

gvSIG: Open Source Solutions in spatial technologies

gvSIG is a tool for handling geographical information, a completely GIS client with license GNU GPL.

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Conselleria de Infraestructuras y Transporte of the Generalitat Valenciana is moving into a migration process towards open systems under Linux. In the SIG / CAD area they developed gvSIG, a Free Software Project under GPL licence. IVER TI S.A. is the software development company and the Jaume I University is the supervisor in international OGC software standard assurance. gvSIG emerges as a SIG client with the target of fulfilling the Generalitat Valenciana user in a multiplatform mode. Therefore the choice of Java development language. During this process it comes into the geographic information world the Spatial data infrastructures providing a basis for spatial data discovery, evaluation, and application and as a new working paradigm. gvSIG project has as one of its features the evolution according with this new paradigm, where every time new technology is added up, with a must in Interoperability, in following emerging and existing international standards, in developing quality software and technologically independent systems. Thus, the gvSIG Project, means accomplishing the development of a Free Software spatial data infrastructures.

KEYWORDS

Open GIS, spatial data infrastructures, public participation GIS, GIS, ISPIRE, Globalization, Spatial data integration & interoperability, World balance and co-operation, Open Source.

GVSIG: OPEN SOURCE SOLUTIONS IN SPATIAL TECHNOLOGIES

In nowadays world changes are continuous and they occur as fast as sharing information speed. Those changes have a clear influence in technological evolution, in business models and in administration management politics. Cartography and Spatial Information Systems is nowadays in the middle of as change. In this context appears gvSIG.

At the end of 2002, the "Conselleria de Infraestructuras y Transporte" of the "Generalitat Valenciana" (Regional Government of the Comunidad Valenciana) starts a global migration process towards open systems under Linux. Within this process it gets special relevancy the GIS and CAD software migration, due to the final users working within the "Conselleria" and to the fact that GIS and CAD are nearly unknown areas in the Free Software World.

An study about the Free Software World comparing the Geographical Information Systems projects with the most commercially extended proprietary software and considering the requirements of the "Conselleria de Infraestructuras y Transporte" was made. To analyse the problem globally, we designed a survey which gathered all the information regarding current and future users requirements working with Geographical Information. The survey collected a great deal of data such as tasks and performances of software and hardware of the surveyed users, considerations on graphical and non graphical data, GIS / CAD tools used, formats and cartographical data types, common operations, actualization frequency and implementation software...

With all this information, of both requirements study and the available software within the Free Software Community, we concluded that their was not a well enough developed GIS /CAD software project which could lead to change from Proprietary to Free Software. We challenged a development

project aimed to cover the current deficiencies and which could make reality the change into Free Software.

The “Conselleria de Infraestructuras y Transporte” issued a public bidding on GIS development, such a project should fulfil users requirements and have the following features;

- Portable: being multiplatform hardware / software, Linux and Windows to start with.
- Modular: extendable with new functionality.
- Open Source: being a Free Software project with available source code.
- License Free: and Installation Free without any limitation in installation numbers.
- Interoperable when developed, can access data from proprietary programs without changing format.
- Accomplishing Standards: following the Open Geospatial Consortium (OGC) and UE directives.

The chosen programming language, after evaluating C and Java pilots, was Java, fulfilling therefore the multiplatform requirement.

The gvSIG project participants are:

- Generalitat Valenciana through the Conselleria de Infraestructuras y Transporte as the project driver.
- IVER TI S.A. , company winner of the public bidding and being the development driver.
- Universidad Jaume I, member of the TeIDE consortium, as coordinator and supervisor of the development following the international standards (Open Geospatial Consortium)

