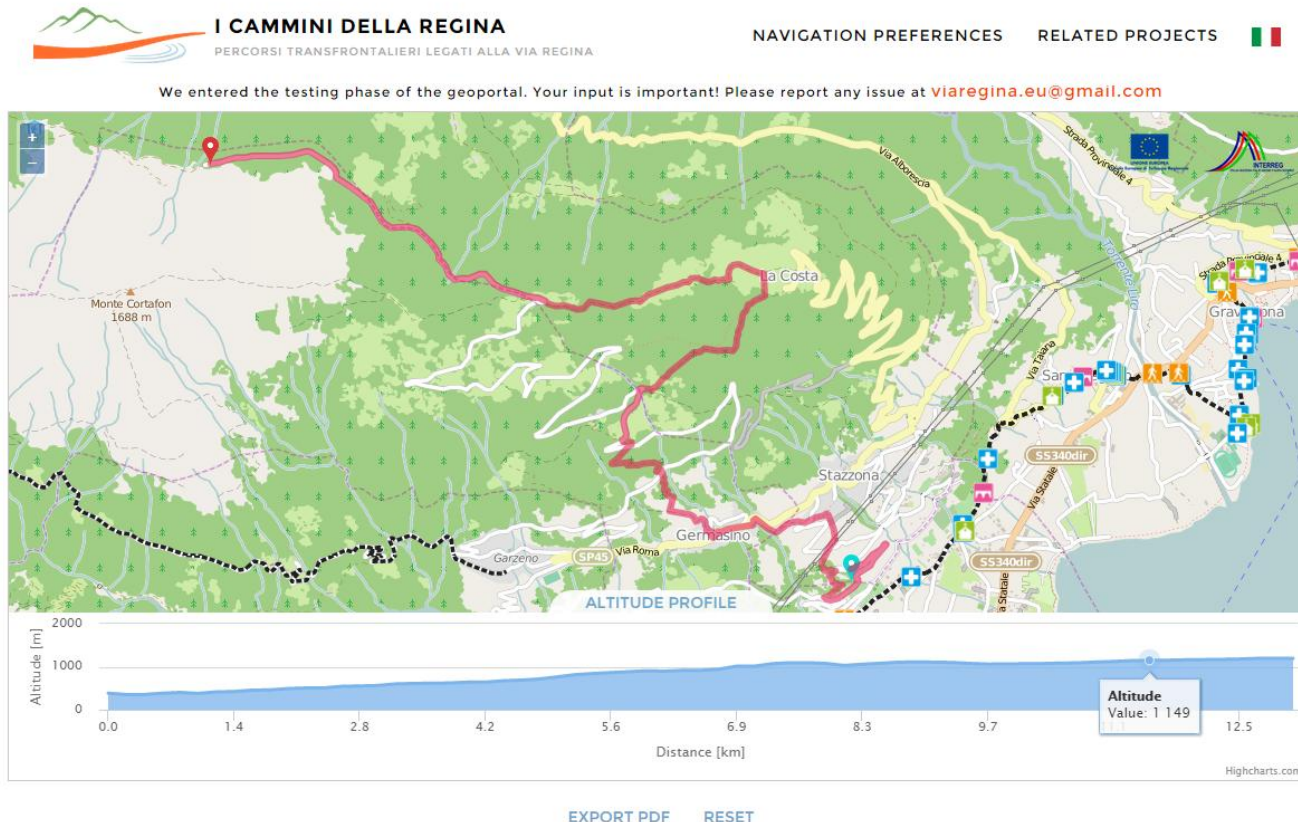
- Main 2D viewer of the project with advanced functionalities: **PostGIS**
- Calculation of the route based on user input about the types of POIs



- Link: <http://viaregina3.como.polimi.it/ViaRegina/>

- Main 2D viewer of the project with advanced functionalities:
 - Calculation of the terrain profile of this route

ZOO

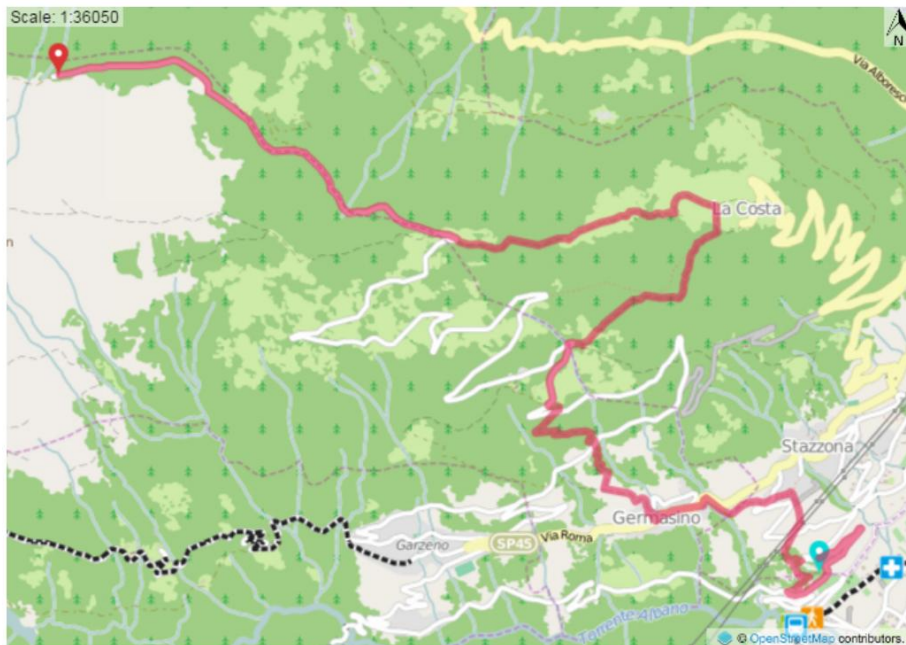


- Link: <http://viaregina3.como.polimi.it/ViaRegina/>



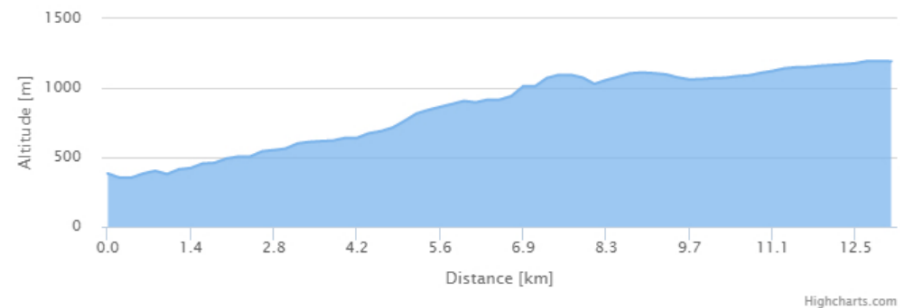
- Main 2D viewer of the project with advanced functionalities:
 - Exporting the route, the terrain profile and additional information

Your path



www.viaregina.eu

Altitude profile

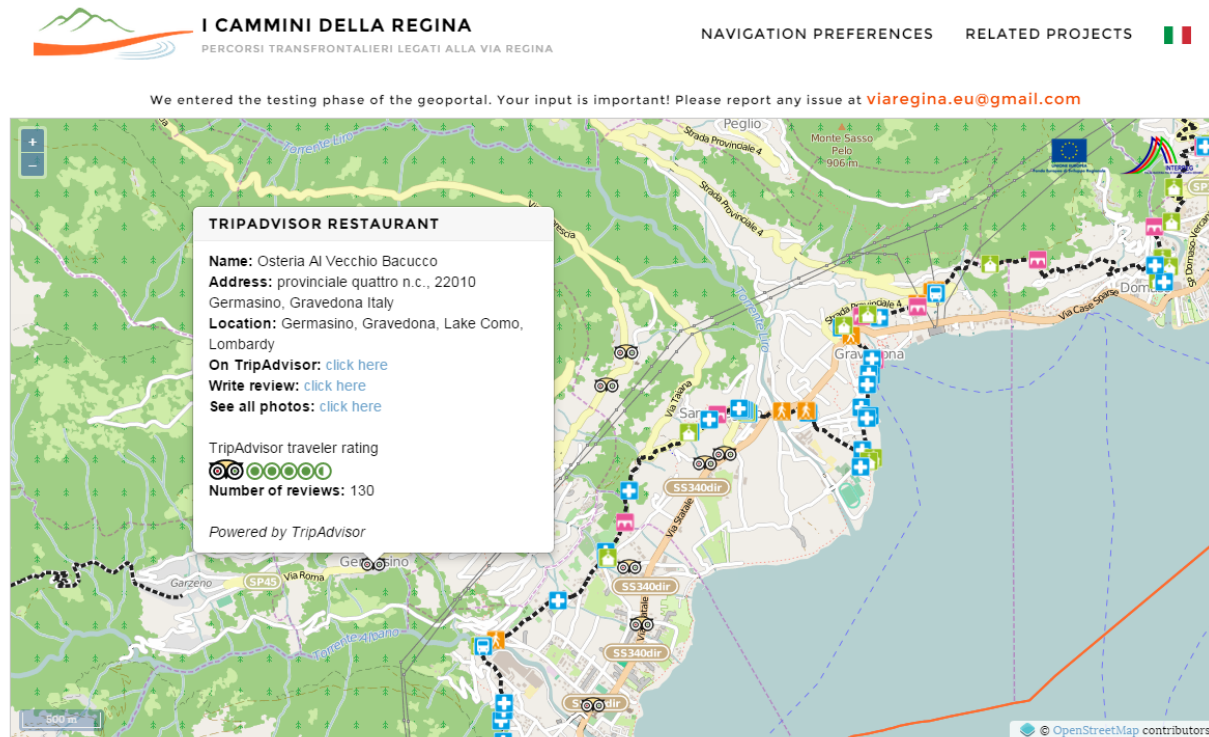


Total 2D distance: 13.3 km
Total 3D distance: 13.47 km
Average slope: 11.60%
Up height: 989 m
Down height: 180 m
Height difference: 809 m

- Link: <http://viaregina3.como.polimi.it/ViaRegina/>



- Main 2D viewer of the project with advanced functionalities:
 - Integration with TripAdvisor data
 - Getting information about hotels, restaurants and attractions around clicked point



