From field data collection to earth sciences dissemination: mobile examples in the digital era

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In the framework of the technological and cultural revolution related to the massive diffusion of mobile devices, as smartphones and tablets, the information management and accessibility is changing, and many software houses and developer communities realized applications that can meet various people's needs. Modern collection, storing and sharing of data have radically changed, and advances in ICT increasingly involve field-based activities. Progresses in these researches and applications depend on three main components: hardware, software and web system.

Since 2008 the geoSITLab multidisciplinary group (Earth Sciences Department and NatRisk Centre of the University of Torino and the Natural Sciences Museum of the Piemonte Region) is active in defining and testing methods for collecting, managing and sharing field information using mobile devices. Key issues include: Geomorphological Digital Mapping, Natural Hazards monitoring, Geoheritage assessment and applications for the teaching of Earth Sciences. An overview of the application studies is offered here, including the use of Mobile tools for data collection, the construction of relational databases for inventory activities and the test of Web-Mapping tools and mobile apps for data dissemination.

The fil rouge of connection is a standardized digital approach allowing the use of mobile devices in each step of the process, which will be analysed within different projects set up by the research group (Geonathaz, EgeoFieldwork, Progeo Piemonte, GeomediaWeb). The hardware component mainly consists of the availability of handheld mobile devices (e.g. smartphones, PDAs and Tablets). The software component corresponds to applications for spatial data visualization on mobile devices, such as composite mobile GIS or simple location-based apps. The web component allows the integration of collected data into geodatabase based on client-server architecture, where the information can be easily loaded, uploaded and shared between field staff and data management team, in order to disseminate collected information to media or to inform the decision makers.

Results demonstrated the possibility to record field observations in a fast and reliable way, using standardized formats that can improve the precision of collected information and lower the possibility of errors and data omission. Dedicated forms have been set up for gathering different thematic data (geologic/geomorphologic, faunal and floristic, path system. . . etc.). Field data allowed to arrange maps and SDI useful for many application purposes: from country-planning to disaster risk management, from Geoheritage management to Earth Science concepts dissemination.