

Making public administration's software public: The Andalusian Software repository

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Making public administration's software public: The Andalusian Software repository

Introduction

In 2005, the regional government of Andalusia decided to make the software it owns available as FLOSS by means of a repository. Since 2003 already, the government of Andalusia is pursuing a comprehensive strategy to help its citizens enter the information society. Free/Libre/Open Source Software (FLOSS) is an important tool within this strategy.

FLOSS in Andalusia

Andalusia is an autonomous community of Spain. Located on the southern part of the Iberian peninsula, it is Spain's most populous region, with nearly 7 800 000 inhabitants (17.8% of total population), and its second-largest by area.

IT-experts in the Junta de Andalucía¹, the regional government, have known and used FLOSS for many years in the server environment (mail, files, web, and proxy servers) as well as security tasks such as firewalls. They were very satisfied with its performance. FLOSS had therefore been present in the Junta for quite some time; but it only became more widely used when decision on the use of FLOSS were made at the political level and supplemented with a legal base.

On the basis of the sweeping and ambitious Decree 72/2003², passed in 2003, the province has created its own GNU/Linux distribution, Guadalinux³. This adapted version of Extremadura⁴'s gnuLinEx⁵ is now in widespread use in schools, libraries and public Internet centres.

For the repository, the idea is to reduce inefficiencies of a federally organised administration through sharing software and solutions. In the Junta, each ministry has its own informatics service. This lead to a lot of duplication of effort in the past, especially where software procurement was concerned, with different ministries developing similar things in parallel.

Legal foundations

The "Order about public availability of the software of the Junta de Andalusia and its autonomous agencies"⁶ was adopted on Feb. 21, 2005. Based on the more wide-ranging decree from 2003, the order aims to make the software to which the regional government holds all rights available as widely as possible, for the benefit of the public.

It lays the groundwork for a repository in which the Junta publishes the software it owns:

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- 1 Junta de Andalusia: see <http://www.juntadeandalucia.es/>
 - 2 Decree 72/2003: see <http://www.andaluciajunta.es/RBOJA?p=6024&a=2003>
 - 3 Guadalinux: see <http://www.guadalinux.org/>
 - 4 Extremadura: see <http://ec.europa.eu/idabc/en/document/1637/470>
 - 5 gnuLinEx: see <http://www.linex.org/>
 - 6 see <http://www.juntadeandalucia.es/repositorio/softwaremap/orden21Feb.pdf>

IDABC Open Source Observatory and Repository (OSOR)

- All software in the repository will have “the character of free software” (Art. 1)
- “Free software” is defined along the lines of the Free Software Foundation's four basic freedoms⁷. (Art. 2)
- Source code and documentation are to be published along with the software binaries. (Art 3)
- The administration may refuse to publish a piece of software for “justified reasons”. (Art. 5)

As a rationale, the decree states that FLOSS enriches knowledge, can be improved and built upon by anyone, and makes cooperation with other public administrations easier.

Political Objectives

The Junta sees various benefits in the repository, resulting in a strong impulse for regional technology development:

- higher efficiency within the Junta itself – less duplication of effort
- local enterprises that develop software for the Junta can build upon existing work
- a software market that is more open and competitive
- a competitive edge for local firms in supporting the software
- greater opportunities for local firms.

The Junta also considers⁸ that the project makes processes more transparent and increases security while optimising efficiency.

By providing a point of exchange, the repository is supposed to stimulate a flow of software between different administrative bodies: Some may produce software, others may adapt it and improve upon it and feed it back into the repository. Legally, the project executes the 2003 decree⁹ by promoting the spread and use of FLOSS.

The repository



Content

The repository of the Andalusia Regional Government currently (as of Feb. 19, 2007) contains 62 applications that are accessible to everybody. 175 programs are provided only to other public administrations, while 11 are reserved for use within the government of Andalusia itself.

⁷ FSF: see <http://www.gnu.org/philosophy/free-sw.html>

⁸ see <http://www.andaluciapress.com/vernoticia.php?cod=39470>

⁹ 2003 decree: see <http://www.andaluciajunta.es/RBOJA?p=6024&a=2003>

With an overhaul of the repository scheduled in the near future, the number of applications is likely to drop; but at the same time, the quality of documentation and source code should increase.

