DELIVERABLE

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D 4.7 Map enhancement to project website using the Europeana API

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List of abbreviations

AA:	archaeological / architectural sites
API	Aplication Programming Interphace
EDM:	Europeana Data Model
EPSG:	European Petroleum Survey Group (now OGP Geomatics Committee)
ESE:	Europeana Semantic Elements
IPCHS:	Institute for the Protection of Cultural Heritage of Slovenia
GIS:	Geographic Information System
WMS:	Web Map Service
WFS:	Web Feature Service
WGS84:	World Geodetic System 1984

1 Executive summary

Geographic location is one of the most important attributes of every cultural heritage item. It can describe provenience, the current institution, the location of the event or other related events. The most valuable geographic description is in the form of digital geographic coordinates. Geographic coordinates presented as x, y and possibly z-values define a position in a coordinate system. The added value of the geocoded cultural content is in the browsing of cultural portals efficiently through space and time, searching for content in a more user friendly way, without the necessity of typing geographical names, making it possible to discover overlapping cultural content at the same location but originating from different sources and at different times, mapping the cultural content, performing GIS calculations and simulations, overlapping architectural/archaeological heritage with museum objects and intangible heritage, defining the protected areas of monuments, geo-visualisation and historical simulations.

This deliverable D 4.7 "Map enhancement to project website using Europeana API" describes the web application CARARE-mapping http://carare.eculturelab.eu.

The objective of the CARARE-mapping web application is to demonstrate the functionalities and advantages for displaying and browsing digital cultural content if a user interface is a map. The CARARE-mapping web application proves the mapping as an added value for re-use of Europeana cultural content.

The CARARE-mapping web application is in a prototype phase and consists of four main components:

- mapping,
- route planning,
- mobile,
- search.

The pilot data will consist of all CARARE data ingested to Europeana, either with "exact" geographical coordinates or geoparsed ones. CARARE data was still in the process of being published in Europeana at the time of writing this report. 1,488,988 digital objects are displayed on the map.

This report complements the Report D 3.5 Report on Europeana GIS services and archaeology /architecture site data, December 2011.

2 Introduction

The report, Map enhancement to project website using Europeana API presents work on Task 4: Geographic information and APIs as part of WP4 Harvesting and aggregating.

Functional requirements for CARARE mapping web application were:

- to display where digital cultural objects are “located”,
- to search Europeana collections and find the location of selected digital object,
- to use the application also on mobile devices,
- to demonstrate the use of the application in cultural tourism,
- simple and user friendly interface,
- integrated hyperlinks to contexts of Europeana and National level,
- to be a companion of the main CARARE web site.

Technological requirements for development were:

- use of open source software,
- use of Europeana search API,
- use of technological components used in Europeana ICT as much as possible,
- possibilities of use in several web browsers “without” exceptions.