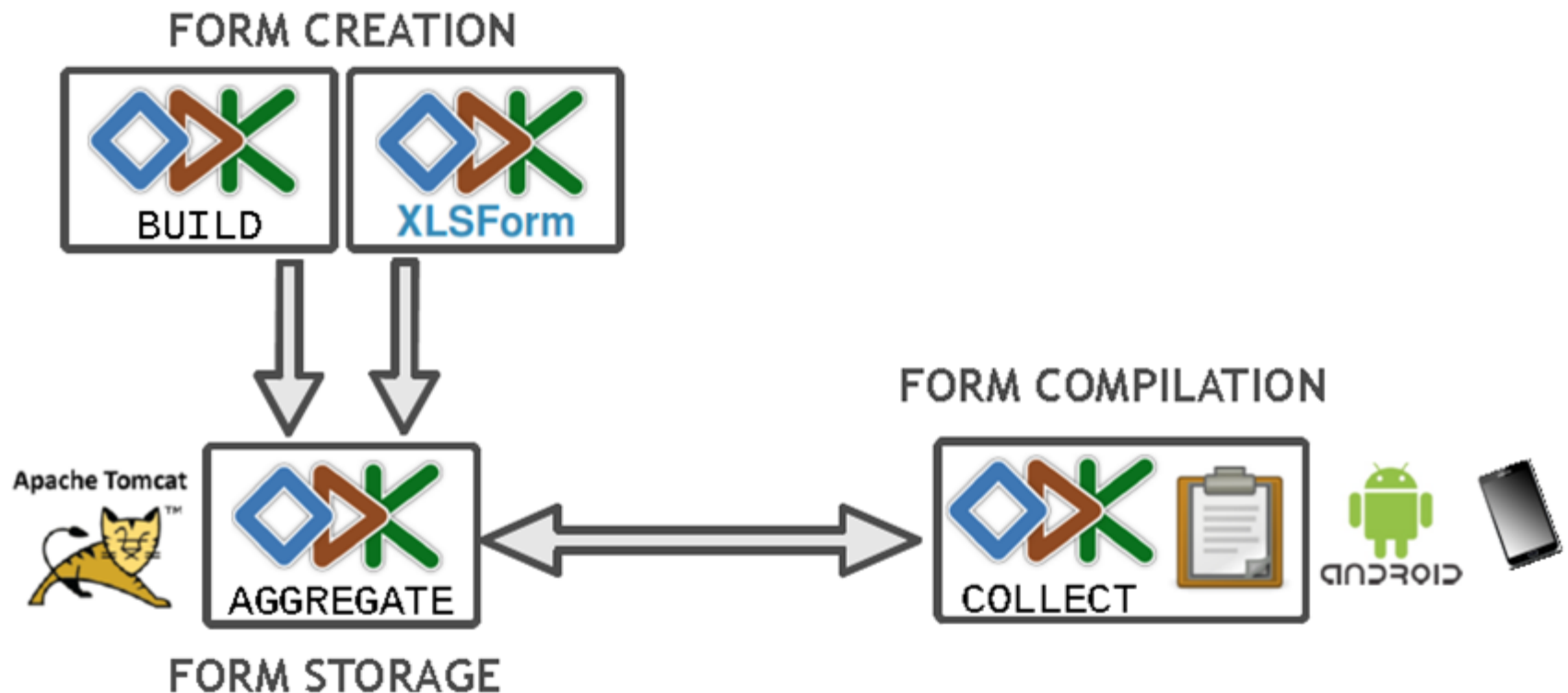
- Link: <http://viaregina3.como.polimi.it/ViaRegina/>

Mobile app for slow tourists

- Based on the suite of tools








- management of mobile data collection through a set of related applications



Mobile app for slow tourists



- Everyone can report Points of Interests (POIs) through an Android application.
- The categories of POIs are as follows:

HISTORICAL AND CULTURAL ELEMENTS

- Museum 
 - ethnographic
 - thematic
 - gallery
 - collections
- Religious Building 
 - church
 - oratory
 - sanctuary
 - chapel
 - via crucis
 - fresco
 - abbey
- Civil Building 
 - historical building
 - contemporary building
 - traditional building
 - monument
- Rural Building 
 - pasture/shed
 - snow deposit
 - graa/metato (chestnuts drier building)
 - roccolo (system designed to catch birds)
 - casello/turbino (buildings for the storage of perishable foods)
 - hydraulic structures
 - masseria (farm)
- Archeological Element 
 - archeological element
 - archeological site
 - element inside a building
 - single element

Mobile app for slow tourists

HISTORICAL AND CULTURAL ELEMENTS



- Military Building 
 - castle
 - Tower
 - defensive wall
 - fort
 - trench
 - redoubt (secondary fort)
 - bunker
- Factory 
 - furnace
 - trip hammer
 - mill
 - sawmill
 - quarry
 - mine
 - rural factory

MORPHOLOGICAL ELEMENTS

- Surface 
 - pavement
 - natural material
 - gravel
 - asphalt
 - steps
 - ford




Mobile app for slow tourists

MORPHOLOGICAL ELEMENTS

- Bounding Escarpment 
 - rock
 - ground escarpments
 - rock escarpments
 - support walls
 - boundary walls and railings
 - tree-lined avenues
 - fence/barrier
 - vertical plate
- Traffic Support and Manufactured Products 
 - kilometric stone
 - border stone
 - stone marker
 - isolated tree
 - inscription
 - fountain
 - ancient laundry
 - bridge
 - rest of bridge
 - tomb
 - underpass
 - tunnel
 - panoramic viewpoint

Mobile app for slow tourists

TOURIST ELEMENTS

- Accommodation 
 - hotel
 - hostel
 - B&B
 - hut/shelter
 - camping
 - private accomodation
 - free accommodation
 - agritourism
 - apartment
- Transport 
 - bus stop
 - dock/ferry
 - Train station
 - funicular and ski lift
- Products 
 - Wine shop
 - craft
 - food/typical products
 - clothing shop

• Services

- pharmacy
 - parking
 - school
 - public safety
 - spring
 - city hall
 - post office
 - wc
 - bank
 - park area
 - ATM
 - info point
 - wifi hotspot
 - bike sharing
 - electric car charging point
 - hospitals/emergency room
 - hiking signs
- ## • Food Service
- restaurant
 - crotto (cellar inside a natural curve)
 - bar
 - food shop

Mobile app for slow tourists

CRITICAL ELEMENTS

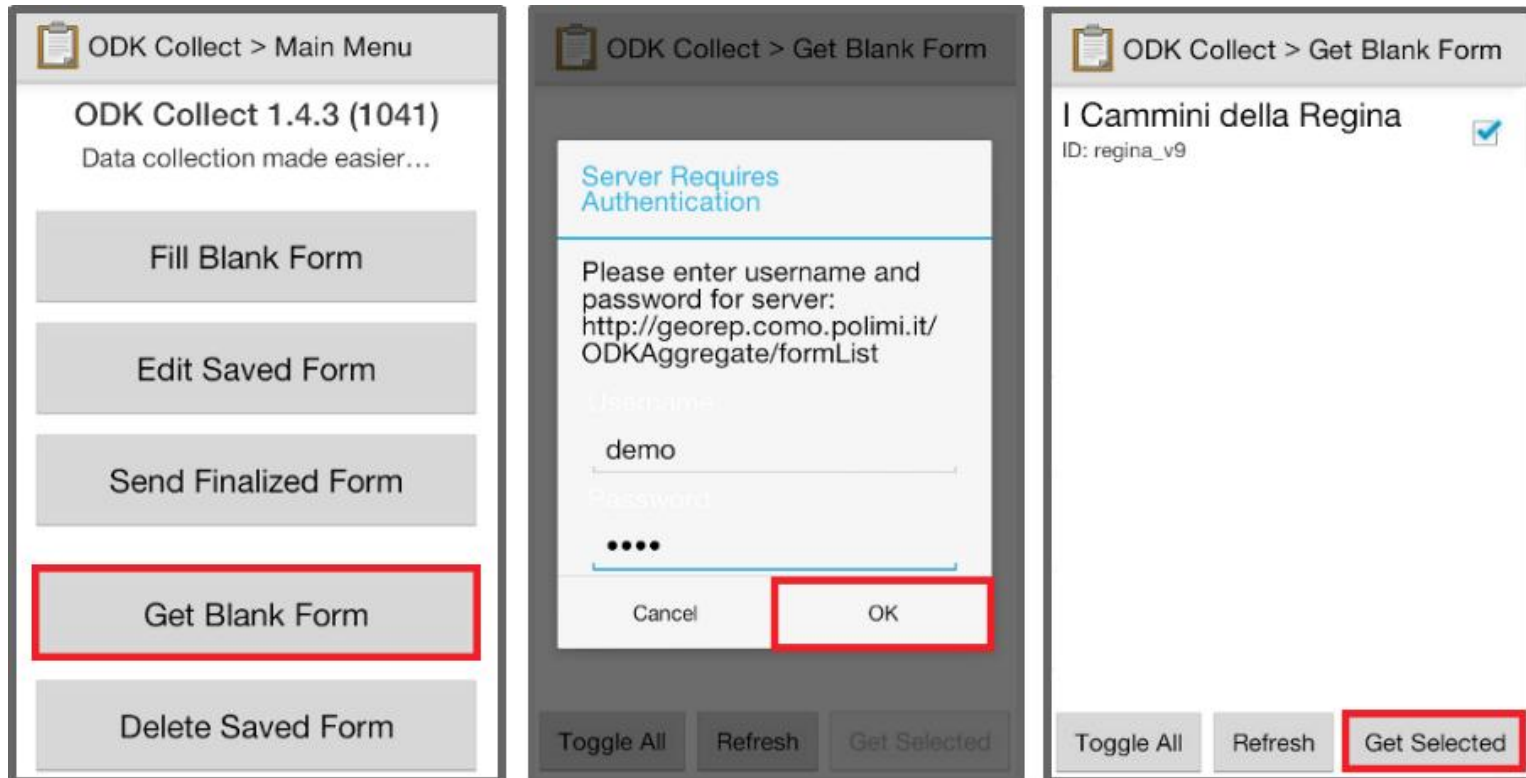
- Morphological 
 - ford
 - landslide
- Structural 
 - crossing with traffic light
 - crossing without crossing stripes
 - crossing with crossing stripes

