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A context aware mobile GIS: design, architecture and first implementations

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A context aware mobile GIS is being implemented for a current Italian national research project, which has the aim to exploit informative and geomatics technologies

for exploring archaeological contexts. This project is carried out by the Laboratorio

di Geomatica of Politecnico di Milano/Polo Regionale di Como and CEFRIEL (ICT Center of Excellence For Research, Innovation, Education and industrial Labs partnership).

In particular, the mobile GIS we are talking about is thought for the context of Comum Oppidum, a pre-roman archaeological site within the Italian Regional Park of Spina Verde, near the Como town (Northern Italy).

It is a client-server web application running within a Tomcat servlet container. It is composed by three parts: a proper mobile GIS, a context-aware platform and a servlet filter which manages and integrates them.

The mobile GIS is a servlet implemented with Java Mapscript, generates XHTML web pages improved by JavaScript and loads ESRI shapefiles, MapInfo .TAB files and data coming from a PostgreSQL/PostGIS DBMS.

The context-aware platform adapts the service according to user position, objects of interest localisation (location server), used devices, contrast/brilliance and contents deepening.

The servlet filter has been thought to give these properties to the mobile GIS. At the moment, only two of them are being integrated in the mobile GIS; they are the user position and the objects of interest real-time visualisations. The other ones will be treated in future developments of the project.

The user position real-time visualisation is made by drawing on the map the coordinates of the user, coming from a GPS receiver associated to the handled device which the user accesses the mobile GIS by. The localisation of objects of interest is

made by RFID (Radio Frequency IDentification) targets, which send the coordinates and

other information of these objects to the application.

In order to correctly draw the GPS user position in the map, the geographic reference

system is WGS84 now. However, in a future version of the application it will be replaced by the Italian Gauss-Boaga system and the GPS position will be drawn on the map after an on-the-fly conversion from WGS84 system, provided by a service that will

be implemented expressly.

At the moment, the context aware mobile GIS has basic map browsing and feature query functionalities, table of contents (HTML legend), reference map, scalebar and - we said - manages data coming from GPS receiver and RFID targets.

Other functionalities, like query by attribute and zoom by rectangle, will be added in the next months.

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