Software in the repository is ordered according to the IDABC software taxonomy¹⁰. Initiatives like Adullact¹¹ and SourceForge¹² provided inspiration. Each ministry now has a person who is responsible for uploading projects into the repository, assigning categories, and uploading documentation and source code. Before an application is made available on the repository, its quality is checked. There is also a check to confirm that the Junta really holds all rights to the software.

Technical aspects of the repository

Hard- and software

The repository is set up using fairly standard software applications, all of them available under free licences (see Table 1).

The hardware consists of two servers, both with an Intel Xeon 2.8 Ghz processor and 1Gb of RAM.

<i>Function</i>	<i>Software used</i>
Operating system	GNU/Linux: Ubuntu 5.10 “Breezy Badger”
Repository software	GForge
Web server	Apache
Scripting language	PHP4
Mail server	Postfix
FTP server	ProFTPD
Database server	PostgreSQL
Authentication	OpenLDAP
Version management	CVS, Subversion

Table 1: Software used for the repository

Functionalities that have been added make it possible to geographically map visits¹³, and to display news (such as press releases about the repository). There is also an interoperability mechanism¹⁴, which allows exporting information such as metadata to other repositories according to the specifications of the Spanish Ministry of Public Administration. The basic RSS syndication service available in GForge was modified to provide separate RSS feeds for each category, so that users can choose according to their interests.

Though the ministry of Innovation, Science and Enterprise issues recommendations with regard to matters such as the programming languages used, these are not binding, and are not necessarily adhered to.

¹⁰ IDABC software taxonomy: see <http://ec.europa.eu/idabc/fr/document/3499/5737>

¹¹ Adullact: see <http://adullact.org/>

¹² SourceForge: see <http://sourceforge.net/>

¹³ see <http://www.juntadeandalucia.es/repositorio/map/index.php>

¹⁴ see <http://www.juntadeandalucia.es/repositorio/export/interoperabilidad.php>

Internal and external access

The repository is divided into an internal and an external part. The external repository is the part that is accessible to the public. It acts mainly as web interface for the storage area. A PostgreSQL database provides information about software in the repository, which is stored at file-system level on a machine running GNU/Linux. The internal repository is only accessible from the Junta's intranet.

Inside the Junta's intranet, a private server uses rsync to put a copy of the database and the directories onto the public server. Other Andalusian public administrations which are part of the Junta can add their software to the repository via the Junta's intranet. Users from the Internet access the public server via http.

The external part of the repository is publicly accessible. Some applications can be downloaded right away; for others, an informal request to the Junta is required. According to the repository's website, this is necessary to identify the user and have her accept the conditions¹⁵ under which the software is provided.

The internal part utilises the full capabilities of GForge¹⁶. Those responsible within each ministry can upload software, using an interface similar to that of the "visible face" of SourceForge¹⁷. In the internal part, there is also more information about the projects, such as which ministry has uploaded what number of applications in the repository.

The repository is not designed as a platform for collaboration between developers, but rather meant to promote the reuse of existing software. The internal repository does not try to build a developer community, except for horizontal projects within the administration. For the external repository, however, there is a growing need to provide a space for developer communities. One perspective is to develop e.g. educational software together with other Spanish regions.

Only persons belonging to the government of Andalusia may have authenticated access to the repository. Authentication works via the Junta's corporate LDAP system. The system assigns roles to users, depending on which they may contribute to existing projects or create new ones.

Until now, the repository does not accept contributions from outside the Junta. Local administrations have been wanting to contribute, but the repository was not yet set up sufficiently to deal with their inquiries. Enabling this remains a task for the future.

First of all, find out what's there

The first task was to analyse the software the Junta already had. As the technical set-up of the repository was not particularly complicated, it was compiling this catalogue that took the most time.

Usage

The geographical distribution of visits to the repository can be tracked live¹⁸ on the World Wide Web. Table 2 lists the applications which are downloaded most frequently.

