

Vieira do Minho: Citizens and administrators profit from open source¹

For more than a decade, the administration of the Portuguese town of Vieira do Minho has made open source its first choice when adopting software. The benefits can be measured not just in terms of flexibility, but also through improved efficiency and lower costs.

The first open source project started 13 years ago when the administration of Vieira do Minho decided to implement a decentralized system for management and filling of requirements. This first experience opened the door to a completely new chapter in IT systems in the municipality, demonstrating the cost-effectiveness, flexibility and independence from IT vendors that open source solutions provide.

Located in the north region of Portugal, in the Braga region of northern Portugal, Vieira do Minho has nearly 13,000 inhabitants. It is one of the country's oldest municipalities, with an independent history dating back more than 500 years, but the current leaders of the administrative division have shown that they are not stuck in the past. They are using new technologies and open source software to improve their own efficiency and the services they provide to citizens.

The first project started in 2000 with the support of the nearby University of Minho, which developed an administrative system for management and filling of requirements, with terminals installed in local villages. The objectives were to decentralize management procedures, cut the amount of time citizens needed to use public services, improve the speed of information access, and boost the productivity of employees in the services concerned.

The decision to implement open source was supported for budgetary reasons but also as a strategic political resolution – an idea that was reinforced when Jorge Dantas came to Vieira do Minho as the town's new President. "At this time we have put all our emphasis on open source. The strategic directives where to provide to all citizens who interact with our services the best possible experience, in the shortest time, guiding the municipality through the values of cost saving, reliability, safety and simplicity," says Marco Candeias, advisor to the President of Vieira do Minho.

Now, from the top to the bottom of the Vieira do Minho administration, everyone recognizes that there is no turning back. "We won't change our decision and we will continue to use open source wherever possible. Open source software is so integrated within our services that I believe its use is going to expand. Whenever we find a solution that can replace a proprietary application we will implement it," says António Rebelo, head of IT in Vieira do Minho.

¹ <https://joinup.ec.europa.eu/page/legal-notice>

In the years since 2000 this strategy has been developed with success, from database management systems to include applications ranging from databases and geographic information systems to Web, email, file and print services on servers running Debian. Open source is also used on desktop computers in schools and local services, with LibreOffice personal productivity suite, and in voice communications.

“The main lesson we can take from 13 years of open source software is that institutions can save thousands of Euros as well as gaining freedom through users’ power to personalize their experience. We are not prisoners of the IT vendors and we can grow our solutions at our own pace to suit our needs,” explains António Rebelo.

Although there is no formal report on the savings achieved, Marco Candeias says that over time, budget planning has proved that open source has always been the best solution for Vieira do Minho. “I can say without reservation that we save money every time we implement open source software. The best examples are software licensing and communications,” he says.

Considering the European economic situation, especially in the southern countries, António Rebelo notes that in the near future public institutions will have lower budgets to invest in proprietary software and costly licenses. “They will take measures so that open source can replace this proprietary software,” he predicts.

“We at Vieira do Minho are already part of the way along the path to achieving total independence from vendors. And whenever possible we will continue along this route,” Rebelo adds.

Although obviously satisfied with the choice made, the IT department head recognizes that there are some difficulties, especially because it is not easy to find open source solutions for all the municipality’s needs. “It is necessary to put some time into research and get testing to make sure that the applications cover all the institution’s requirements, and especially the needs of the users. But whenever we find the right application, it is extremely gratifying to see that open source software is also available in very specific areas,” says Rebelo.