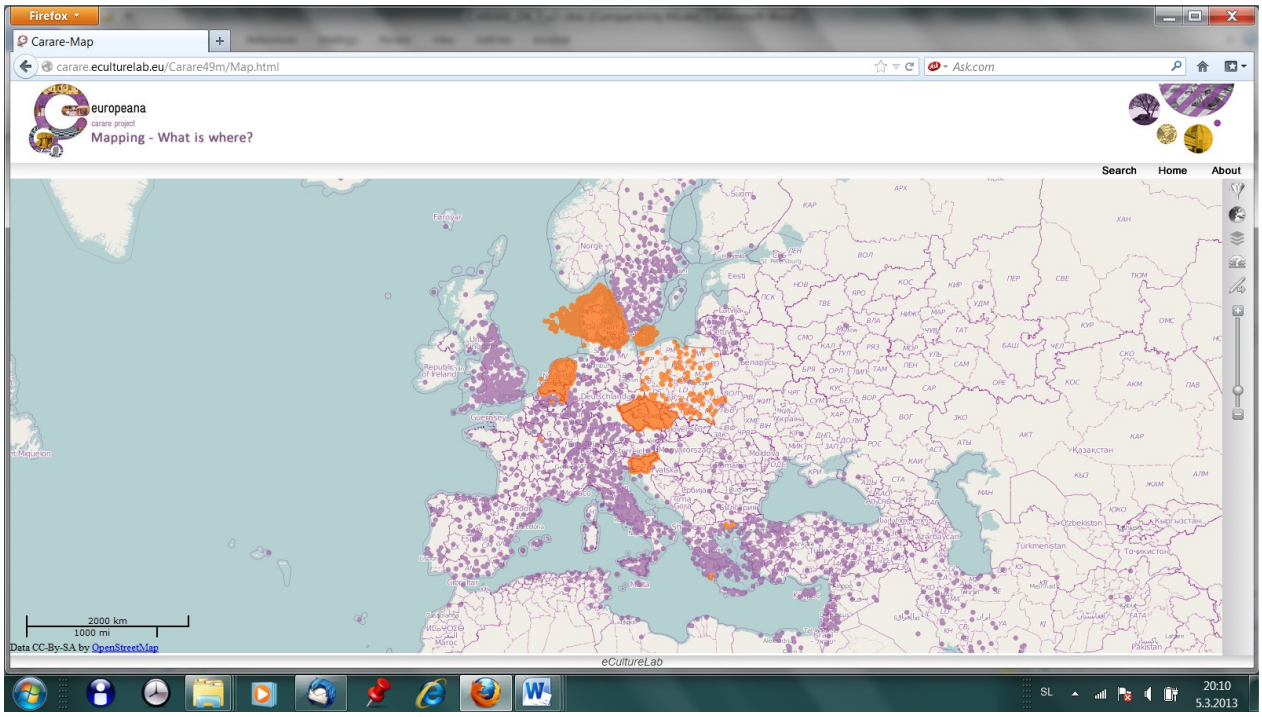
In next chapters the following components are described:

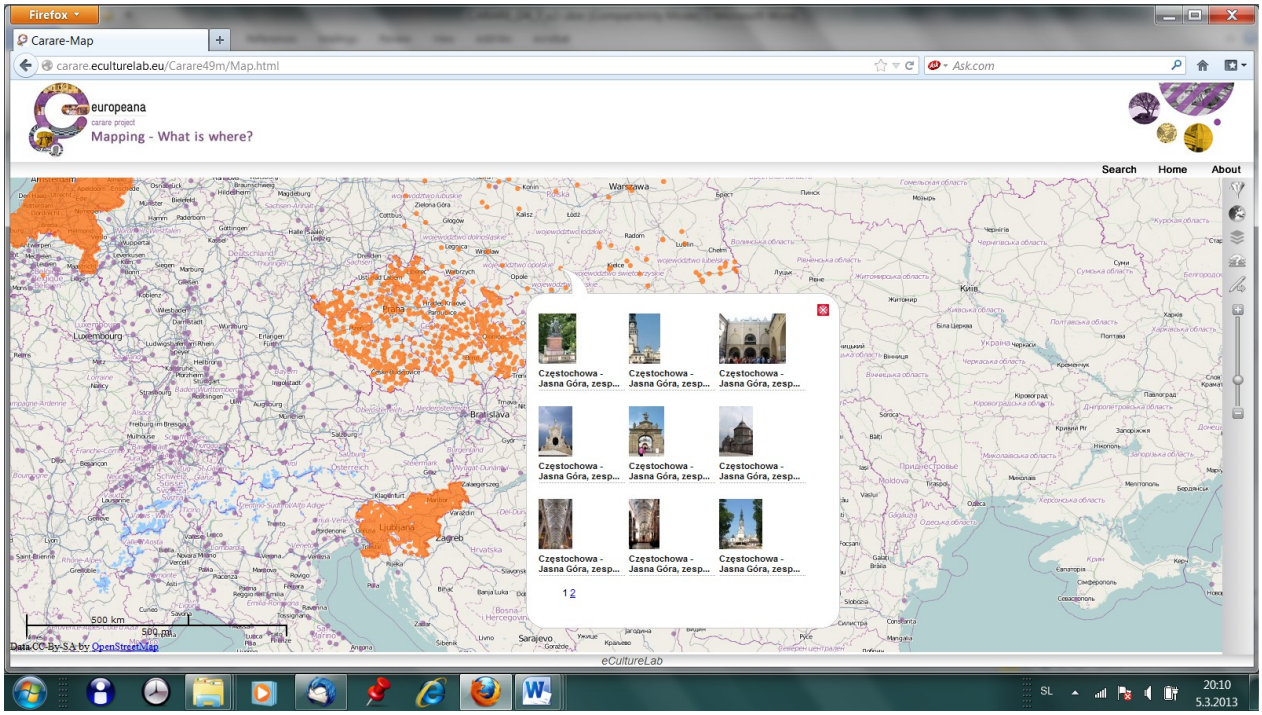
- map component; basic component for display the interactive map,
- route planning component; simple tool for collecting data along the selected route,
- mobile component; enable locational service,
- search component; searching Europeana collections and display “Where is what?”