15 see http://www.juntadeandalucia.es/repositorio/softwaremap/trove_mas.php

16 Gforge: see <http://gforge.org/>

17 SourceForge: see <http://sourceforge.net/>

18 see <http://www.juntadeandalucia.es/repositorio/map/index.php>

<i>Application</i>	<i>function</i>	<i>Number of downloads (by Feb. 18, 2007)</i>	<i>uploading ministry</i>
AMATEL	Analysis of satellite images	589	Consejería de Medio Ambiente (Environment)
PLANES ESPECIALES	Staff management	499	Consejería de Justicia y Administraciones Públicas (Justice and public administrations)
APLOPD	Secure management of citizen data	422	Consejería de Justicia y Administraciones Públicas (Justice and public administrations)
Agenda Web	Web-based activities planner	414	Instituto Andaluz de la Juventud (Youth)
Port@firmas	Electronic signatures	180	Consejería de Medio Ambiente (Environment)
Visual Behave Fuego I	Prevention of forest fires	172	Consejería de Medio Ambiente (Environment)
siroco	Document management	161	Consejería de Innovación, Ciencia y Empresa

Table 2: Applications downloaded most frequently from the repository

Though the site statistics are currently not very reliable, the following numbers indicate the scale of usage that the repository is seeing:

- From Sept. 1 2006 until Feb. 18 2007, the repository site received more than 17 600 visits.
- Apart from a drop during the Christmas season, there were between 150 and 200 visits each day, with more than 80% from individual visitors.
- Though by far the most visits originate from Spain, a significant share comes from Spanish-speaking countries of Latin America, namely Mexico, Venezuela, Colombia, Ecuador, Peru, Bolivia, Argentina and Chile.

Three of the applications in the repository currently have an active developer community. These are AMATEL (for analysing satellite images), which is also currently the most downloaded application; Enebro, a cartography application for hand-held computers; and Seneca, which is used for managing educational institutions.

Costs and benefits

Setting up and running the repository is an additional task for the IT service of the ministry of innovation, science and enterprise. One person was hired to act as a contact point for user's requests, and to perform maintenance work.

Requests for downloads of those programs in the repository which are not made available to all are currently attended to by those ministries which contributed the program in question. Though this requires some human resources, it does not present much additional work.

A small contract of EUR 30.000 was awarded for the technical work of building the infrastructure, which consisted mainly of adapting a GForge installation to the administration's needs. At the contracting company, a maximum of three to four people worked on the project. If there had been

However, the repository receives a considerable number of visitors from Latin America, where an explicitly European licence might lead to problems, both legal and practical.

Putting a licence on the software in the repository requires additional work, namely inserting licence headers into the source files. As most of the software already existed when the repository was set up, the licence headers have yet to be added in most cases. This means that technically, most of the software in the repository is currently not under a FLOSS licence. The inclusion of the license headers will be part of the next milestone for the repository, in May 2007.

It should be noted that some software in the repository may require the use of proprietary libraries or platforms²⁰. As an example: An application such as AMATEL²¹ may be FLOSS, yet it only works on a (proprietary) Microsoft Windows operating system.

Outlook

Though the repository has been up and running in its basic form for some time, there are numerous issues to be addressed.

Remaining tasks are to complete the metadata about the software in the repository, and to gather and compile documentation and source code for the software. The process for managing formal requests for software also needs to be optimised, and the technical infrastructure needs to be improved. Quality control needs to be strengthened, and the upload process should be streamlined. The administrators plan to add a forge server for development behind the repository's private server.

In the longer term, there are considerations to make it easier for users of the Andalusian repository to access software in other repositories. Another idea is to enable contributions from outside the Junta. The aim is to make the repository a source of reusable components. But the first priority is to get all the Junta's software uploaded, a task which is far from finished at this time.

Those working on the repository are very much in favour of a European repository for public sector software. They argue that having a repository similar to the Andalusian one at the European level would make a lot of sense. The Junta's repository is capable of exporting metadata in XML, and could be linked with a European repository.

Evaluation

Cultural resistance

The technology behind the repository is rather simple, and there were no legal obstacles. The main challenges turned out to be cultural ones. The idea of publishing the Junta's software under a free licence did not meet with opposition so much as with fears and concerns, especially within the Junta itself.

Before the repository was started, the Junta consulted the local enterprises about it, many of which had developed the software in question. Their reaction to the proposal of a repository was positive, including seeing their work published as FLOSS.

There was a certain degree of resistance within the Junta that had to be overcome in setting up the repository. This was mostly because some of the ministries were hesitant to see their software

²⁰ see http://www.juntadeandalucia.es/repositorio/softwaremap/trove_mas.php

²¹ AMATEL: see <http://www.juntadeandalucia.es/repositorio/projects/amatel/>

published, or even to share it with others. There were no objections to the goal of software reuse and cooperation, but that some in the Junta were not enthusiastic about making the software available to the public.

Lesson learnt: communication is key

One important lesson is that successful implementation of even a limited project such as the repository requires good communication to overcome cultural obstacles both inside and outside the administration. While outright opposition may be rare, fears and doubts need to be addressed.