Key points on Vieira do Minho’s use of open source

- **Implementation date**
 - The project started in 2000
- **Key benefits**
 - Cost reduction made in each software implementation, and in voice communications

- Flexibility to adapt software to specific needs of the services
- Personalization of end-user experience
- Independence from IT vendors
- Improvement of services provided to citizens

- **Areas involved**

- Day-to-day processes in Operations
- Community services and social action
- Finance
- Engineering and Building Services
- Licensing
- Clerk's Office and Archive
- Education

- **Software used**

- iPortalDoc – document management system
- Polyspeak – VoIP package based on Asterisk
- LibreOffice – productivity software
- Thunderbird – email client
- Mozilla Sunbird – calendar
- Mozilla Firefox – Internet browser
- Google Chrome – Internet browser
- Quantum GIS – geographic information system
- Grass – geographic information system
- PostGIS – geographic information system
- GIMP – image editor
- Postgres and MySQL – database management systems
- Dia – diagram design
- NetBeans – Java development environment
- Audacity – sound editing
- PDF Split and Merge – PDF editor
- PSPP – statistical analysis
- R – statistical analysis

- **Technical environment**

- 12 servers, of which 10 are based on open source
- 70 personal computers and workstations
- 25 virtualized desktops (NComputing) used by more than 500 students

Step-by-step implementation

Vieira do Minho began its use of open source on servers in the IT department, and has gradually extended open source to other areas and end-user equipment.

Linux was used in the first servers set up by the IT department of the University of Minho. Victor Francisco Fonte, professor and member of the university's High-Assurance Software Lab (INESC TEC), also recalls the implementation of RAID storage and a file sharing service. "Quickly the project started to incorporate other areas, like the development of software for managing internal users, acceleration of Internet access and control, and the beginning of a web service for Vieira do Minho's intranet," he says.

The initial project was based on three servers and about 20 workstations, with 30 users. But these numbers later grew exponentially.

"At the point when decision-makers and users gained confidence in the functioning of the infrastructure and verified the cost reductions, it became clearer that advantages could also be obtained with operating systems and applications at the workstation level," remembers Victor Fonte.

Progress was similar to that of other projects in which the university participated. The professor recollects that since the mid 1990s the Minho's university's IT department has been involved in several awareness activities to promote open source, as well as "real life" projects. Seminars, conferences, LAN parties, academic sessions with the Instituto de Gestão e Administração Pública (IGAP) – the main training organization for the public services in Portugal – and research groups are just some examples of the many open source activities concentrated on the University of Minho. As well as Vieira do Minho, several other municipalities have adopted open source solutions as a result.

One of the biggest open source successes in Vieira do Minho is the document management solution lportaldoc from lportalMais, a Portuguese company based in Porto, around 90 km from Vieira do Minho. Fully configured to suit Vieira do Minho's needs, lportaldoc is used in day-to-day processes in the municipality's Operations, Community and Social Services, Finance, Engineering and Building Services, Licensing, Clerk's Office and Archive departments.

Another important reference resides on the personal computers of end users. When the IT department decided to change the municipality's productivity software, OpenOffice.org – now LibreOffice – was chosen as the best package.

Open source solutions are now used in every service of the municipality. The adoption extends to EPMAR, the company responsible for water and waste treatment, the police service, tourism, the library, and schools.

"The school students use 25 NComputing terminals connected to an open source server running an Ubuntu distribution," says António Rebelo.

Though this system was put in place during the current school year, the two schools' contact with open source solutions dates back to 2006–2009, when

first-grade students took computer classes using open source solutions. These even included chess tournaments built around a chess program from the openSUSE distribution. Teachers from the ICT department organized these tournaments as an extracurricular activity, and the enthusiasm of students was high, particularly of those who took some medals home.

Geographic information just a click away

In 2012 Vieira do Minho implemented a geographic information system based on open source software. This is used for strategic planning and decision-making, and also to provide information directly to citizens.

The administrators recognized that geographic information is assuming greater importance in day-to-day operations, and that for local people this data is especially significant. They therefore decided to create a platform that would allow everyone to consult the Territorial Planning Instruments and databases.

Previous positive experience with open source software and the growing base of GIS open platforms contributed to the choice of PostgreSQL/PostGIS database and Quantum GIS, GRASS and gvSIG for the desktops, that replaced proprietary software.