3 Map component

3.1 Goal

The goal of the map component is to display and enable spatial browsing among all CARARE digital objects and therefore to answer to the main question: “What is where?”





3.2 Features

- GIS functions zoom to all, zoom-in, zoom-out, pan.
- Changing of the base layer (available: Google Physical, Open Street Map, Google Satellite, Google Streets, Google Hybrid).
- Showing the thumbnails of digital objects on selected location.
- Hyperlinks to detail description of object in Europeana and/or National level.
- Filter the heritage displayed on a map (multilingual option: synchronic translation of filtering term into native languages).

3.3 Implementation

Map component is an internet application developed and implemented:

- by using Openlayers 2.12 OpenSource software on client side,
- by using IIS 7 with .NET framework 3.5, Java JRE 6, Geoserver 2.2, PostGIS 2.0, PostgreSQL 9.2 driver on server side.

Prototype data base consists of point spatial features in two types of spatial accuracy:

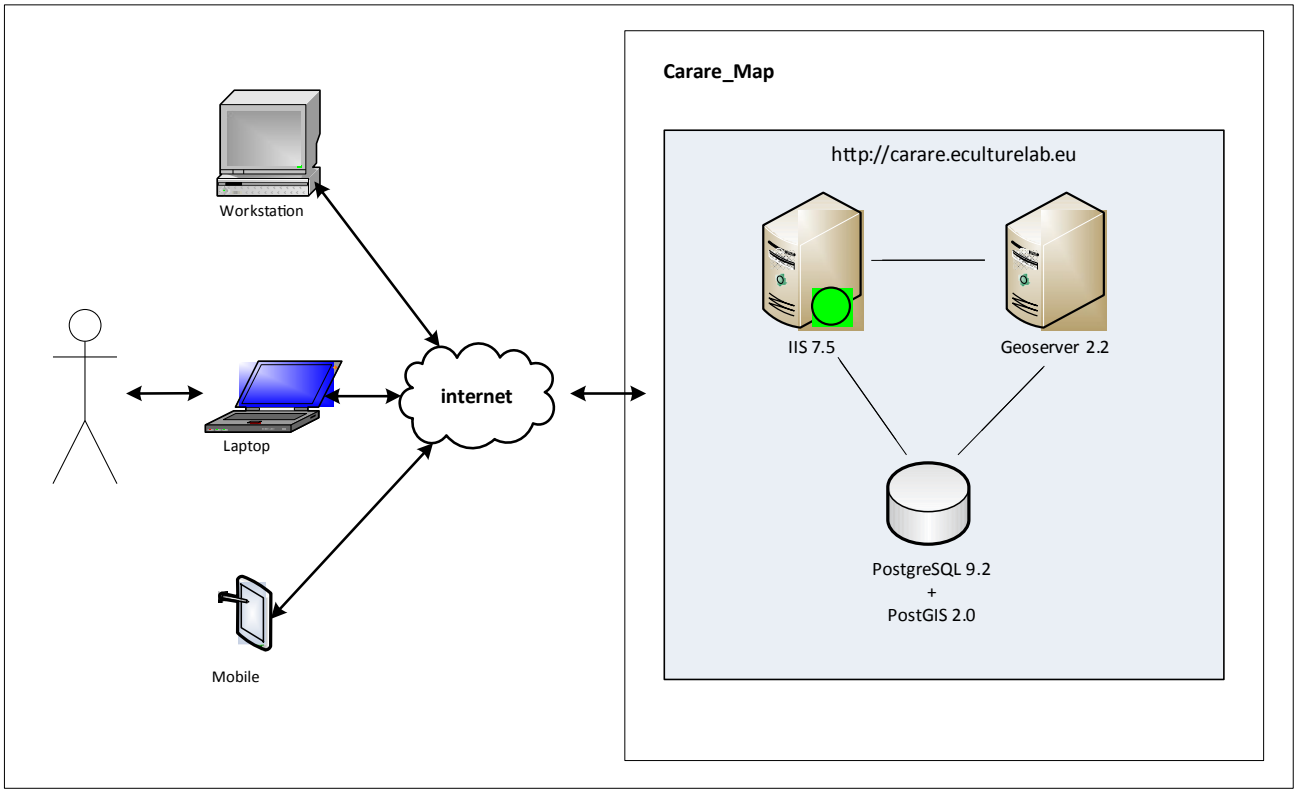
- below 5-10 meters in real world,

- above 10 meters.

The following attribute data are connected with point spatial features:

- title of digital object,
- provider of digital object,
- hyperlink to thumbnail of digital object,
- hyperlink to national context of digital object,
- hyperlink to Europeana context of digital object,
- level of spatial accuracy.

The pilot data will consist of all CARARE data ingested to Europeana, either with "exact" geographical coordinates or geoparsed ones. Currently 1.488.988 digital objects are displayed on the map (February 2013).