WARNING

- [whatever kind of warning user specifies]

Mobile app for slow tourists

- Form download & compilation

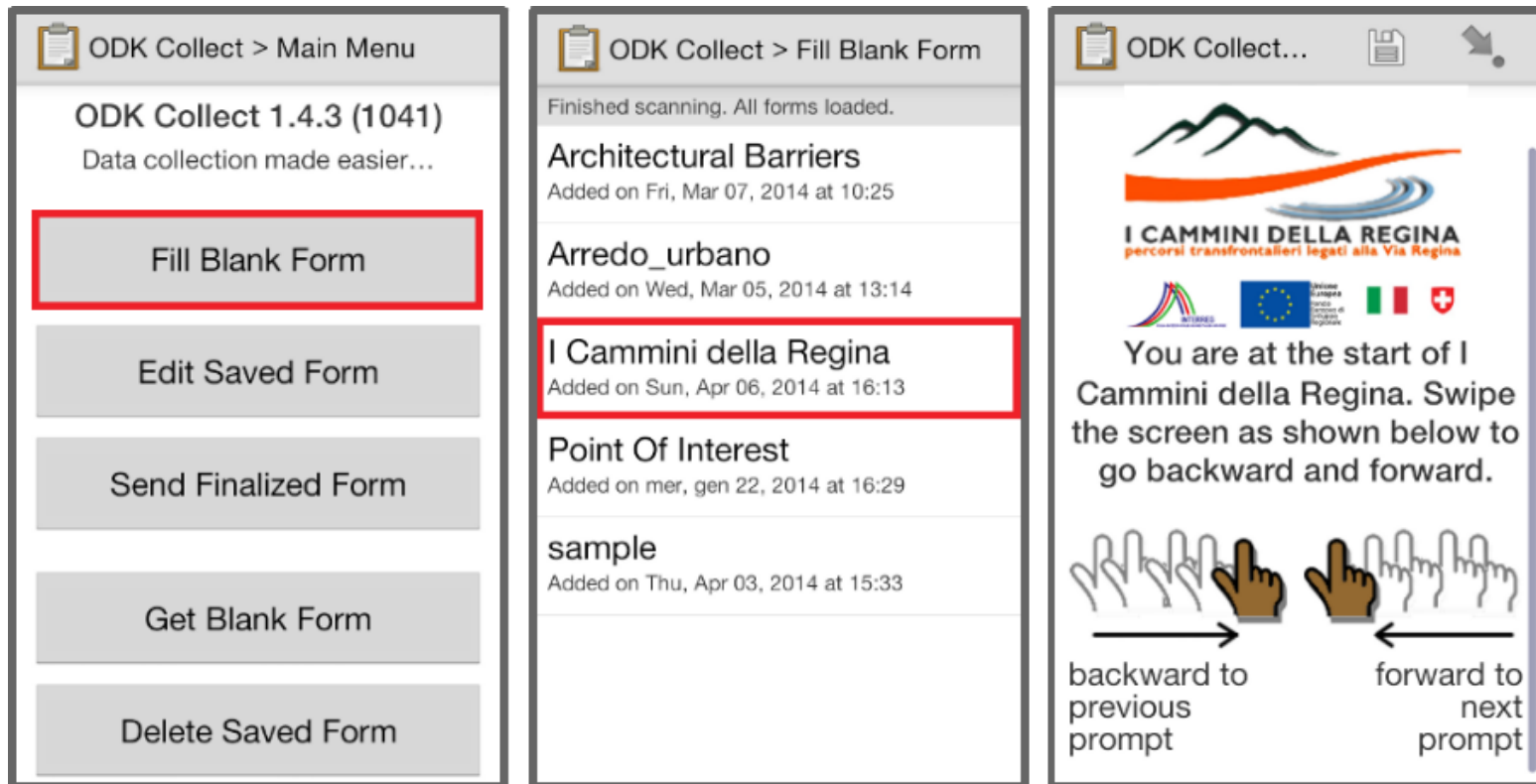


- Detailed instructions:

http://www.viaregina.eu/files/documenti/2014/istruzioni_eng.pdf

Mobile app for slow tourists

- Form download & compilation




- Detailed instructions:

http://www.viaregina.eu/files/documenti/2014/istruzioni_eng.pdf

Mobile app for slow tourists

- Form download & 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

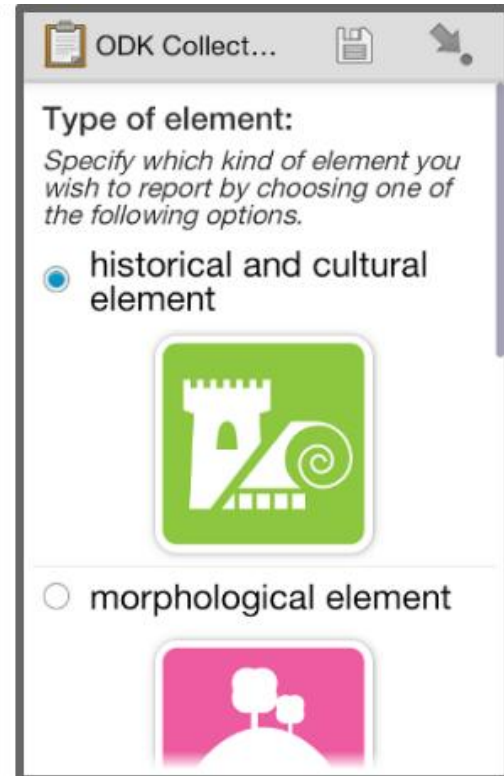


ODK Collect...

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

- Detailed instructions:
http://www.viaregina.eu/files/documenti/2014/istruzioni_eng.pdf

Mobile app for slow tourists

- Form download & compilation

The image displays three sequential screenshots of the ODK Collect mobile application interface, showing the steps to compile a form.

Screenshot 1: Classification of the element:
The screen shows the title "Classification of the element:" followed by the instruction "Classify the element you wish to report by choosing one of the following options." There are two radio button options: "museum" (selected) and "religious building". Below each option is a green square icon: a museum building for "museum" and a church for "religious building".

Screenshot 2: Subclassification of the element:
The screen shows the title "Subclassification of the element:" followed by the instruction "Classify the element you wish to report by choosing one of the following options (optional)." There are four radio button options: "ethnographyc", "thematic" (selected), "gallery", and "collections".

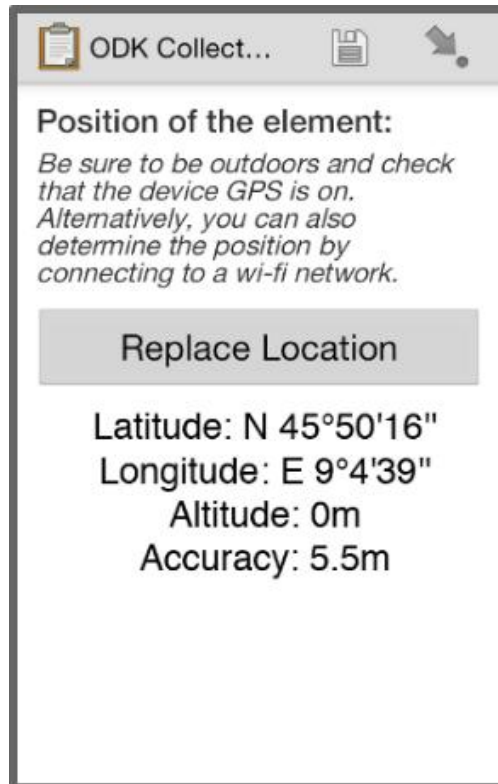
Screenshot 3: Name of the element:
The screen shows the title "Name of the element:" followed by the instruction "Type the name of the element you wish to report (optional)." The text "Museum of Villa Erba" is entered into the text field below the instruction.

- Detailed instructions:

http://www.viaregina.eu/files/documenti/2014/istruzioni_eng.pdf

Mobile app for slow tourists

- Form download & compilation

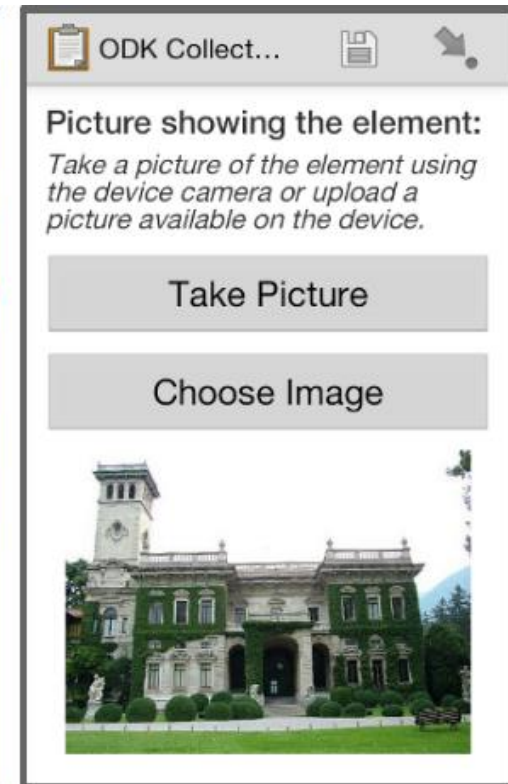
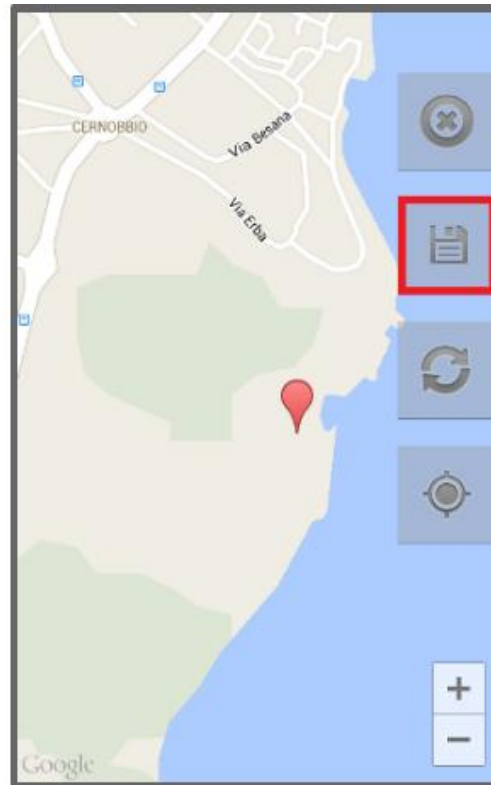


ODK Collect...