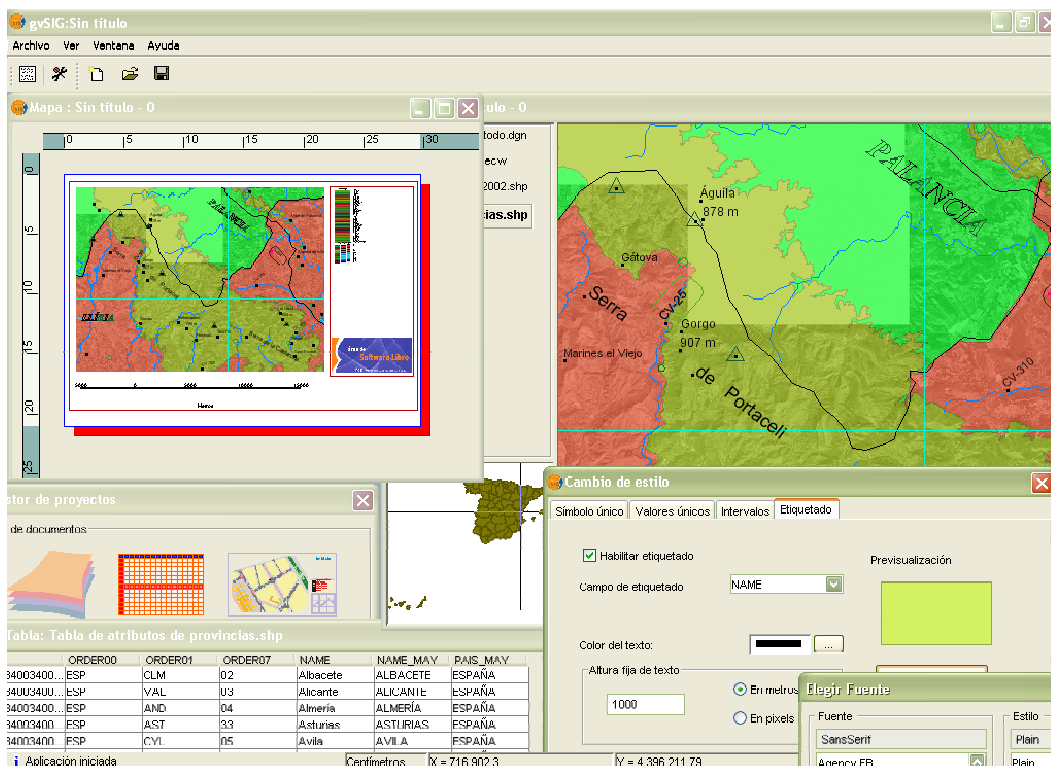


Figure 1: The gvSIG window.

During the gvSIG development we faced an item which modifies the planning of the project : the "Conselleria de Infraestructuras y Transporte" receives the task of elaborating an study of the new model emerging when working with Geophysical Information, Spatial Data Infrastructures (SDI). The study of the INSPIRE European initiative and the public spatial data infrastructures turns gvSIG (a GIS client) into an SDI client. Therefore, the gvSIG projects becomes a study and set up of the Free Software SDI implementation.

gvSIG turns into a completely GIS client (incorporates WMS, WFS-T and WCS), adding up a catalogue (WCAT) and integrating in the same view, data from different origins together with local data.

We developed an spatial metadata generation protocol according to the International ISO 1915 standards in those aspects lacking from concreteness, joining the working team which defines the NEM (Núcleo Español de Metadatos) for the Spanish Spatial Infrastructure Data (IDEE) and using a tool of Free Software (CATMDEdit).

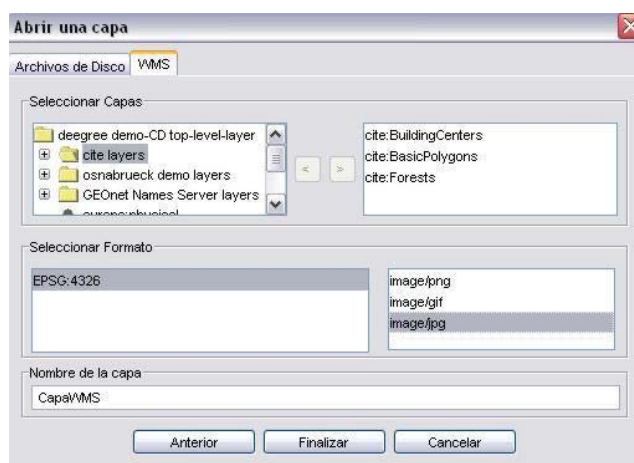


Figure 2: standard OGC services (WMS, WFS, WCS).