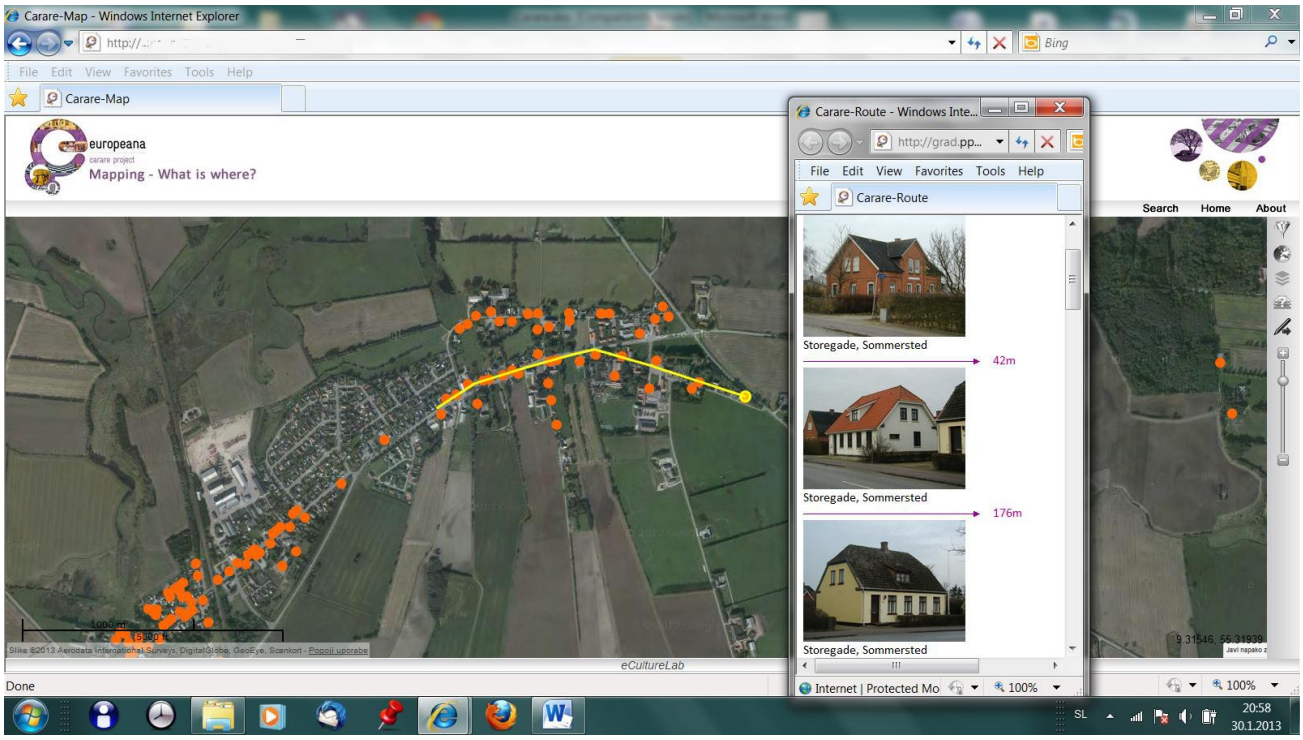
3.4 Discussion

- Caching of maps is used for some upper levels of detail.
- Number of displayed spatial features is not limited because mapping is executed on server side.
- Spatial database and spatial server are used in order to optimize performance of interactive mapping.
- The real use of this map is in the areas where the CARARE objects have spatial accuracy appropriate for navigation.
- The filter performs a selection on basis of the titles of cultural heritage objects.
- The automatic translation from English to other languages is provided.
- Currently the English filter phrase is translated to Slovenian, Swedish, Lithuanian and Danish language by using Microsoft Translator V2 API (http://msdn.microsoft.com/en-us/library/ff512423.aspx).
- Tested in following browsers: Internet Explorer v.8 and 9, Firefox v.16, v.17 and v.18, Chrome v. 23 and v. 24, Safari v.5, Opera v.12.

4 Route component

4.1 Goal

The goal of the route component is to provide simple route planning with information and pictures of cultural objects along the route.



4.2 Features

- Digitalization of the route.
- Self-generated display of digital objects along the digitized route with distances and links to detail information on content provider sites.

4.3 Implementation

The tool is implemented by two services:

- digitization of route points on the client, and
- calculation of the spatial buffer around the digitalized route.

4.4 Discussion

- The route component is a simple tool to gather the information (texts, images, 3D models) on CARARE objects nearby selected location.
- The tool could be further developed to implement some filters and options.
- A current limit of one route is 100 digital objects.
- Current default value of spatial buffer around the route is 20 meters.
- The tool could be used in real time when travelling by bus, car or walking and using mobile device. Especially recommended for mobile tablet.
- The tool could be used also when preparing the route and saving the data on cultural objects along the path.

5 Mobile component

5.1 Goal

The goal of the mobile component is to customize general web application for user-friendly use on mobile devices.