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




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



- Detailed instructions:
http://www.viaregina.eu/files/documenti/2014/istruzioni_eng.pdf

Mobile app for slow tourists

- Form download & compilation

The image displays three sequential screenshots of the ODK Collect mobile application interface, which is used for data collection. Each screenshot has a header bar with the text 'ODK Collect...' and icons for a clipboard, a document, and a back arrow.

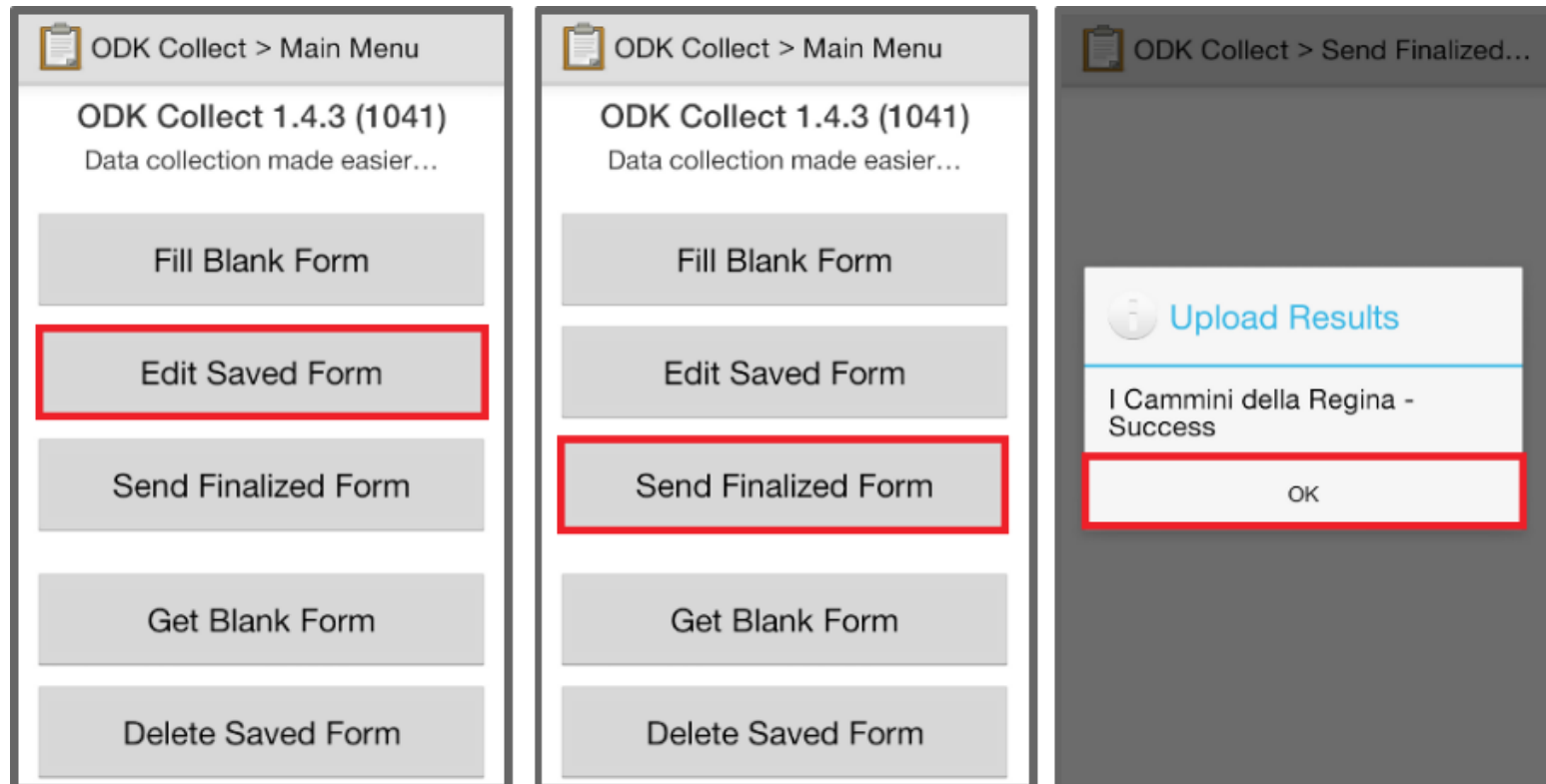
- First Screenshot (Audio Recording):** The main heading is 'Record audio:' followed by the instruction 'Record or upload an audio using your device (optional)'. Below this are three buttons: 'Record Sound', 'Choose Sound', and 'Play Sound'.
- Second Screenshot (Video Capture):** The main heading is 'Capture video:' followed by the instruction 'Capture or upload a video using your device (optional)'. Below this are three buttons: 'Record Video', 'Choose Video', and 'Play Video'.
- Third Screenshot (Form Completion):** The text reads 'You are at the end of I Cammini della Regina.' followed by 'Name this form'. Below this is a text input field containing 'I Cammini della Regina'. There is a checked checkbox labeled 'Mark form as finalized'. At the bottom, a button labeled 'Save Form and Exit' is highlighted with a red rectangular border.

- Detailed instructions:

http://www.viaregina.eu/files/documenti/2014/istruzioni_eng.pdf

Mobile app for slow tourists

- Form download & compilation

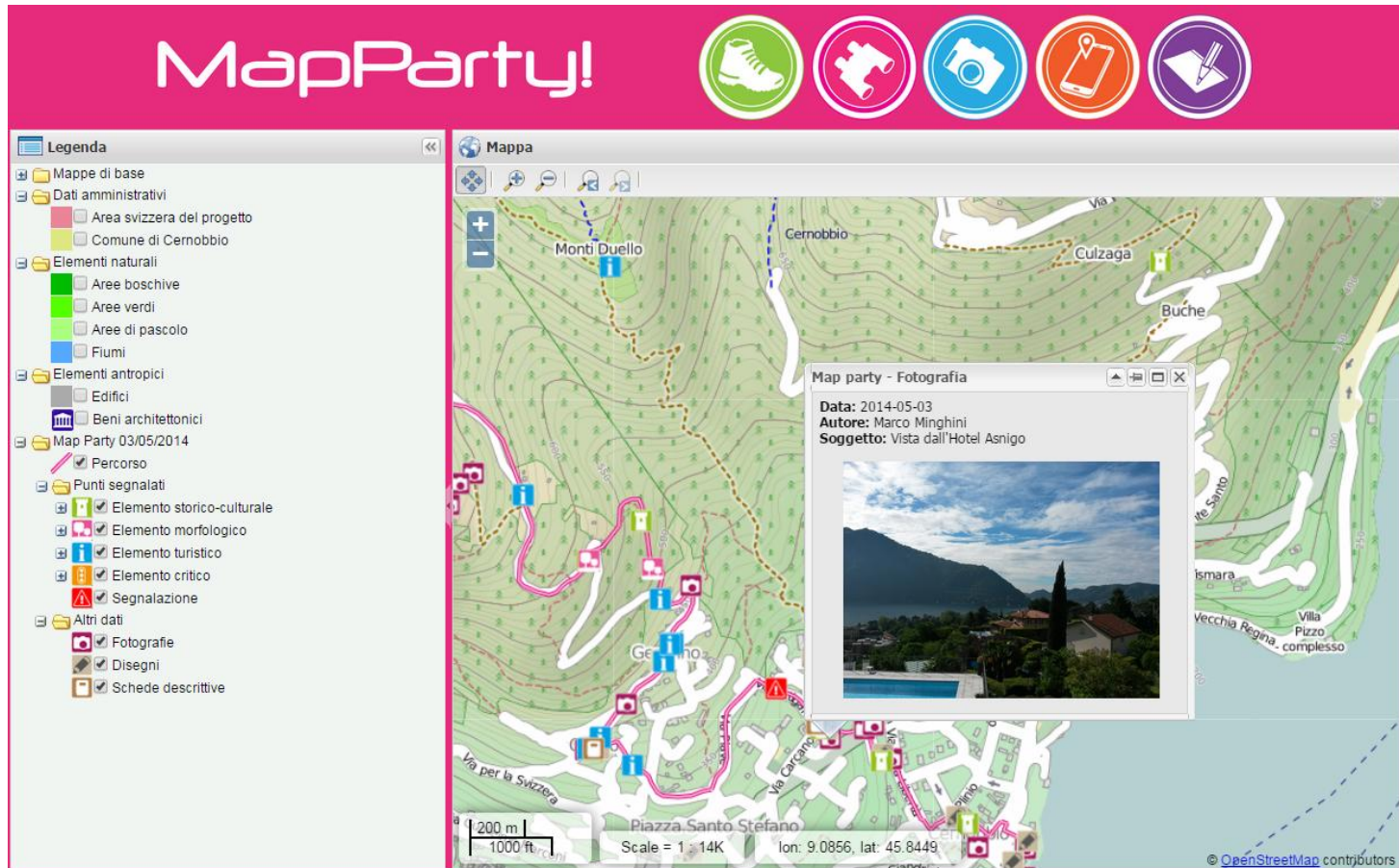


- Detailed instructions:

