OpenStreetMap standalone server as a core of system for environmental data publication for wide public in Ireland

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Abstract. In this paper is possible to find info about system developed by EPA Environmental Protection Agency and NUI[3] Maynooth for presenting environmental data collected by EPA in graphical easy to understanding for wide audience form, with focus on showing them especially on simple mobile devices like most basic telephones with Java Mobile edition on board.

Key words: OpenStreetMap, Mapnik, Environmental Research Data, Open Access, Mapping, Ireland

1   Introduction

In Ireland data which governmental institutions are collecting during his statutory duties are widely and cost free available for public. Which institutions is oblige to make accessible is described in Governmental Freedom of Information Act from 1997 [State, 1997] created by *Tithe an Oireachtais -(Irish Parliament).* Most significant and visual form of this governmental act are special rooms in this institutions where all this reports, tables etc. are stored in folders on bookshelves. Anyone can arrive there and browse this data because as if this informations was created with use of tax payers found they should be available for general public. Of course this type of access to data is not the most suitable one. That is why all this data and even more are primary available in electronics form provided trough web pages of EPA. The form of this informations that are databases sets, Raw data, Spreadsheet tables and even complete reports in pdf files. That is suitable for researchers and determined to dig inside persons who exactly now what they looked for and are ready to spend some time during this search. This work is intended to fill this gap and bring a deep web content which as [Gruchawka,] says "Most of this information is contained in databases and is not indexed by search engines" for a wide society of usual citizens. People are care about this data but rather they d'like to have access to them in simply

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maner without deep diging like for example to weather forecast. If this informations will be in this simple form available we will be certain that the idea of easy access to public data representing significantly by "public rooms with folders" is implemented in best actual technically possible way and probably my increase a public awareness on environmental informations. Citizens will also d'like to have some useful tool which give them proof that money of taxpayer are spend on usefully research. Which can be apply by anyone even only to check what is status of environment in my neighbourhood.

2 Own openstreetmap backend and frontend with EPA data

Proposition of this system for creating context aware service which will be able show environmental data when user request them in simple maner even on very basic mobile telephones with simplest version of JavaME and small screen.

From user side that will look that when he is somewhere in Ireland with his mobile device, he starts simple Java application to be able to check in the area when he actual is for example pollution in air or what class of purity has exactly this stream which he standing nearly. Architecture of this system consist in first stage on server side service. Data from OpenStreetmap about Ireland will be copied once a week from central OSM server in the same maner like OpenCyclemap is refreshed.

Also data from EPA will be copied there to PostGIS database but in different maner they will be stored in separate tables. Rendering application Mapnik will than generating from this data a sets of tiles. There will be used a special created styles which will show on map a totally new created tags related to our environmental data. There will be created a separate sets of tiles for representing different environmental research. Tile seset with soil research on map, or water conditions embeded into styles. This pre-rendered tilesets will be a good base for simple mobile telephone application. On the end a Tilecache server runing on server will act as a distribution application for this previous prepared tiles.

Another parallel way will be prepared for more powered devices like MID laptops PDA etc. They have mostly a web browser and are able to show data in form of layers. On demand data from EPA tables will be copied and formed in form of KML files which is possible load to web service or standalone applications like Google Earth.

From client side that will be a two different applications one web based build on Open Layers designed for use on more powered devices and JavaME prepared especially for unpowered mobile telephones. Tiles prepared for mobile phones will be rendered and stored on server in svg format. Vector graphics file reduce amount of bytes which will be transfered trough GPRS network and that is why they were chosen. When user starts mobile application on his telephone first time will be need to configure some parameters. There will be a special method which will be used for clarify actual position of user in Ireland. Java2ME has a build in Location API and is able to check device position. There are two
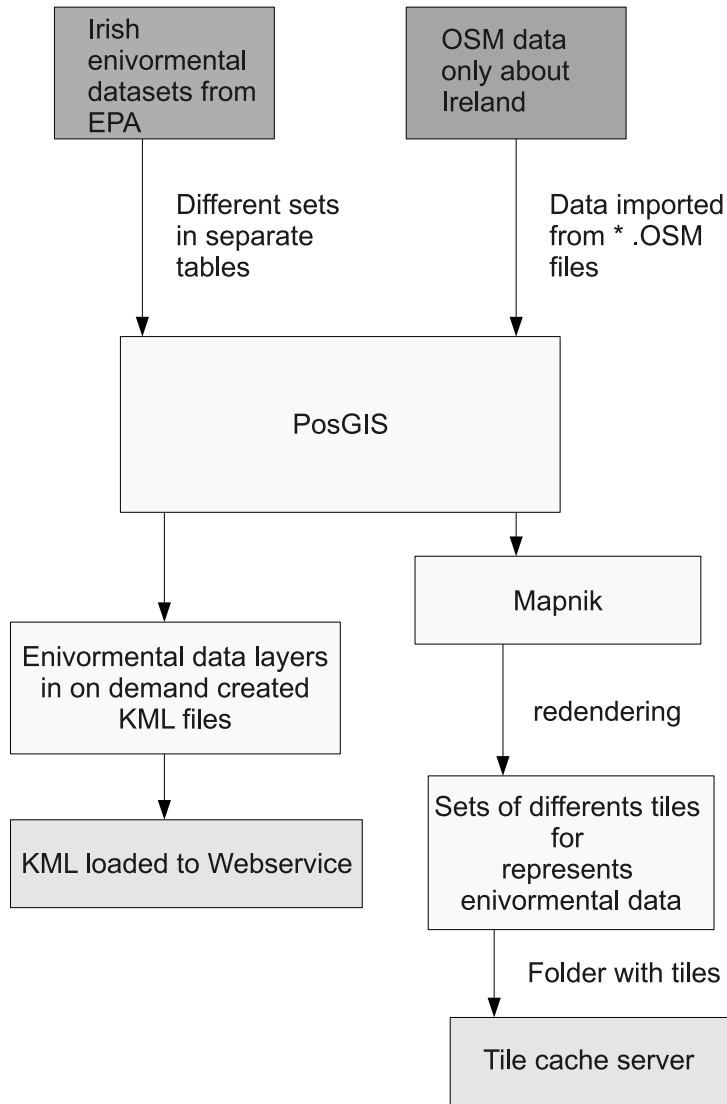
Irish enivormental datasets from EPA