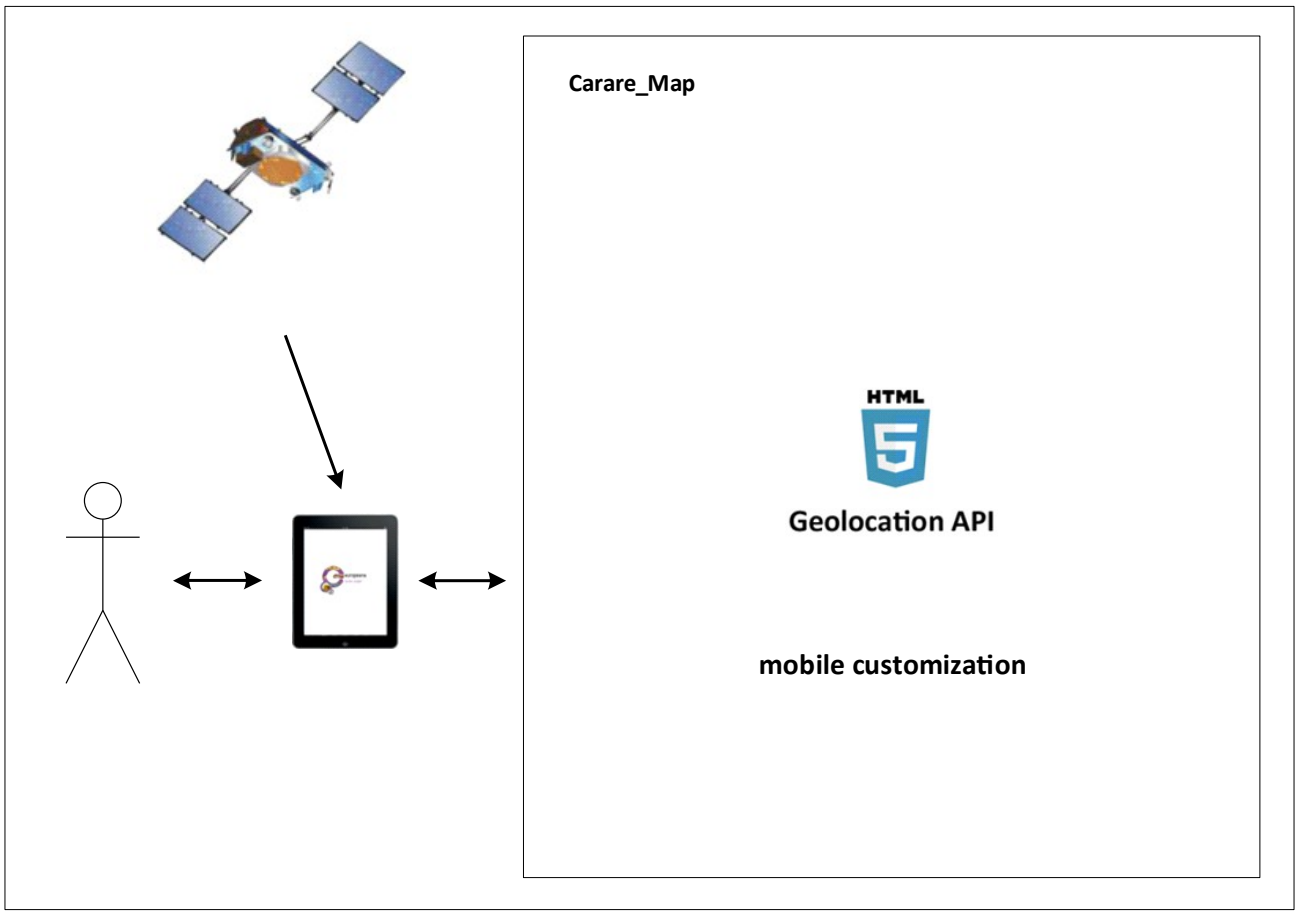
5.2 Features

- Using geolocation services.
- Enabled customisation for mobile devices.
- All functionalities of map, search and route planning component.

5.3 Implementation

When web application recognize mobile device it tries to:

- find the current location of user by using Html 5 Geolocation API and,
- enables route planning as a default tool.