http://www.viaregina.eu/files/documenti/2014/istruzioni_eng.pdf

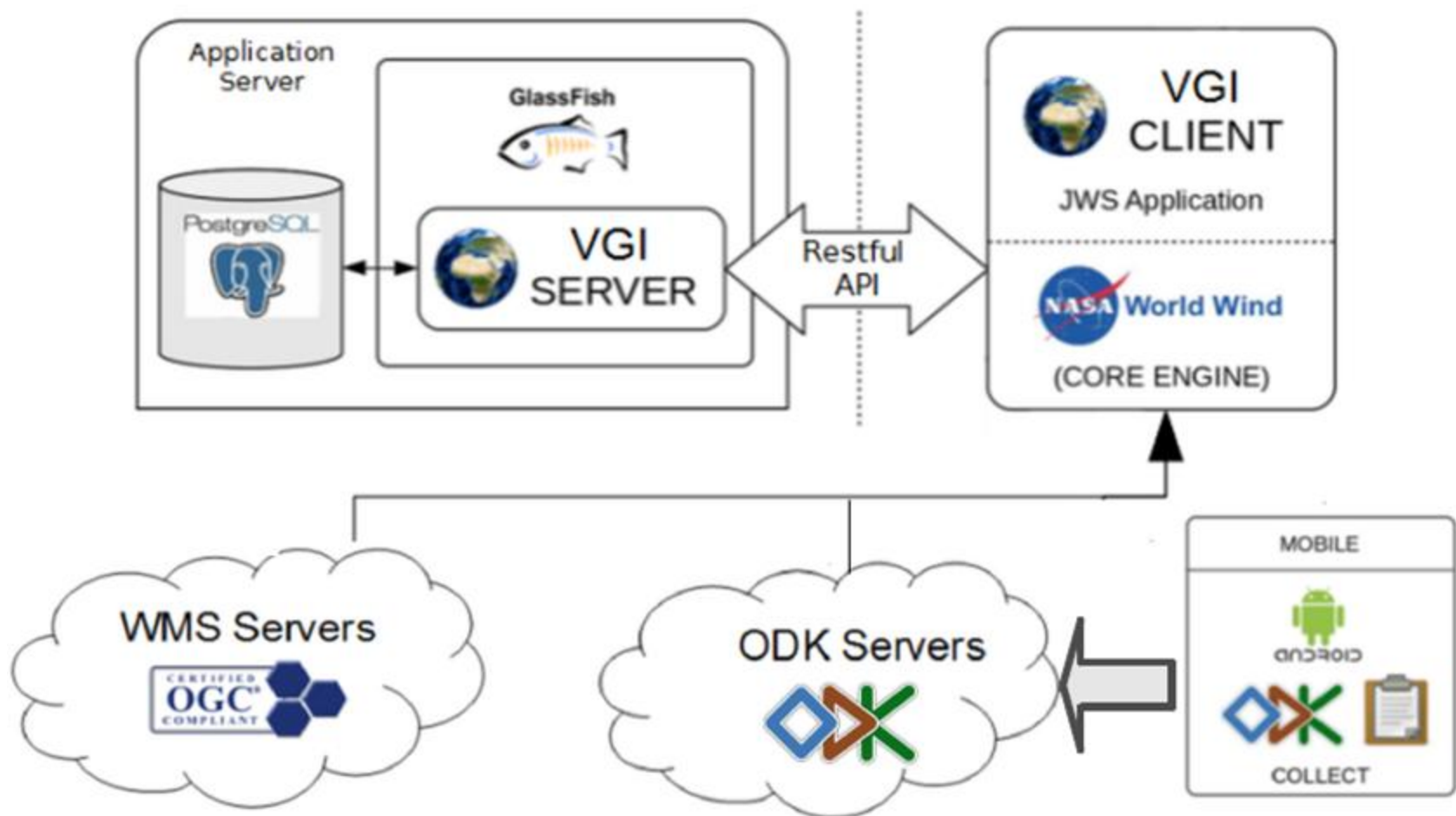
Mobile app for slow tourists – Mapping Party

- Collected data can be seen in MapParty WebGIS



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

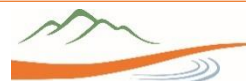
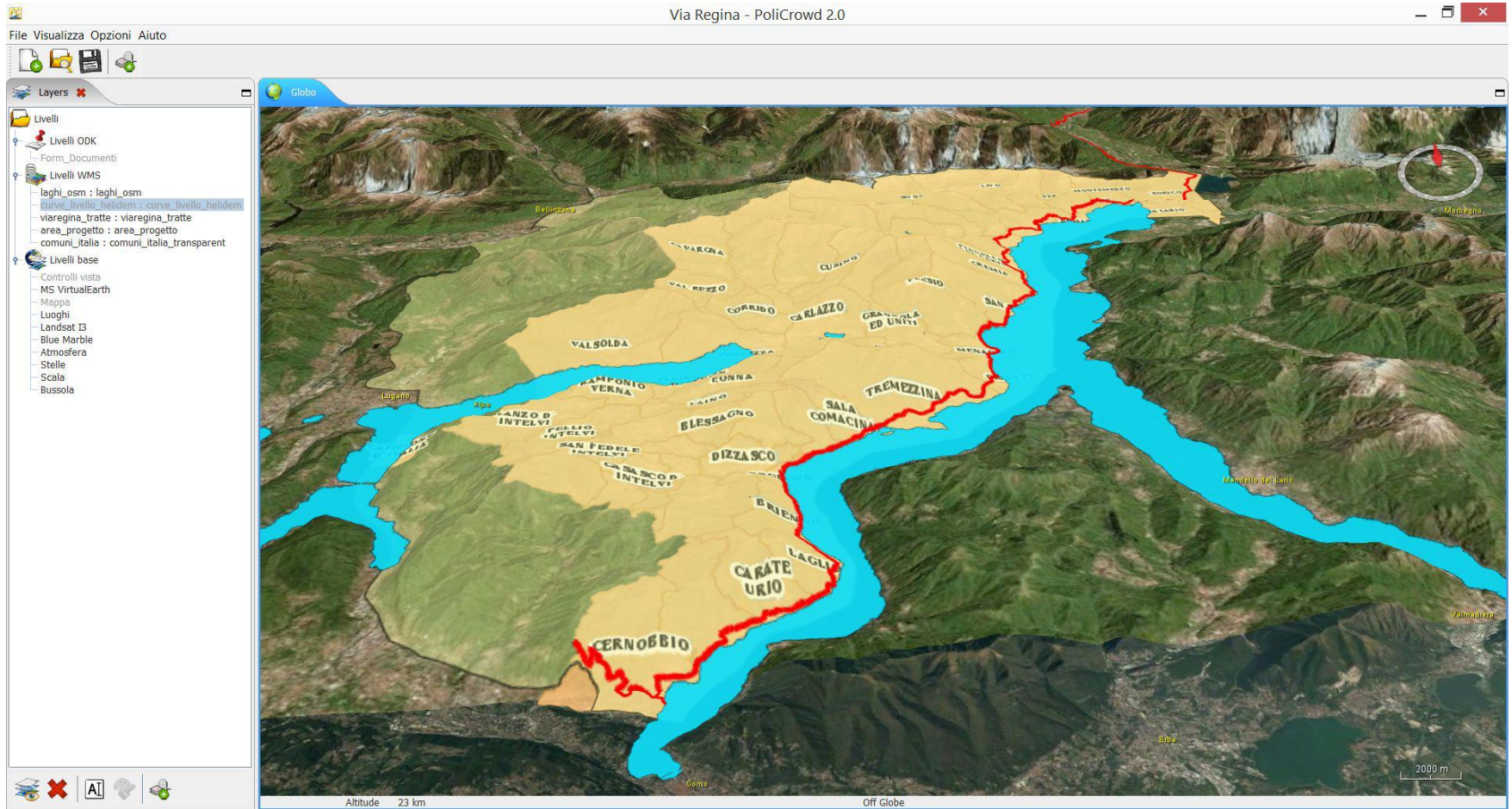
3D Web viewer



<http://www.viaregina2.como.polimi.it/ViaRegina2.0/ViaRegina20.jnlp>

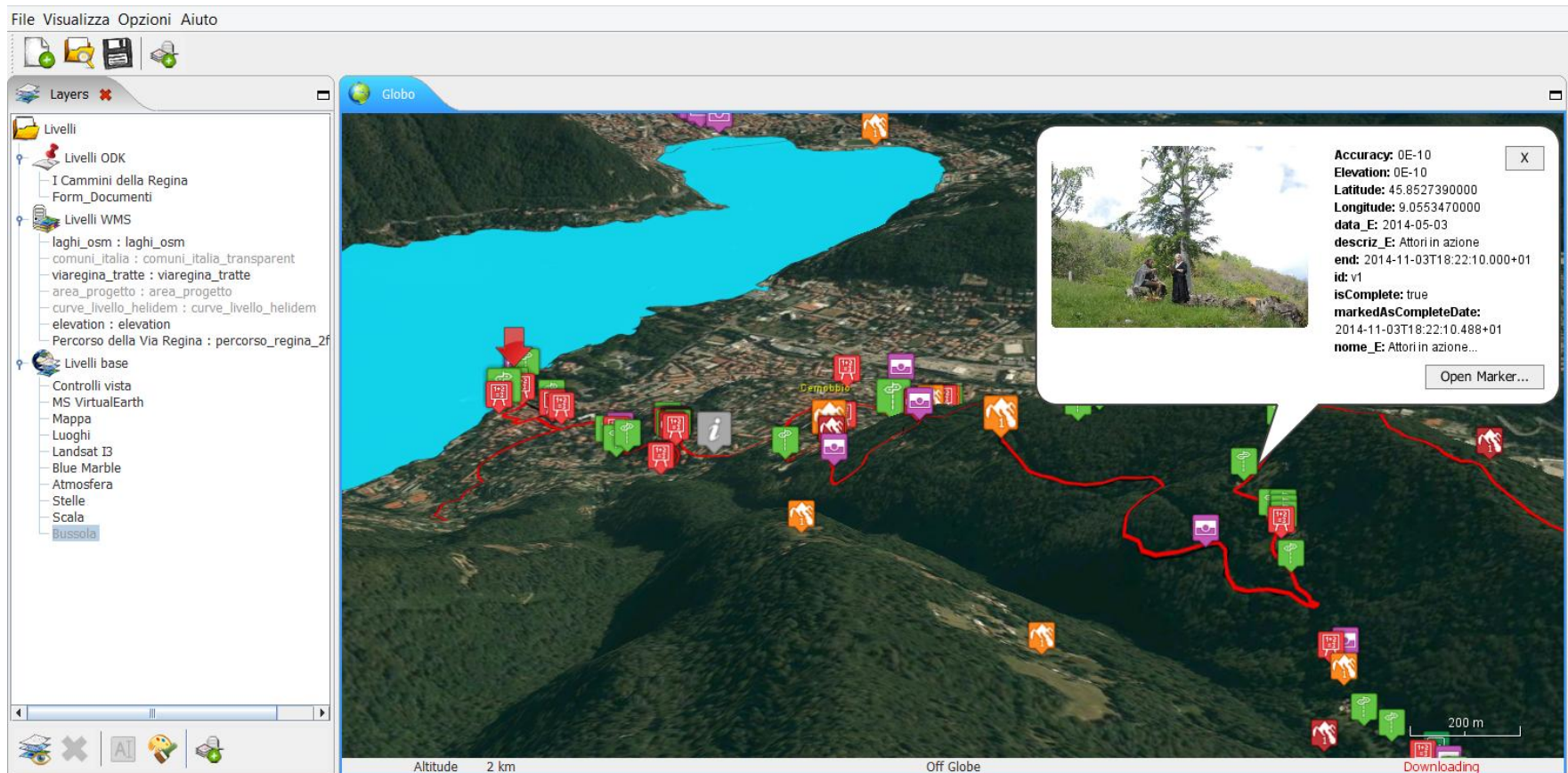
3D Web viewer

- Connection to WMSs (including the project servers)



