Applied Open Linked Data: A Mobile Solution for Galway Volvo Ocean Race

Abstract. *Open Linked Data* is considered to improve policy making transparency and one of the key tools to ensure good state and local government information dissemination. Last decade we observed a number of initiatives concerned about opening up governmental data and publishing the data in a widely available formats. Even though these data sets are being unleashed many of them are missing use-cases, therefore do not present a real value to the public. In this paper we present a solution that utilize governmental data in order to support visitors of Galway City coming for the Galway Volvo Ocean Race event.

Keywords: open data, linked data, mobile app, governmental data

1 Introduction

Volvo Ocean Race Galway[1] (a part of Volvo Ocean Race[2]) is an important event, having significant impact on Galway and Ireland. In 2009, Volvo Ocean Race Galway economic impact has been estimated at 55.8m where 36.5m of spending by race spectators from outside the local region[1]. The event brought 650,000 spectators to Galway City of population only 75,000 people. That large amount of visitors need a good information and proper guidance in order to ensure comfortable and enjoyable stay in Galway during the event. We present a mobile app that leverages Galway City and Galway County data sources in order to provide relevant information on points of interest and key infrastructure of the City of Galway. We believe our app will help visitors coming to Volvo Ocean Race Galway event to effectively move around the city and increase awareness of services available.

2 Informer Mobile Solution Architecture

Informer Mobile Solution has been designed as an Android[3] platform based online mobile application. The Solution utilizes a remote online RDF Store as the data backend filled with a data coming from Galway City and Galway County data resources (Fig. 1).

[1] http://www.volvooceanracegalway.ie/
[2] http://www.volvooceanrace.com/
[3] http://www.android.com/

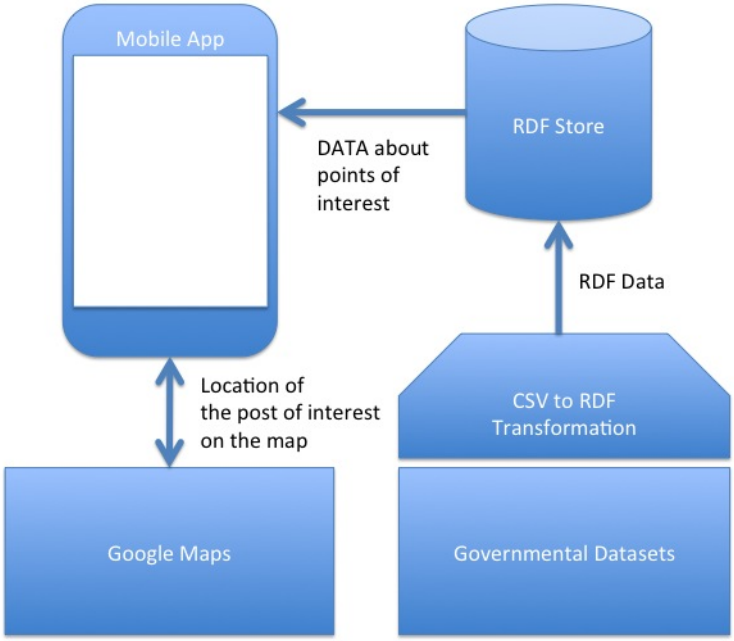

Fig. 1: Informer Mobile Solution Architecture

2.1 Data Preparation

Open Data is aspiring to increase transparency and supports participation[3]. The Open Data provided by the government publishers has been released mainly as CSV[4], Excel and KML[5] files. These data formats are missing semantics necessary to effectively combine data with other valuable information, therefore it is impossible link it, as is, to the Open Linked Data Cloud[2]. In order to achieve the relevant level of information we had to apply a proper transformation of the data. For the purpose of the project we have used RDF (Resource Description Framework[6]) standard as the metadata model. We have covered the necessary vocabulary by well established ontologies like RDF Schema[7], Dublin Core[8] and Geo[9](Fig. 2).