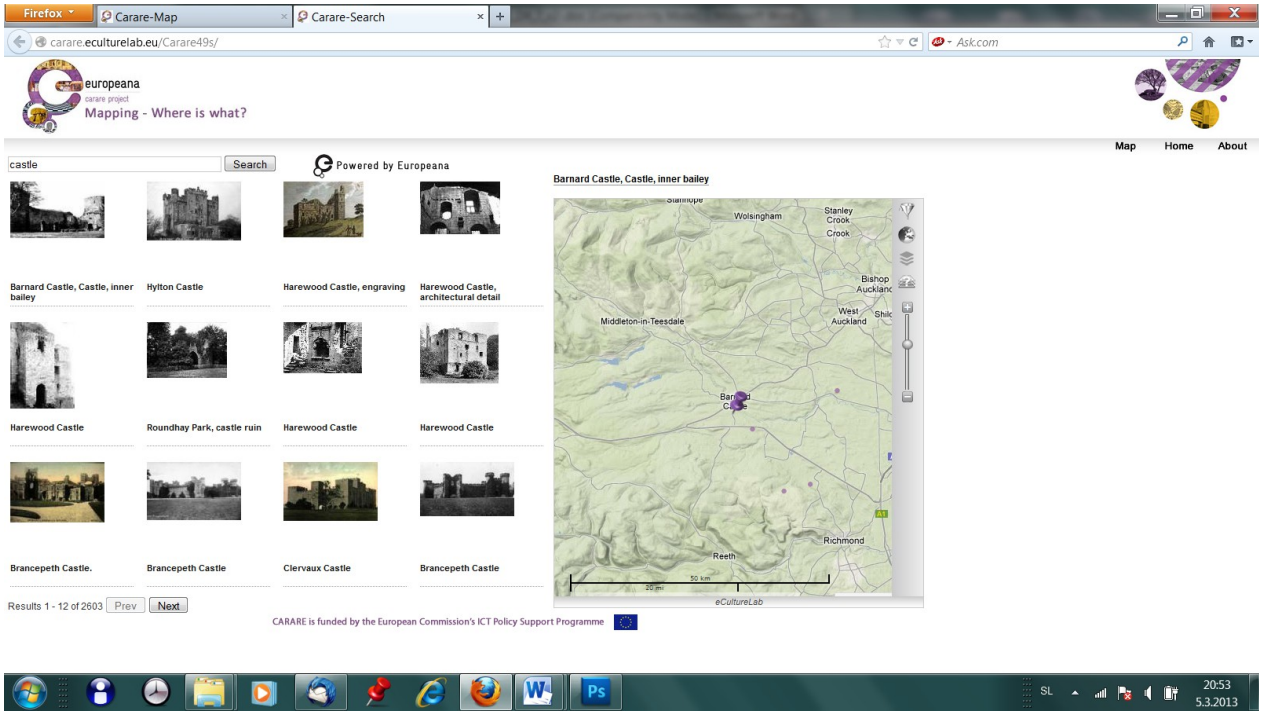
5.4 Discussion

- The mobile component is especially useful for using on tablet devices.
- Tested in the following browsers: Mobile Firefox v.18, Android browser v.4.0.3 and v.4.1.2.