The master plan for the municipality and nearby locations – the development plan for Albufeira da Caniçada, with its river barrage, and the urbanization plan for the settlement of Cerdeirinhas – are now available through the website <http://sig.cm-vminho.pt>. Users can locate cartographic data, search for localities, and view aerial photographs (orthophotomaps) and military maps. They can also measure areas and distances, and print geographic data.

The new GIS tools allow users to build their own maps from layers including place names, road networks, buildings and even aerial images captured from Google Earth. This way users can combine all the information.

The information is available through any Web browser – such as Firefox, Chrome, Internet Explorer or Safari – on any computer and operating system, including Mac OS X, Linux, Windows, iOS and Android, widening the choice for citizens and meeting the requirements for open formats.

Vieira do Minho is also planning to use the website to show tourist routes in main cities and villages, as well as statistics and other municipal data.

LibreOffice on all personal computers

The adoption of LibreOffice was also a turning point in the expansion of open source to all end-users of Vieira do Minho's services. Although several people already used open source productivity software, starting with OpenOffice, it

was not until 2012 that the adoption was considered complete.

“We took some time to install open source on every computer because in some cases the necessary solutions didn’t exist or did not offer the stability needed for intensive use. Particularly at the Office level, that is the most used software,” says António Rebelo.

LibreOffice was installed on every computer managed by Vieira do Minho’s IT department. The user experience was smooth, leading to very positive acceptance of the transition. “The adaptation process was very calm, and the few glitches caused by some changes in functionality were quickly dealt with,” Rebelo says.

The similarity of of the LibreOffice interface with that of software previously used in several departments helped the changeover processes. There was no need for specific training, as had been required for the GIS implementation. Rebelo says that end-users experienced few problems, and that most difficulties were resolved with a brief explanation.

Cost saving in voice communications

For voice communications Vieira do Minho uses Polyspeak, a locally created open source solution based on Asterisk PSK that was developed at the Engineering School at the University of Porto.

The platform allows the unification and optimization of all the municipality’s voice communications. It adds value to traditional solutions, explains project leader Tito Vieira, who is also director of [CICA](#) (Centro de Informática Professor Correia de Araújo), the university’s computer centre.

CICA developed Polyspeak to serve its own needs after finding that a commercial VoIP system would be too expensive, but the project soon evolved into something bigger. Three years later Polyspeak was being used for fixed and mobile telephony not just within the university but also in [more than 30 companies and public bodies](#), with more than 30,000 users. Besides Vieira do Minho, public administrations using Polyspeak include Alto Tâmega, Vale do Sousa and Vale do Ave, São João da Pesqueira, Angra do Heroísmo and Entroncamento.

In Vieira do Minho the impetus for adopting Polyspeak came from a project known as [VARD2015](#), which promotes digital projects in the communities along the valley of the river Ave, including Vieira do Minho.

Tito Vieira says that most of the administrations were attracted to VoIP because of its cost savings, which can be greater than 70% as studies conducted on the implementations point out when compared to conventional telephony solutions – though the savings depend on the profile of each organization. But VoIP also brings advantages in terms of new

communications resources and the integrated management of communications, including cost control.

Vieira do Minho experienced savings of both kinds. “Polyspeak replaces the traditional components of a communications system: the telephone exchange (PBX), ISDN lines, analog lines, and analog and digital telephones,” explains António Rebelo. “This allowed us to eliminate eight ISDN lines and we now save €240, plus VAT, per month just in line rental. And the cost of telephonic calls has dropped sharply, without compromising call quality.”

The system is implemented in the administration’s main building in Vieira do Minho, in the two school complexes, and at the Adelino Ângelo art museum. The plan is to expand the use of Polyspeak to the municipal library as soon as possible, and to consolidate the system in the schools, which are currently being modernized.

The advantages of VoIP extend to external communications, especially with public services in other parts of Portugal. “Polyspeak in Vieira do Minho is interconnected with Polyspeak systems in other public institutions, allowing us to communicate between different services at zero cost,” explains António Rebelo.