In communicating the project, initially the emphasis was put on liberating the software, rather than on collaboration. Now the repository is communicated as a place for cooperation between different parts of the Junta. In hindsight, it appears that a thoroughly considered communication strategy would have been helpful.

Now that the repository is up and running, people can see that it fosters the distribution of knowledge, and that it creates opportunities for businesses that were not able to work for the Junta before. The next challenge is to build an agile and efficient cooperation between the different parts of the Junta. This is technologically somewhat more difficult.

Andalusia's experience shows that culturally, it is quite a step for the public sector to open its software. People may be reluctant to publish their software's source code due to a lack of knowledge, or due to insecurity if it is really useful to others. A ministry might be worried that its software is simply not good enough, and that publishing it in binary or source form might hurt its reputation. There were also concerns that another ministry might publish a similar application of better quality.

Local businesses benefit

Though hard numbers are difficult to come by, all those interviewed consider Andalusia's use of FLOSS to be beneficial for businesses in the region. There are numerous activities around the repository. A network of firms is providing services related to the software in the repository. The money spent on these services by the administration remains in the region, rather than flowing out of the country.

It is now easier to break big projects down into small modules. This way, small, highly specialised firms, which would not be able to handle the whole project by themselves, can participate in the administration's tenders. Furthermore, firms can now acquire knowledge about applications they did not know about before. All the while, the Junta is saving money as the duplication of effort is greatly reduced.

Advantages for the Junta and beyond

It is the software inventory conducted for the repository that has had the most impact on the way software is used in the administration. The repository is fostering a culture of cooperation; but besides having the tool (i.e. the repository) itself, it is important to build awareness within the administration, both of the repository and of the advantages of sharing software. Having legal norms in the background helps, such as the decree of 2003, the order of 2005, and an upcoming decree on interoperability. This legal framework is a marked difference to the case of neighbouring province Extremadura²², where legal measures were put in place only after practical action had been taken.

The advantages appear real enough. The most obvious one is that the duplication of effort in software development has been reduced. Another point in the repository's favour is the pronounced interest from other public administrations, mostly in the Spanish-speaking world. This indicates that efficiency gains are not limited to the administration managing the repository; other public bodies, sometimes on other continents, may benefit as well, without significant added costs to the original administration.

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22 Extremadura: see <http://ec.europa.eu/idabc/en/document/1637/470>

23 Karsten Gerloff: see <http://www.merit.unu.edu/about/profile.php?id=707>

24 UNU-MERIT: see <http://www.merit.unu.edu/>

Links

- Decree 72/2003²⁵. Boletín Oficial de la Junta de Andalucía, no. 55, March 21 2003, p. 6024-6034.
- Protocolo General entre las Comunidades Autónomas de Extremadura y Andalucía sobre Colaboración en Materia de Uso y Difusión de Software Libre y de Linex en particular.²⁶ April 11, 2003.
- Order 29/ 2005²⁷. Boletín Oficial de la Junta de Andalucía, no. 49, March 10, 2005, p. 6 f.
- Website of the Repository of the Junta de Andalucía²⁸.
- Elia Branco, Marcelo: Free Software in Andalusia, a Brief Report²⁹. Sept. 2006.
- Andalucía Press: “El modelo de implantación del Software Libre del Gobierno andaluz despierta el interés de la UE”³⁰. Press release, Nov. 11, 2006.

This case study is brought to you by the Open Source Observatory and Repository³¹, a project of the European Commission's IDABC project³².

25 Decree 72/2003: see <http://www.andaluciajunta.es/RBOJA?p=6024&a=2003>

26 Protocolo General: see <http://www.juntadeandalucia.es/averroes/actualidad/andared/protocolo.php3>

27 Order 29/2005: see <http://www.juntadeandalucia.es/repositorio/softwaremap/orden21Feb.pdf>

28 Repository Junta de Andalucía: see <http://www.juntadeandalucia.es/repositorio>

29 see http://twiki.softwarelivre.org/pub/Blogs/BlogPostMarceloBranco20060912121042/Andalucia_informe_en.pdf

30 Modelo de implantación: see <http://www.andaluciapress.com/vernoticia.php?cod=39470>

31 <http://ec.europa.eu/idabc/en/chapter/452>

32 <http://ec.europa.eu/idabc/en/home>