6 Search component

6.1 Goal

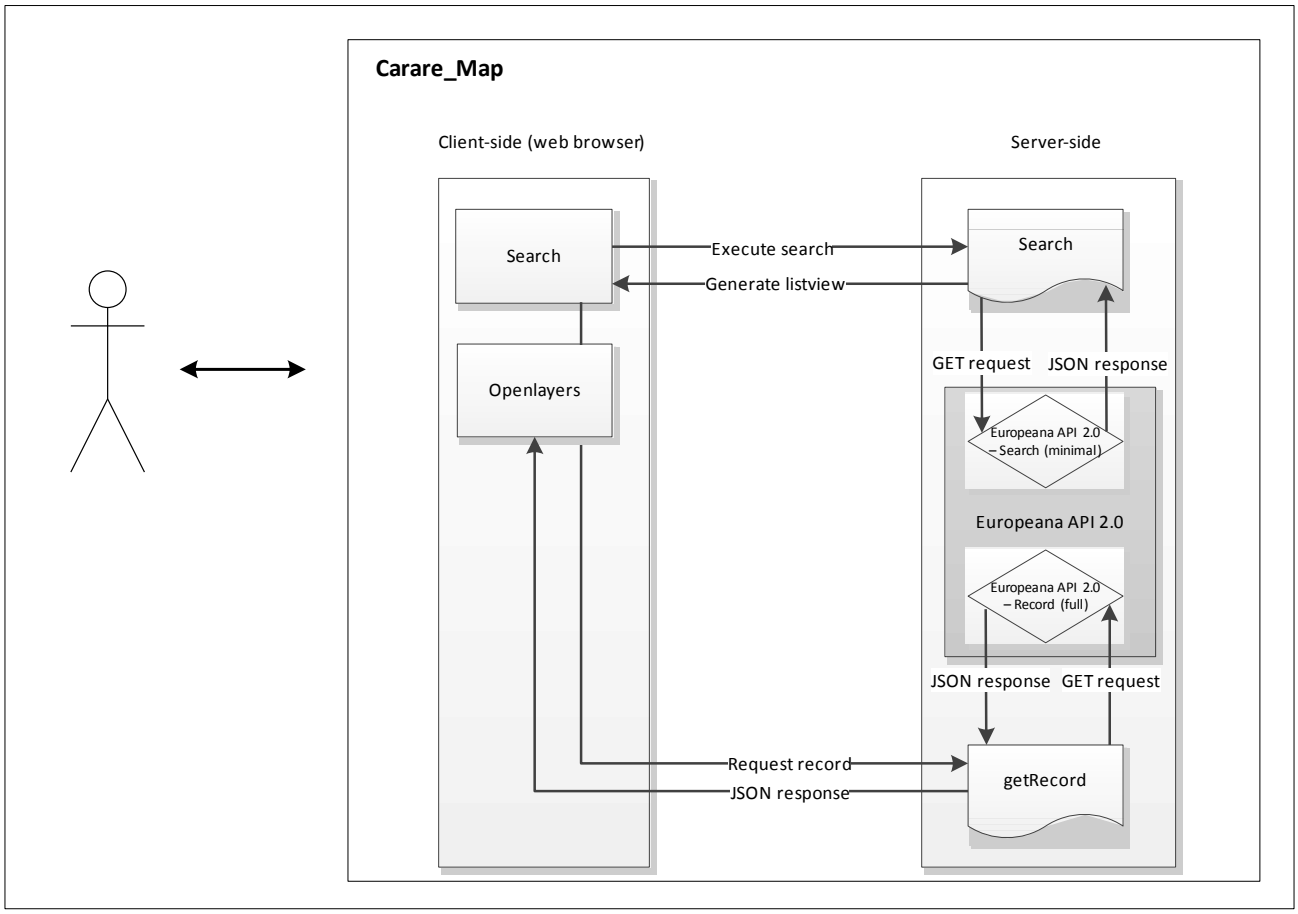
The goal of the search component is to search Europeana and present the location of the selected object on the map.