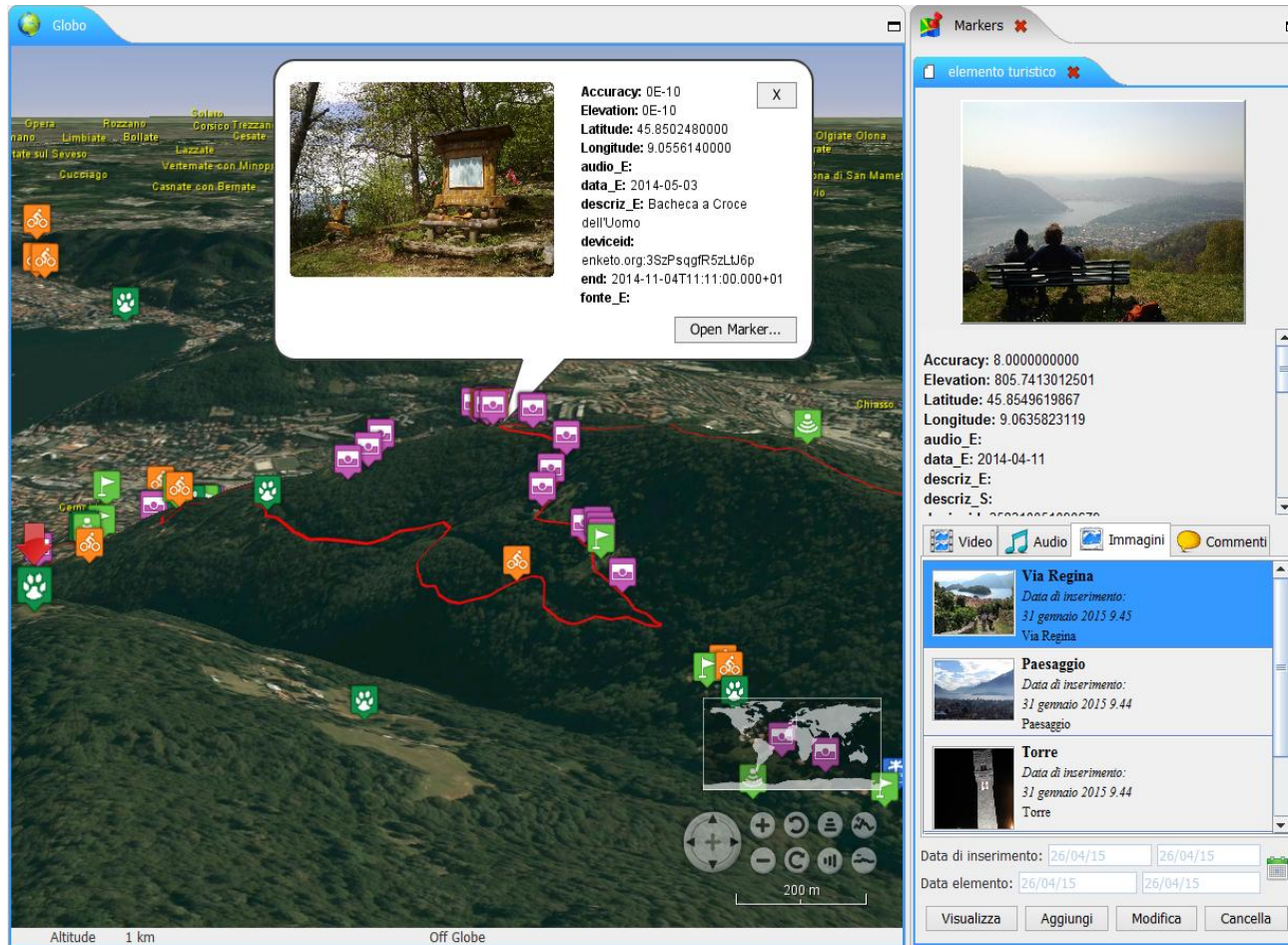
3D Web viewer

- Connection to ODK servers (including the project servers)



3D Web viewer

- Query of the ODK data and possibility of enriching the database with additional content (photos, videos, documents & notes)



Cultural tourism

Tangible and intangible heritage



(Cultural Tourism Industry Group, <http://www.culturaltourismvictoria.com.au/>)

“Cultural tourism is an entertainment and educational experience that combines the arts with natural and social heritage and history.”



- promote the diffusion of the knowledge

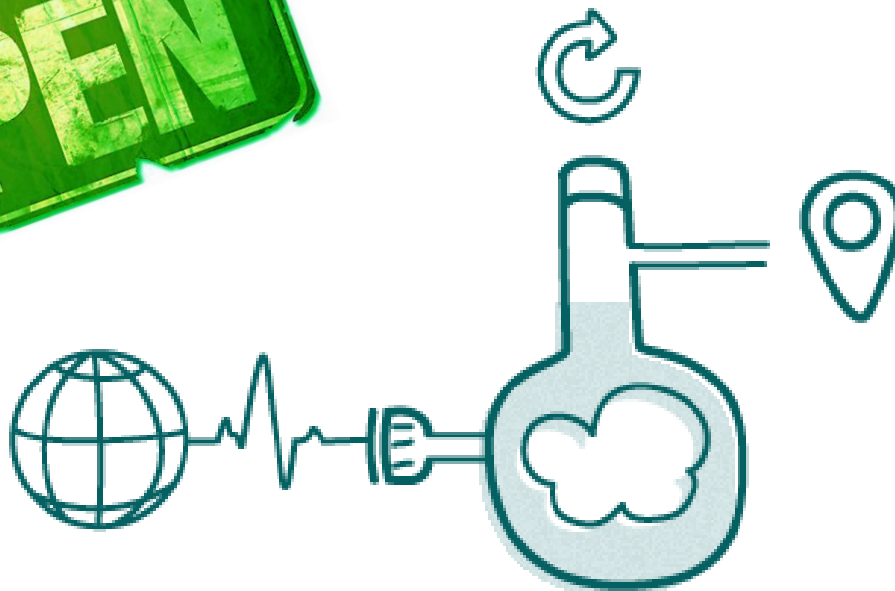
- protect the territory

- foster the tourism

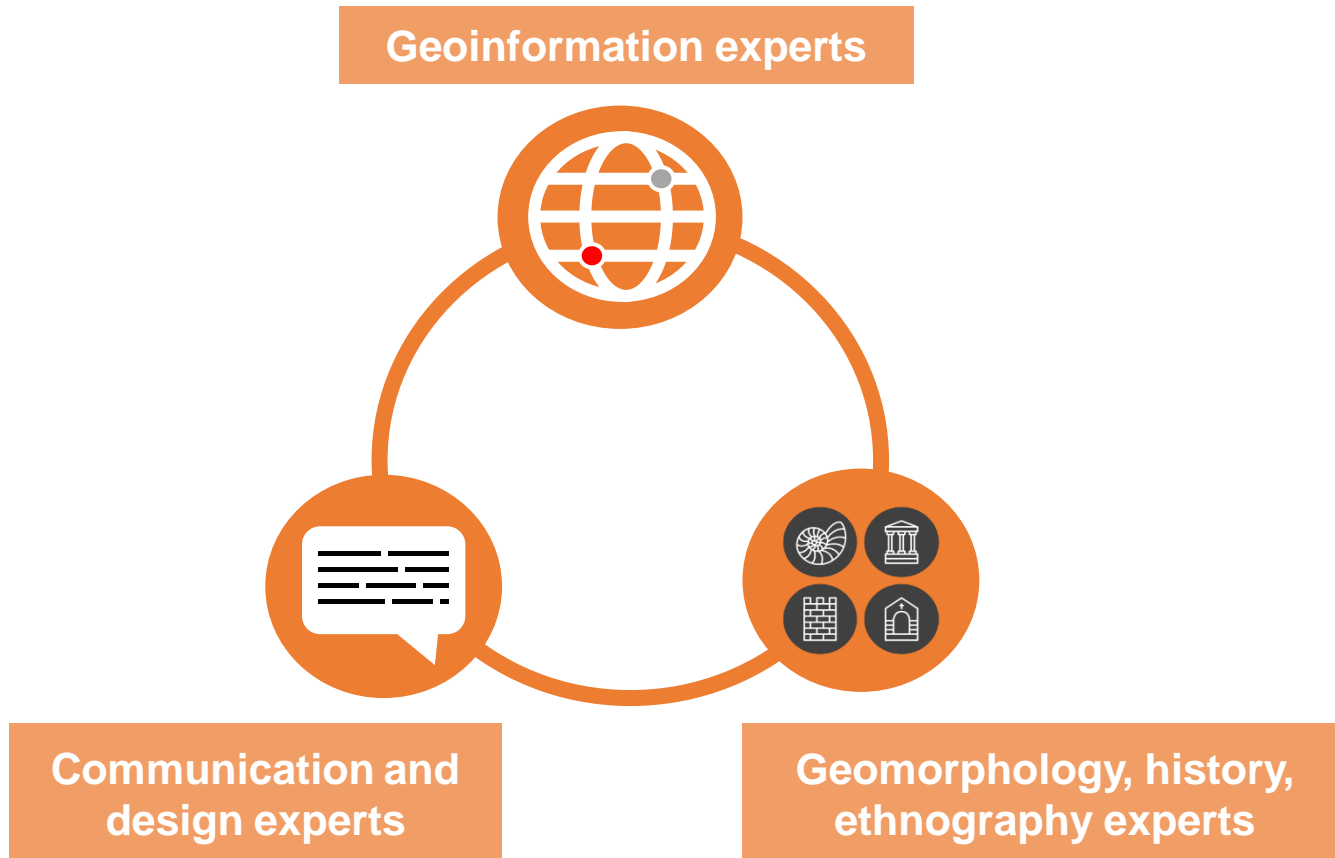
Environmental and cultural understanding of the territory passed through is the triggers to reach the objectives.