Regarding the Map Servers, we are making several tests with Mapserver, Geoserver and Degree, betting for PostGis as the database manager, Spatial module from PostgreSQL.

This is the working line droved by the "Conselleria de Infraestructuras y Transporte" with the aim of putting into work different Free Software Technologies which could give an answer to the challenge of setting up Spatial Data Infrastructures.

At the same time, gvSIG serves as the foundation of a new Free Software area at IVER, with this we try to present in any Geographical Information issue, and alternative and a solution based in a Free Software development.

Fronting the current close market, we open a branch of possibilities thanks to the advantages of the Free Software, namely:

- Impendency and control of the product
- Investment in added value generation. The whole investment is dedicated to develop and not in licences.
- Maximization of client rights.

With this new model we try to reach the potential market of new GIS users, which currently can not

afford the use of those technologies. Therefore, administrations and companies with limited financial capacity can access the software.

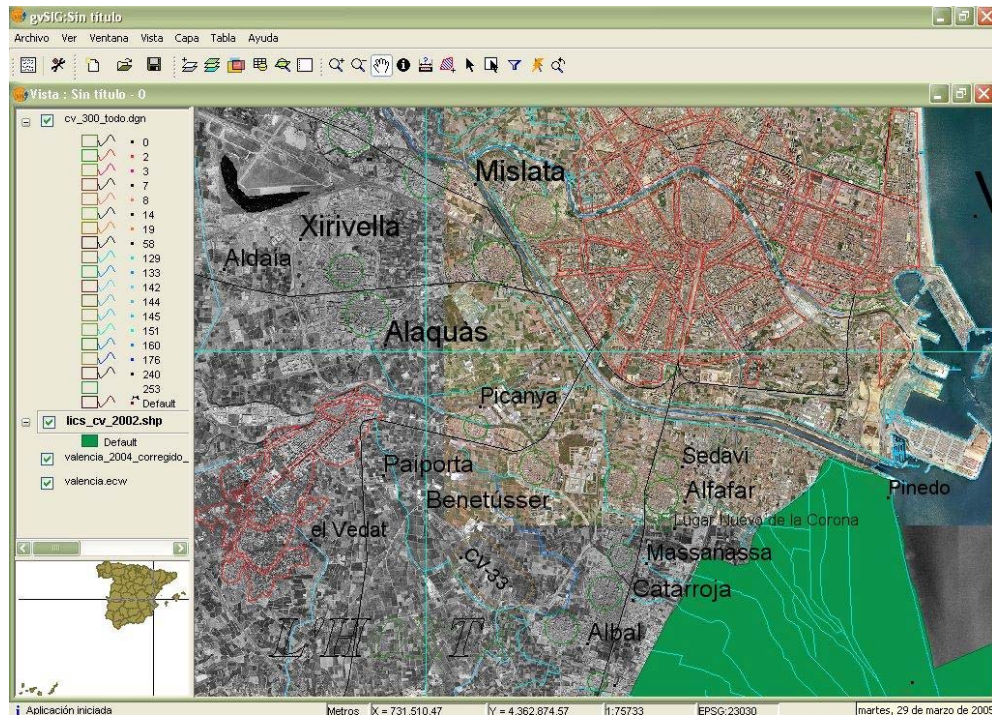


Figure 3: Exploring data on a map

At this point we consider the benefits which could give the Free Software at software business companies. As every new business model, the benefits may not be following the traditional way. So, gvSIG is the centre of all IVER service offers: consultancy, software implementations, I+D projects, courses, technical support

Very society statements front itself with new concepts of reality vision, those have direct or indirect influence in their life. Thus, the cartography world is not excepted. Information transmission speed, globalization, standardization, new European concept, investment optimization, the interoperability between public administrations, are elements to consider when analyzing the changes in progress or still to come within the spatial management technologies.