6.2 Features

- Searching Europeana content.
- Displaying all search results on a grid of thumbnails.
- Displaying the location of selected item on a map with a link to detail information on Europeana portal.

6.3 Implementation



6.4 Discussion

- Europeana search API 2.0 is very efficient tool for searching Europeana collections. Currently the tool is using Europeana prototype database.
- Europeana search API 2.0 is a fast service, with usual response less than 0.5 seconds. It is based on Lucene technology.
- The location on the map was initially estimated on geoparsed coordinates, geoparsed by Europeana.
- Geoparsed coordinates were later exchanged with “exact” ones for CARARE objects.

7 Instructions for use

Web-based mapping of CARARE archaeological/architectural sites is developed in order to evaluate re-use of Europeana meta data (Deliverable D.4.7: M*ap enhancement to project website using Europeana API*). The content of the map are collections already delivered to CARARE repository and Europeana.

Spatial accuracy: ● 5 m or less ● other

The tool supports navigation and search of the content:
- to move the map press either left or middle mouse button while over the map and drag;
- to change the magnification use the mouse scroll wheel or the magnification tool on the right sidebar; you can also hold a shift key while drawing a rectangle with the left mouse button to zoom-in;
- to identify features use the left mouse button and click on them, then select the thumbnail to connect to Europeana meta data.


Filtering the heritage on the map according to term. When multilingual option is checked enter the term in english and it will be automatically translated into other languages.


A tool for for planning the cultural route. Click the points on the map and end the route by double-click.


Zoom the map to full extent.


Select base layer:

- Google Physical
- Open Street Map
- Google Satellite
- Google Streets
- Google Hybrid


Zoom tool.

Search Search Europeana content and find geographical location of selected object.

The tool could be efficiently used also on mobile devices with additional locational and navigation features.

8 Conclusions

- The prototype proves the efficiency of geographical map user interface for Europeana and other cultural portals.
- CARARE digital objects are architectural and arehologital sites and are usually »exactly« located and therefore very usefull for navigation.
- Geographic coordinates of architectural and arceological sites could be used for enrichments of spatial location of movable (e.g.museum) cultural objects.
- Enhancement of project website with map cleary shows the overview of ingested content within the project and enables simple browsing and discovering the content.
- The use of attribute filter on the maps needs translation to different languages, otherwise filter has very limited use.
- Map tool must be enabled for use on mobile devices (phones and tablets). Use of customized general web aplication is sufficient for the beginning.
- The route-planning tool could be used in real time when travelling by bus, car or walking and using mobile device. Especially recommended for mobile tablet.
- Europeana search API 2.0 is very efficient tool for searching Europeana collections and for the use with map user interface.

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