

# Gov 2.0 on a (tight) budget: The case of geodata.gov.gr

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## Abstract

In this paper, we describe our experiences in applying FLOSS GIS tools and technologies for building geodata.gov.gr: the first governmental web service in Greece that offers open, public data to citizens. We will analyze the necessity for open geospatial data, the current landscape in Greece, and our approach in designing the administrative and technical aspects for creating geodata.gov.gr. Further, a breakdown of the technical components and system architecture is presented. Finally, we provide insight gained from this process, with the aim to aid other governments, public bodies, and NGOs, towards providing open data.

## Keywords

Gov 2.0, INSPIRE Directive, Open Source, GIS, open data, open government.

## 1. Introduction

The Greek Government, in less than 12 months since its election, has undertaken several ground breaking initiatives concerning transparency, accountability and participation. Accompanied with a solid structural reform, and a clear focus on budgetary efficiency, these actions stem both from *need* and *will*; the need to surpass the economic crisis and the will to establish a strong political agenda of openness.

The technical means however, i.e. budget, manpower, and legal foundations, were absent. Despite limited resources and under the close scrutiny of the international community, the Greek Government has managed to provide a plethora of open government services to citizens (e.g. [opengov.gr](http://opengov.gr), [et.diauvegia.gov.gr](http://et.diauvegia.gov.gr)), under the coordination of the Prime Minister's Office.

In the following, we describe our experiences, work and results in one of these projects, geodata.gov.gr, which has a focus on opening up the government's geospatial data.

## 2. The case of geodata

One aspect of transparency is open access to government data. Early on, we pinpointed geospatial data, as a top priority. These were our reasons:

**INSPIRE Directive.** The EU INSPIRE Directive dictates data-sharing agreements and technical measures for geodata among national and EU public bodies. The Directive lays a set of technical standards, systems, services, legislative, and organizational measures to be established for each member state. For most EU countries, the INSPIRE Directive is considered as

the next step for existing, interoperable spatial data infrastructures (SDIs). In Greece, there is not even an SDI in place.

**Forrest fires.** Forrest fires devastate Greece each year, causing great grief, damage to the environment, and financial loss (both direct, and indirect, e.g. tourism). If there was a way to aid the Fire Service in forest fighting, it should be a matter of top priority. It emerged that the Fire Service was lacking the necessary geospatial data to manage, monitor and support fire fighting.

**Sustainable development.** The path for Greece leading to economic development and growth is clear: sustainable investments that utilize and promote the country's most valuable resource, its environment. Investments in renewable energy sources, tourism, agriculture, utilities, and technological research, require a complete and accurate knowledge of environmental conditions.

## 3. Preparing a change

### 3.1 Status quo in Greece

As a first step, we conducted discussions and meetings with more than 200 civil workers, across the entire public administration. Our findings formed the basis for specific actions:

- The same geodata sets are procured by the public administration over and over again. Data sharing agreements are scarce, while the norm is considered to purchase data on (a) per case and (b) per public body license.
- Data quality, data ownership, and curation are unknown terms.
- The costs of purchasing and maintain GIS software in Greece is inexplicably high.

### 3.2 Goals vs. constraints

The goals set by the PM's Office and the Ministry of Environment were simple:

- Develop a web site to offer government geospatial data, under an open data license.
- Establish the necessary administrative and legislative instruments to introduce open geodata as a permanent government process.
- Aid public bodies in leveraging open data, i.e.: (a) provide substantial benefit (financial, operational), and (b) educate in open data practices.

The constraints set however, were significant and overwhelming:

- The timeframe was set to 6 months, starting from the inception of the project. This meant that we had to use atypical project management and software development methodologies.
- There were to be no funding for the project. All tasks should be implemented by members of the public sector. This meant that any sort of procurement or process that induced costs for the public sector, was not allowed.
- No new ICT infrastructure was to be procured, inc. software and hardware. This meant that we had to use existing infrastructures (if any), and FLOSS.

## 4. Geodata.gov.gr

Geodata.gov.gr is based solely on FLOSS, open standards, and is hosted on virtual machines.