Beyond cost reduction: flexibility, open formats and reliability

Many of the benefits identified by the Vieira do Minho administrators since they started to use open source software have already been pointed by António Rebelo and Marco Candeias. In many cases cost reduction has been the main factor in the decision process, overshadowing other advantages such as gains in productivity and even independence from IT vendors. Both Rebelo and Candeias are confident that the strategy chosen by Vieira do Minho has a lot to give.

“Besides the financial benefits, we have the advantages of offering public services in open and free formats, eliminating the obligation to buy proprietary software or the temptation to make illegal copies,” says Candeias.

António Rebelo says that handling of citizens’ affairs has improved significantly, the effects being most evident in the internal operations of the municipal services. “Services have become much more efficient and we are able to respond more quickly to citizens’ enquiries,” he explains.

There are also benefits to the local economy. The adoption of open source software invariably increases the skills and capacities of everyone involved in the project, helping to add local value and knowledge, says Victor Fonte of INESC TEC. In contrast, he says, “in most cases proprietary software is developed by American companies. The licensing costs are almost entirely

sent out of the country, instead of being reinvested locally.”

And from the point of view of end-users, what is the result after 13 years of open source in Vieira do Minho? “It is truly positive. The users want something that works, and proves its benefits in daily life. The adoption of these technologies achieves those aims, so we are very satisfied,” notes Marco Candeias.

Training was almost unnecessary in most cases, even when it came to the main tools such as productivity software. “The users reported few problems. They were always supported and helped in their hesitations,” says António Rebelo. He adds that many of the workers found open source software easier and more flexible to use than proprietary applications.

Collaborative environment in public administration

True to the spirit of open source communities, Vieira do Minho is always willing to share its experience with other municipalities, to contribute to the development of software code and to correct problems.

António Rebelo says that occasionally there are visits from other public services to see how open source is used in Vieira do Minho and how the systems are implemented, especially the document management solution, that was the first project.

The experience of Vieira do Minho has been used as a case study by several institutions in Portugal and also internationally, says Marco Candeias. Open source is gaining ground in both private companies and public administration in Portugal, and good examples are starting to be more widely recognized.

Market consultant IDC Portugal estimates that more than 20% of Portuguese institutions use open source software on their servers and in other IT areas, and the government is putting some pressure on public services to adopt open formats. Legislation has been developed to make sure that open source software is evaluated on the same level as proprietary solutions whenever there is a need to implement new solutions.

Budget limitations related to the difficult economic situation are seen as a good opportunity for greater use of open source. However, there is still some resistance from public-sector decision-makers, who remain skeptical about the advantages of open source, a problem that Marco Candeias recognizes.

With a large experience in both the public and private sectors, Victor Fonte of the University of Minho, believes that there is a positive evolution and confidence to adopt open source is growing among decision-makers as well as IT departments. “Open source solutions have conquered an important space that was previously occupied by proprietary technologies, and the initial doubts are now gone,” Fonte says.

Considering that open source and open formats are now a fundamental part of IT strategy in public institutions, both for direct cost reduction and as a negotiating tool in the cases where proprietary solutions can still be justified, Fonte believes that the conditions for wider adoption of open source are already present.

“Availability and experience at the academic level, plus dedicated, permanent professional support, have existed for several years now at national level,” he says.

But the professor acknowledges several problems, mainly related to the lack of experience in sharing information, even in the public sector: “I confess that it is hard to see similar problems and technological needs being targeted through independent projects by the majority of municipalities.”

Fonte believes that a lot of time and effort have been wasted, and several opportunities for developing cooperative projects in open source have been misused. “I ask if it wouldn’t be a better use of public money for these local authorities to create a consortium and run a shared project, with a common database of software code, where a patch or an improvement made by one of the partners could benefit all the others.”

He adds that there are several models for access and licensing of open source software that could greatly reduce costs and lead to continuous improvements in the quality of services, both within and outside public institutions.