We confronted a new reality where every time more technology is added up, those technologies must understand each other, thus standards are necessary.

This new scenario, makes betting for Free Software development projects, with technological independency and added new values such as sharing of knowledge, investment optimization, industrial quality far from the software development monopoly.

The current situation of commercial software distribution companies is such that the local branches are suffering as well this close dependency to the main office.

The last years, a new vision comes into the picture and causes some enterprise movements, those movements are basically the creation of new scenarios where sharing ideas and adding up efforts are considered a sign of progress. As a result we end up with a group of developers, well prepared and willing to collaborate in Free Software projects and with a software companies network which offer different services, all together building up those new scenarios.

The benefits are clear, not only for the client, but for the companies as well, the reason is dual, first

of all the access to a more fare market which does not have the hard conditions of the software proprietary companies, second of all the we expect a growing new market because investment are from the first euro dedicated to develop and not to speculate.

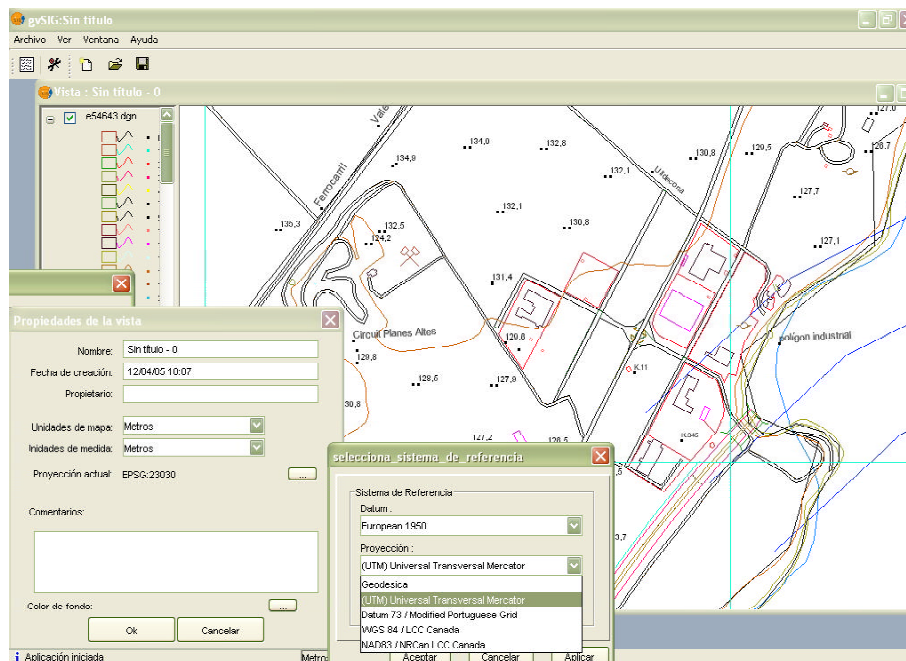


Figure 4: Choosing a projection

This lead us to talk about GPL licence.

A GPL License let us a binary distribution of source, and therefore a access to source code. Making modifications is openly allowed, but only integration is possible if we play with two similar or compatible licences, when public code is released under GPL licence, it is no longer possible to change those GPL conditions. Thus it will never be possible to change a GPL program into a proprietary one. This licence maximize the client rights and they see that as a guarantee.

GPL license allows to propose alternatives to the current business models, and is the essential feature of gvSIG.

It is difficult to accurately know the market movements, the technology ad society direction in the next years, but it seems logical to think that we are facing a market diversification.

Visit <http://www.gvsig.gva.es>

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