OSM data only about Ireland

Different sets in separate tables

Data imported from * .OSM files

PosGIS

Mapnik

Enivormental data layers in on demand created KML files

redendering

KML loaded to Webservice

Sets of differents tiles for represents enivormental data

Folder with tiles

Tile cache server

Fig. 1. Server side Architecture

versions of this software library [Barbeau et al., 2008] as Barbeau said "JSR179 allows standardised access for J2ME applications to location data that represents the real-time position of the mobile phones". This library was interduced in year 2003 and unfortunately can only determine user position with GPS. Most telephones equiped with GPS and manufactured from 2003 to 2008 is equiped with this standard compatible localisations devices. JSR293: Location API 2.0 was interduced not so long time ago in the middle 2008 and is not so widespread like previous standard. His main advantage from point of view of this project is ability to check proximity position with GSM triangulation method if GPS is unavailable on device or there are problems with receiving data from satellite. Probably will be more popular as a standard of access to location devices on mobile telephones in near future.

For proprietary mobile phones without GPS or API 2.0 or when user shut down for energy conservation positioning system will be still possible chose position by simple input with Latitude&Longitude or with marking approximately position on simple map of Ireland. All this option about position will be there to assist people when they start application next time to show them data from area where they actual are. Program after focus on exact position will download from server tiles for nearly area and user will be able to browse trough map in similar maner like on computer. On Web based version of service will be possible use background as a standard OSM layer or chose between layers prepared for mobile devices. Than will be possibility to upload KML layers which will be interesting for user. Position of computer will be checked in three possible maners depends what user chose. First option that will be GPS device which can communicate in NMEA standard with computer there is also possible determine approximately user position by checking his IP. And last option that will be chose by hand with use of marker on map. There is possible that in near future web based version for "big" computers will be more useful for users of even mobile phones because like [Vaughan-Nichols, 2008] predict " This (mobile) type of browser—unlike its predecessor, the minimally capable microbrowser—can better work with today's interactive Web services and other powerful Web 2.0 applications". I expected that in future rather the web based version will became more popular and mobile will be used less probably for allow only simple and fast access to data.
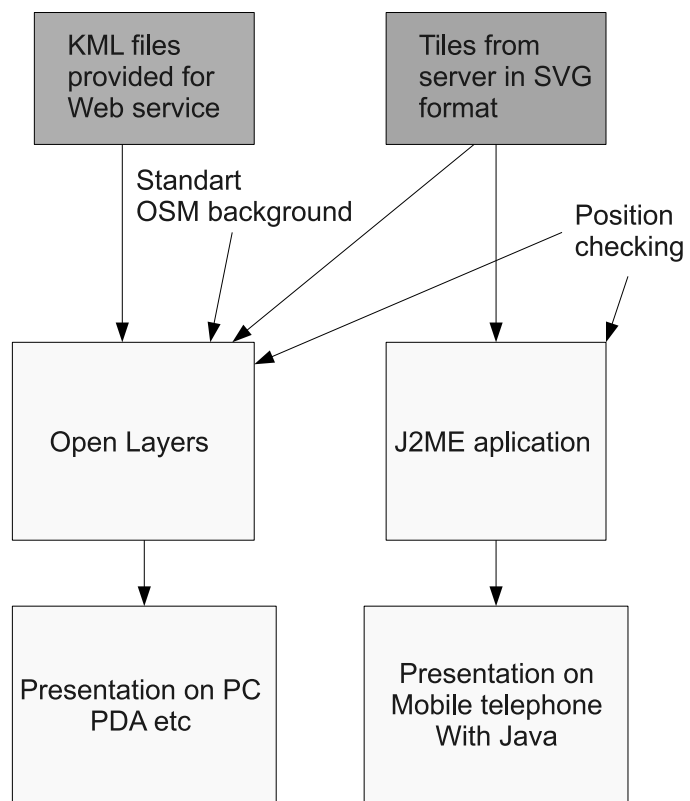
3   Acknowledgements

Fig. 2. Client side Architecture

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