Methodology

- Extensive usage of Free and Open Source with Geospatial technologies as a mainstream



Integrated multidisciplinary development

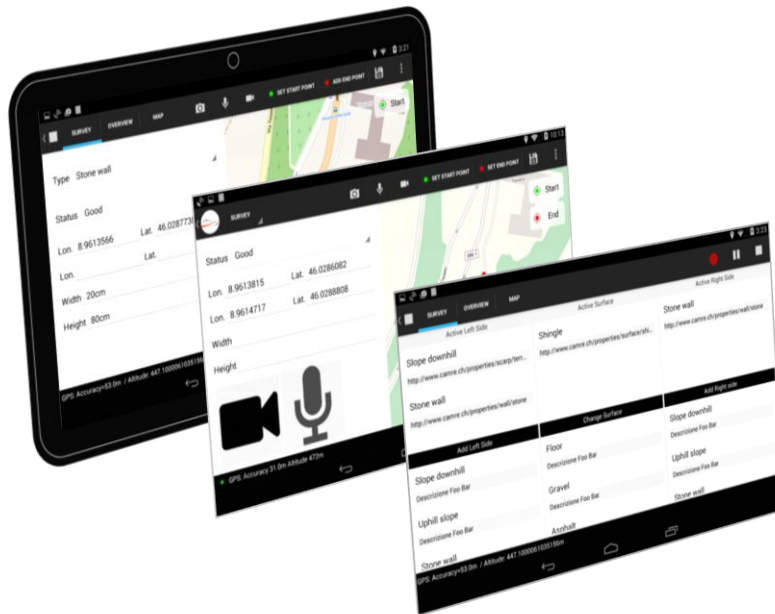


- Concept, design and development of two distinct applications for two different scopes

[illegible]

Transguardi Web

- Practical solution to support the survey and management of data for the cultural routes: mobile application.



FOSS Technologies

- Android
- Couchdb lite
- JTS Java Topology Suite
- JSON
- GeoJSON
- OpenLayers3
- Proj4js

Inventory of Historical Traffic Routes in Switzerland (IVS)

ivs

Inventar historischer Verkehrswege der Schweiz
Inventaire des voies de communication historiques de la Suisse
Inventario delle vie di comunicazione storiche della Svizzera
Inventari da las vias da comunicaziun istoricas da la Svizra



- Land planning and heritage protection

- Allocate funds for maintenance

Surface

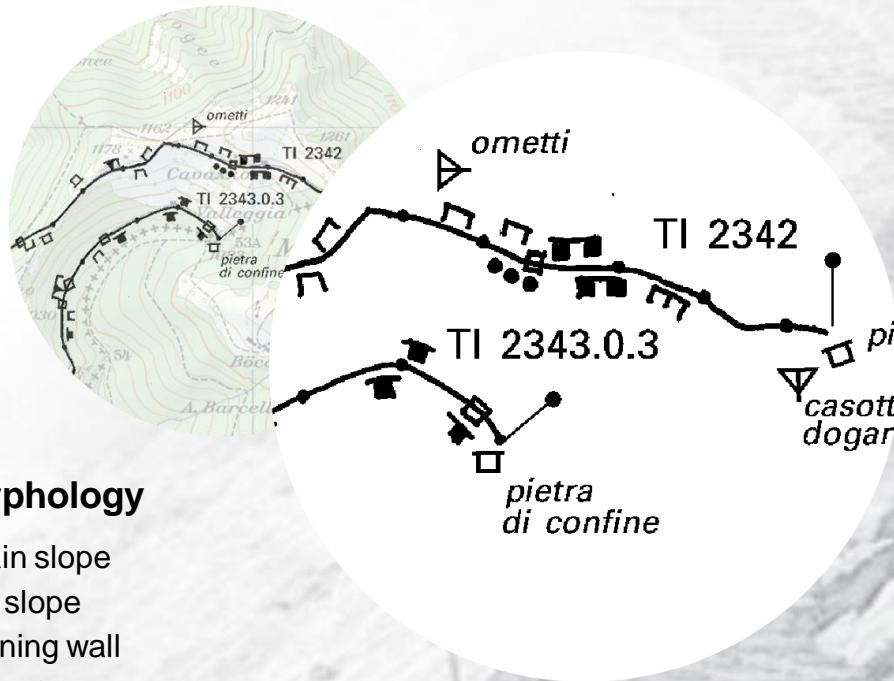
- ◆◆◆◆◆ rocks
- natural
- gravel
- pavement
- asphalt
- steps

Morphology

- ▬▬▬▬▬ terrain slope
- ▬▬▬▬▬ rock slope
- ▬▬▬▬▬ retaining wall
- ▬▬▬▬▬ parapet
- hedge, trees
- ▲ kerbstone
- ▬▬▬▬▬ vertical planks
- x-x-x-x fence

Artefact

- ▬▬▬ bridge
- ▬▬▬ ruin of bridge
- tubin
- ▬▬▬ tunnel



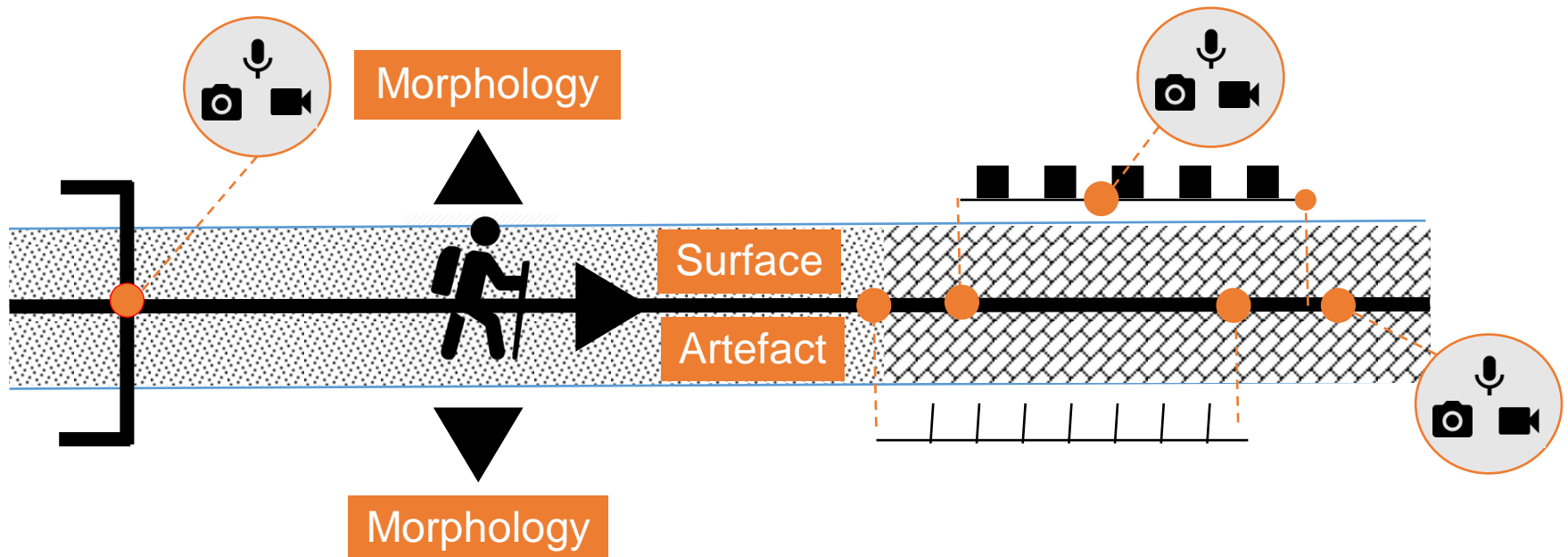
Nuovo approccio al rilievo



vs



- location, notes and metadata of Elements found along the way:
 - Left side; - Right side; - In front



{JSON}

- Resulting in digital data following a data model

New data model

- Register your track and along it:
 - Register elements start & end points
 - Register characteristics (type, width, height, etc.)
 - Add multimedia notes (audio, video, text)

- Send to the server to store

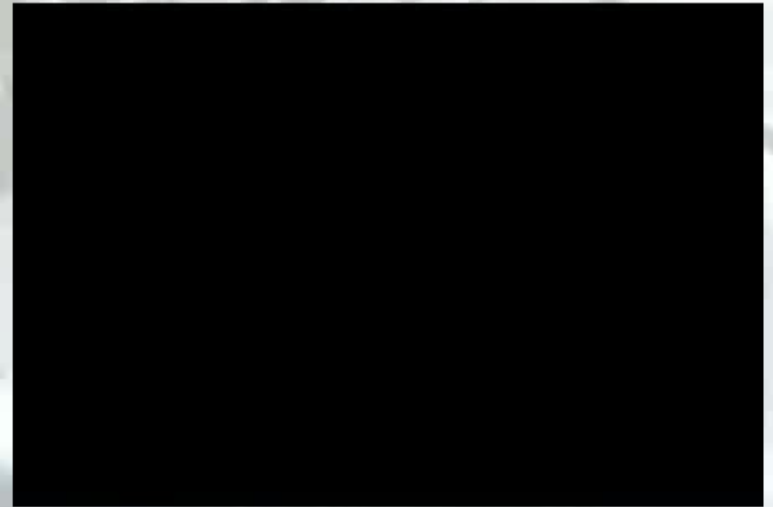
- Elaborate data using “linear referencing” for display