[4] http://en.wikipedia.org/wiki/Comma-separated_values
[5] https://developers.google.com/kml/documentation/kml_tut
[6] http://www.w3.org/RDF/
[7] http://www.w3.org/TR/rdf-schema/
[8] http://dublincore.org/
[9] http://www.geonames.org/ontology/documentation.html

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  - <rdf:Description rdf:about="http://www.derivolvo.com/sports/1">
      <rdf:type rdf:resource="http://www.derivolvo.com/SportFacility"/>
      <rdfs:label>Cappagh Park</rdfs:label>
    </rdf:Description>
  - <rdf:Description rdf:nodeID="node16rno4pdtx1">
      <geo:lat rdf:datatype="http://www.w3.org/2001/XMLSchema#double">53.2644254944991</geo:lat>
      <geo:long rdf:datatype="http://www.w3.org/2001/XMLSchema#double">-9.13414422681182</geo:long>
    </rdf:Description>
  - <rdf:Description rdf:about="http://www.derivolvo.com/sports/1">
      <locn:geometry rdf:nodeID="node16rno4pdtx1"/>
      <dct:subject>sports</dct:subject>
    </rdf:Description>
  - <rdf:Description rdf:about="http://www.derivolvo.com/sports/3">
      <rdf:type rdf:resource="http://www.derivolvo.com/SportFacility"/>
      <rdfs:label>Cappagh Park</rdfs:label>
    </rdf:Description>
```

Fig. 2: RDF Code

2.2 Datasets Used

The datasets that we utilized for the Informer solution has been published by Galway County and Galway City Council. The City datasets include: Arts, ATMs, Blue Badge Parking, Car Parking, Latin Quarters, Museums, Parks, Playgrounds and Sports Facilities. The County datasets include: Piers and Harbors, Beaches and Buildings.

2.3 Data Exploration

The RDF graph build on top of governmental data collected has been deployed on specially prepared server with Virtuoso RDF Store[10]. The store provides SPARQL[11] endpoint enabling remote RDF graph exploration necessary for the Open Linked Data operations. The mobile app uses online connection on users's demand to fetch information directly from the RDF store.

2.4 Data Visualisation

To present the data collected in a user friendly way we have used Google Maps API[12]. The information about the points of interest (Fig.3) and Galway City Infrastructure is placed on the map (Fig. 4) based on the coordinates extracted from the datasets.

2.5 Functionalities

The interface enables to look for places in particular radius around our current location. The current position is based on phone GPS sensor reading. The user

[10] http://virtuoso.openlinksw.com/rdf-quad-store/
[11] http://www.w3.org/TR/rdf-sparql-query/
[12] https://developers.google.com/maps/

can type in the item of interest and pickup the radius for the nearby points of interest search (Fig. 5).

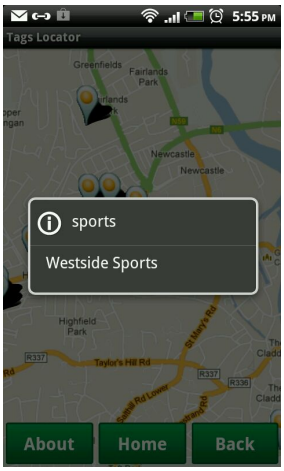

Fig. 3: Informer Mobile Solution Architecture

Fig. 4: Google API Based Visualisation

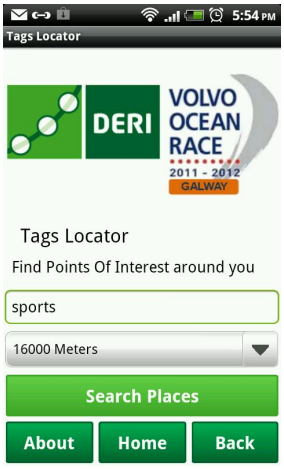

Fig. 5: Main App Screen

3 Discussion

The application is expected to help the vast masses of visitors coming to Galway to navigate in the city and to find desired services. Even though the application

has been designed for the particular event and in the particular context, it can be easily moved to other level (national) or prepared for another region or context. Also the datasets domain can be expanded or changed dependable on the context of the application deployment.

3.1 Limitations and Future Work

In future we would like to expand the data sets we are using with external sources. We also intend to provide more global service for Ireland, including much more open government data, not focusing only on Galway area. Future work will include development of the mobile app on other popular platforms like iOS (iPhone) and possibly other systems using PhoneGap[13] universal framework. The technology we would like to migrate to ultimately is HTML5[14] + CSS in order to provide maximum portability. The future development will include also improvements in user interface and gathering user data in order to provide personalized recommendations.

4 Acknowledgements

This work has been supported by Science Foundation Ireland under grant number SFI/08/CE/I1380 (Lion 2) and the Cloud4SOA FP7 ICT Project under grant 257953.

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[13] http://phonegap.com/
[14] http://en.wikipedia.org/wiki/HTML5