Mapping a city's activity. A project of volunteered geographic information using mobile mapping collection

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Extended Abstract

The work done deals with volunteered geographic information, based on a mobile mapping collection tool to retrieve geographical data from an urban fieldwork.

The research has been carried on during the past academic year, involving students from the course of Geography of Networks, within the post graduate degrees in 'Economics' and 'Business' of the University of Trieste (Italy). In this framework the aim was twofold. On one side the idea was testing the potential of crowdsourcing in retrieving data following a bottom up approach, relying on a set of trained and aware 'urban sensors' as data collectors for some particular urban phenomenon. On the other side the aim was deriving first-hand geographical data concerning a particular topic and analyze its spatial distribution in space by means of Geographical Information Systems and spatial analytical tools. In this case this was represented by the urban 'movida', or the analysis of the areas of the city that are more or less active during the days (nights!) and during the week. This major aim was also coupled with an ancillary one, that is the coverage of wi-fi hotspots and networks over the urban area of Trieste. It is known that many Italian cities still do not allow a very wide coverage of wireless networks allowing people to access the Internet. The city of Trieste is suited with a certain degree of coverage, particularly in main roads and squares, both in terms of the free

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wi-fi coverage managed by the municipality as well as the academic network of Eduroam system, quite spread over European and world cities hosting universities and research centres.

Neogeography and VGI. The rationale behind the project deals with the phenomenon of Volunteered Geographical Information (VGI), as coniated by Goodchild (2007) that, as a particular case of Neogeography (Turner, 2006; Graham, 2009; Warf and Sui, 2010) sees the involvement of citizens in collecting geographical data, as a particular case of user-generated content. In this field one can find examples including OpenStreetMap, Google Earth or Wikimapia as results of the 'democratization' of GIS in last decades allowed by the spread of Internet and low cost devices, as large scale projects involving the participation of volunteers. Other examples include the use of citizens over specific projects over a certain amount of time or the use of finalized user groups to target some specific issue. The applications are wide and generally deal with public utility projects on environmental or social issues, as well as humanitarian ones. These latter motivations are particularly interesting as many free and open source projects and platforms have been developed. That, coupled with the widespread use of smartphones and tablets and Internet connection allows easier and faster data collection and sharing.

The choice of the mobile data collection kit – GeoODK app. We were searching for low cost and low skill requiring solutions in order to be used for a research involving students and with a minimum effort in programming and customizing IT component, the aim being on focusing on the social aspects of the project and therefore in order to leave us time and resources to concentrate over the kind of data to be collected. After several tests we approached the Open Data Kit environment and appreciated very much its structure and application. The ODK Collect app was therefore tested as a tool for mobile data collection, given the high possibilities of customizing its content according to different projects.

We decided to use an advanced version of ODK, as GeoODK, an open source platform created by the University of Maryland and International Institute of Applied System Analysis that is composed of two parts. On one side, one can download the mobile application GeoODK Collect that runs on Android smartphones that can be also used in offline mode. on the other side there is a web system (Formhub or ODK Aggregate) that aggregates data, lets you visualize on the screen the map of data, modify or delete data or export data in CSV, KML or XLS files.

In addiction, for those who do not have a smartphone or have a different operative system running (such as iPhone-users or Windows-users) the web

system allows to collect data using a web form of the survey (using Enketo Smart Paper).

The creation of form can be designed with an Excel file that must be composed by two worksheets, needed to set up the parameters of the forms: one is 'survey' and the other is 'choices'. After loading the file in the Formhub account one have, just for the first time, to set the app settings to download the form to start collecting data.

The choice of the volunteered and sensors. Students from post graduated courses. As this study of the "city's activity" emerged as an applicative example of the study of "Geography of networks" within the post graduate degrees in 'Economics' and 'Business' of the University of Trieste (Italy), we decided to involve the student of this course, suitably trained by the authors through a small presentation to use the mobile application or the web form available thanks to Enketo Small Paper.

affollamento_evento string	data_ora date	descrizione string	geolocalizzazione string	immagine_evento string	indirizzo_evento string
scarsa	2015-07-15T14:15:00Z	Prova	45.659437 13.794006 0 0		Via A. Valerio 4/1
scarsa	2015-07-15T11:52:00Z		45.6548151 13.7877466 0.0 43.5		Via ricci - via cologna
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discreta	2015-07-13T21:08:00Z		45.652028 13.780975 0 0		Viale xx settembre
buona	2015-07-14T15:30:00Z		45.653888 13.783379 0 0		Giardino pubblico Tommasini
scarsa	2015-07-14T16:11:00Z		45.654499 13.786302 0 0		Via cologna vicino al giardino pu
buona	2015-07-14T14:23:00Z		45.652023 13.780804 0 0	1436883890713.jpg	Pane quotidiano viale xx settem
scarsa	2015-07-13T18:38:00Z		45.654428 13.791361 0 0	1436812832295.jpg	Fine del viale xx settembre zona
scarsa	2015-07-14T17:34:00Z	Prova	45.6547187 13.787622 0.0 36.0	1436895338703.jpg	Via Ricci

Figure 1. A screenshot of the table visualization of the collected data

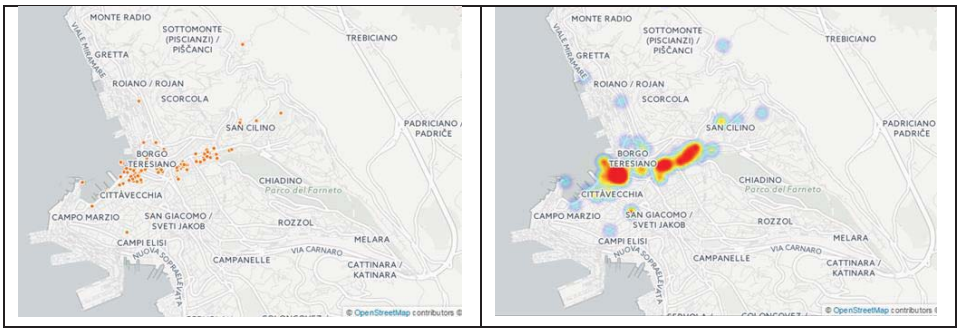

Figure 2. Map view of the data collected and a density map of the event data of Trieste's Movida

In addiction, an advertising campaign on Facebook was made, together with the creation of a Facebook page "Data collection about movida and free wi-fi in Trieste". The data collection campaign took place during the summer period and involved volunteers in mapping places in the city of Trieste, stating the presence of public or private wi-fi network, as well as he level of 'crowdness' in the venues considered. These two elements were considered interesting to be studied, in order to map places where people actually move in different days and times of the year, as well as understanding the level of coverage of the wi-fi network. These elements were considered interesting both for experimenting visualization techniques and also to provide local authorities with a set of information on where to address investments in wi-fi development and coverage according to the presence of users.

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