Key	Value
▼ (1) ObjectId("53d61fdb3fb6ed2ac08c5011")	{ 14 fields }
_id	ObjectId("53d61fdb3fb6ed2ac08c5011")
▶ characteristics	{ 7 fields }
name	vf:1
▼ rightside	Array [1]
▼ 0	{ 8 fields }
height	7.350000
▶ startPoint	{ 5 fields }
width	2.350000
type	www.camre.ch/properties/scarp/terrain/down
_id	ObjectId("53d61fdb3fb6ed2ac08c4ff9")
▶ notes	Array [1]
▶ endPoint	{ 5 fields }
status	www.camre.ch/properties/surface/status/good
▼ leftside	Array [2]
▶ 0	{ 8 fields }
▶ 1	{ 8 fields }
▼ surface	Array [1]
▶ 0	{ 7 fields }
status	www.camre.ch/status/pending
▶ author	{ 3 fields }
▶ geometry	{ 3 fields }
▶ contributors	Array [0]
path	via del ferro
▶ bridge	Array [1]
timestamp	2014-07-28 10:03:07.580Z
▶ techinfo	{ 6 fields }
▶ (2) ObjectId("53d61ffd3fb6ed2ac08c5039")	{ 14 fields }

Path initialization



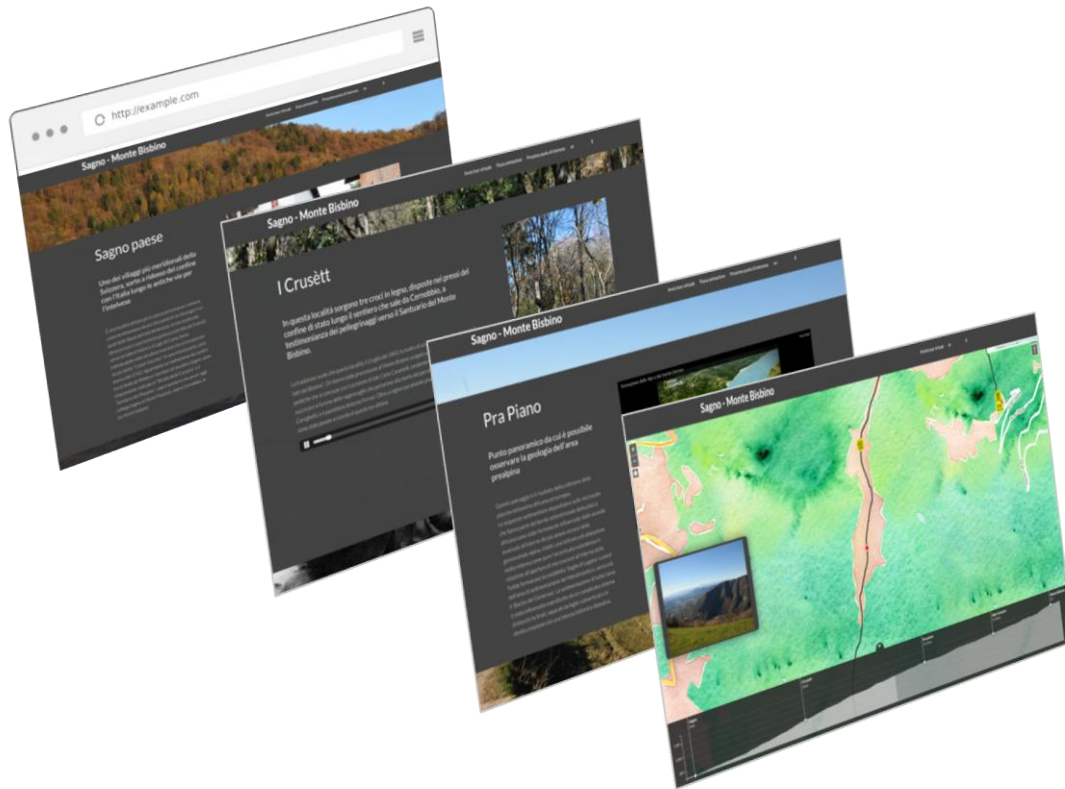
Survey



Overview of survey



- Emotional and immersive solution that, associating places (geo-information) with the technique of storytelling (narrative) and multimedia (images, video, audio and photosphere), promote the understanding of the territory through the dissemination of its history, culture and landscape.



FOSS Technologies

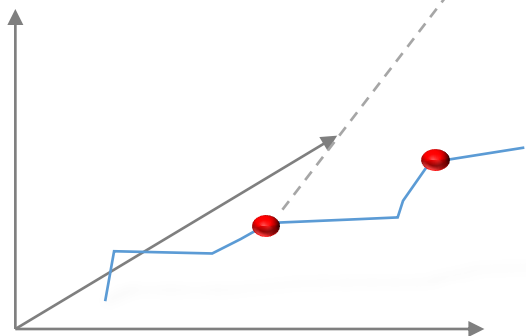
- OpenLayers
- Bootstrap
- JQuery
- D3.js
- Less.js
- GeoJSON
- OpenLayers3
- Pano

Geographically referenced multimedia builder

JSON with POIs

```
{
  "type": "Feature",
  "geometry": {
    "type": "Point",
    "coordinates": [
      9.038951437350024,
      45.85650068640169
    ],
    "crs": {
      "type": "name",
      "properties": {
        "name": "EPSG:4326"
      }
    }
  },
  "properties": {
    "id": 1,
    "name": "Sagno",
    "type": "Storico",
    "legend": true,
    "profile": true,
    "time": "0min"
  }
}
```

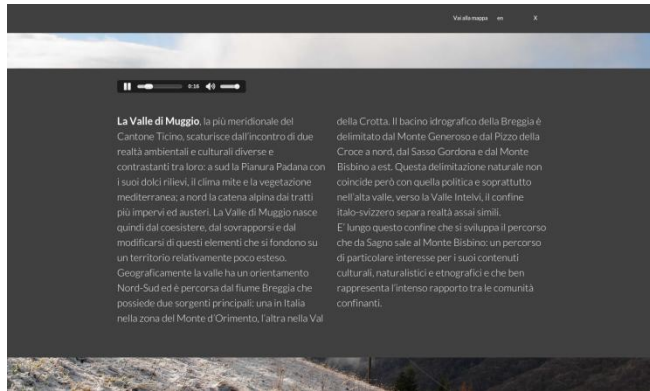
3D path



POI specific representation

```
{
  "main": [
    {
      "type": "cd-fixed-bg",
      "backgroundImage": "resources/sagno/images/cavazzo/image1.jpg"
    },
    {
      "type": "cd-scrolling-bg",
      "styleClass": "cd-color-2",
      "content": {
        "text": {
          "position": "left",
          "title": "Alpe Cavazzo",
          "description": "In una interessante carta storica del 1762, ri",
          "text": "Il sentiero che sale alla località Cavazzo e quindi a",
          "column": "number of column"
        }
      },
      "multimedia": {
        "type": "image",
        "link": "resources/sagno/images/cavazzo/image2.jpg",
        "orientation": "v"
      },
      "audio": [
        {
          "url": "resources/sagno/audio/en/part2.ogg",
          "type": "audio/ogg"
        },
        {
          "url": "resources/sagno/audio/en/part2.mp3",
          "type": "audio/mpeg"
        }
      ]
    }
  ],
  "type": "cd-fixed-bg",
  "backgroundImage": ""
}
```


Virtual Tour



Audio



Dynamic map

Demo

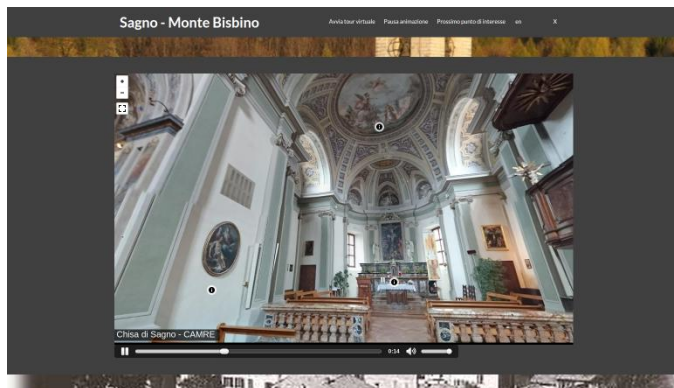
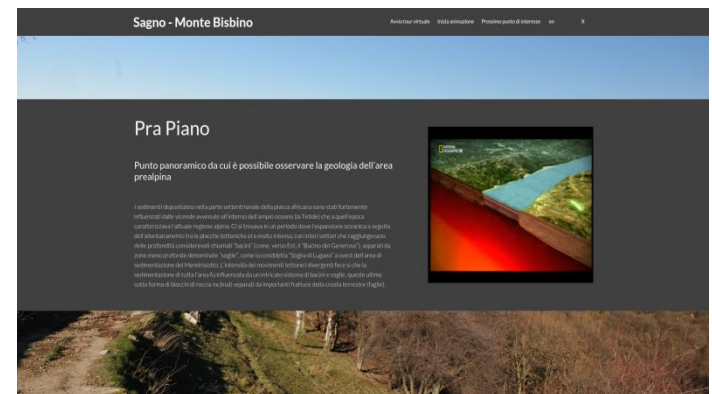


Photo sphere



Video

Sagno – Monte Bisbino

Dalla religiosità all'illegalità



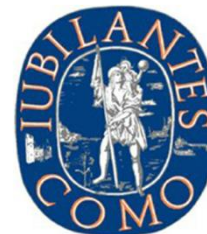
Thank you

Scuola universitaria professionale
della Svizzera italiana

SUPSI



POLITECNICO DI MILANO



Fondazione
Politecnico
di Milano



Città
di Cernobbio



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



Unione Europea

Fondo Europeo di Sviluppo Regionale



INTERREG

ITALIA-SVIZZERA ITALIE-SUISSE ITALIEN-SCHWEIZ

Le opportunità non hanno confini.