### 4.1 Catalogue

The catalogue is the main entrance point for citizens. The look and feel is loosely based on data.gov.uk and data.gov, which were used as best practice examples during the design and development. The catalogue is based on Joomla/MySQL, with some custom extensions to support the required functionality. The catalogue enables each user to search for data, find published data for each public body, and download data in open and proprietary formats (shapefiles, KML, GML). This was deemed necessary to promote uptake from experts (knowledgeable in GIS) and citizens alike (easy to publish on Google Maps).

Metadata are also provided, and are fully compatible with INSPIRE regulations. They are created using the online INSPIRE metadata editor. If metadata were already available, they were validated through the same service.

GeoNetwork is up and running behind the scenes, hosting all available data as an alternative delivery medium. Early feedback from selected users indicated that the user interface is extremely lacking in appeal and functionality for people not educated in GIS, so we developed the Joomla interface to accommodate non expert users.

### 4.2 Interactive Maps

The map section of the service is where most citizens actually *make sense* of the data. Providing interactive maps was necessary: (a) to aid the citizens in comprehending geodata and (b) to lay a path towards future services from the public sector (e.g. one-stop-shop for environmental permits).

All vector geodata are stored in PostGIS, while raster data are either kept on the file system, or integrated from other web services (WMS, Google Maps API, Microsoft Bing Maps API). We use UMN MapServer to create maps and offer them as WMS and/or WFS, depending on the complexity of the particular data set. Further, the MapFish framework was used to aid in developing the web client, which incorporates several JavaScript libraries (OpenLayers, geoExt, jQuery). The full architecture is RESTfull, offering increased performance and resilience.

### 4.3 Deployment

The actual site is deployed in eight (8) Ubuntu Virtual Machines, kindly provided by GRNET S.A. (a public company), with modest to low specifications (2GB main memory, 45GB storage, 1 2.0 GHz core per VM):

- All VMs have the same software stack and their roles can be altered in a few minutes to support changing needs. A typical distribution is 2 for the catalogue, and 6 for the map server
- The VMs hosting the catalogue (Joomla/MySQL) are on an active-active configuration and are independent from the map servers.
- The VMs hosting the maps servers are independent and can individually shut down without any effect on functionality. All servers share a common tile cache, while tiles are created on a per layer basis with several strategies. The web client concurrently requests tiles/data from all available map servers, at any time, to increase throughput. Spatial queries can be performed from all servers, independently.

## 4.4 Utilization

Since 14/8/2010, where the beta version of geodata.gov.gr went live, we have served more than 200.000 unique visitors from 80 countries, and 3,5TB of geodata. In this time, the total downtime was 3 hours. Further, direct costs savings (through data reuse) are estimated to be 15M €, while indirect benefits (e.g. better governance, financial growth, third party services), have not been calculated.

## 5. Lessons learned

Hoping that some of our experience can be transferred to other countries, individuals and NGO's promoting open data, this is our advice for any similar efforts.

**i. Explain Licensing.** Trying to study the various licensing options of open data is in itself a daunting task. Throwing into the mix uneducated civil servants, hidden agendas, existing legislation, and attempting to establish a common framework, is almost impossible. Be prepared to answer naïve questions and provide convincing answers. Nothing can be taken for granted, or as a given. Educate on every occasion about what a license is, why we need licenses, how licenses work and are enforced.

**ii. Citizens forget.** For the citizens, the public administration is a single-cell living organism. It has no age, no color, no political agenda. This may be true, in the sense that an efficient public administration *should* be diachronic and politically agnostic. The same argument however, has the power to demolish any acts of openness. Citizens demand open data, but are frustrated when examining their quality. So the benefits of a democratic act (opening up data), are vanished almost immediately. Citizens forget in an instance (a) that the data were previously unreachable, (b) the lack of data quality was a closely guarded secret, (c) the gains in transparency, participation, and economic development.

**iii. Civil servants don't forget.** Being open is not a switch; binary approaches do not work. So a top-down approach is needed (the essence of Gov 2.0 vs. eGov). The current mix of activism, political support, economic crisis, and citizen disbelief, while it lasts, is a unique opportunity for change. Governments must work asynchronously from civil servants. They must enforce transparency through selected, high visibility, and low cost measures. Build momentum, gain support, and legislate accordingly. The next step is to democratize and impose openness on a larger scale.

