Open Source Observatory Annual Report 2016

The Open Source Observatory brings you the most important findings, trends and technology shifts in open source and public administrations.

"The free and open source software model is a far better model for public administrations."

Eduardo Romero: IT specialist Ayuntamiento de Zaragoza

Observations

Finding, trends and practices, detected by the Open Source Observatory.

Technology shifts

What's current in public administration's open source technology.

Most shared, most reused

OSOR's most read articles and case studies.

TABLE OF CONTENTS

SHARE AND REUSE

This report depicts the main trends in open source deployments by Europe's public administrations. We've sorted, systematised and summarised the most salient points, to help raise awareness on the benefits of sharing and reusing ICT solutions.

This report is based on many sources. Two stand out.

First, we've used the many case studies and news items written and aggregated by the Open Source Observatory (OSOR) one of the communities on the Joinup eGovernment professionals' portal and an authoritative source on free and open source software in Europe's public sector.

Our second starting point is the "Report on Policies and Initiatives on Sharing and Re-use", published by the European Commission's ISA Programme in February 2013.

Combining these and other sources, we aim to provide an overview of the free and open source steps taken by Europe's leading public administrations. We hope it inspires others to follow in their footsteps.

OBSERVATIONS

Introduction

The first section, 'Observation', reports on nine countries, one region, and one European institution. Here is the list:

- Spain;
- Estonia;
- France;
- Malta;
- Netherlands;
- United Kingdom;
- Italy;
- Bulgaria;
- Poland;
- Basque Country; and
- European Commission.

Our observations begin as updates on the "Report on Policies and Initiatives on Sharing and Re-use". This report, published in 2013, singled out the first five countries (Spain … Netherlands) and the one region (Basque Country) listed above for their open source policies.

Only for these six, the texts is split between **Policy recap** and **Recent Developments**. The former summarises the relevant sections from the 2013 report, the latter is based on input from Member States and the news items and case studies published by the Open Source Observatory and other sections of the Joinup eGovernment portal.

We have added four countries (United Kingdom, Italy, Bulgaria and Poland) and the European Commission because these have since then published their open source policies.

Spain strengthens its support

Policy Recap

Sharing made law

The Spanish government has been pushing its public administrations to use free and open source software since 2007 – almost a decade.

The country's eGovernment Law (11/2007) promotes the "reutilisation of applications and technology transfer" through two articles. One (45) emphasises the rights of public administrations to share software that they develop, or that was developed for them. The other (46) requires public administrations to make such applications available to their peers.

In 2007, Spain also started its technology transfer centre (CTT). In due course, two of the CTT's core tasks would be to host a repository of reusable ICT solutions, and to promote the development of such solutions.

In 2010, the Spanish government adopted the National Interoperability Framework (Royal Decree 4/2010), again promoting the reuse of technology. This law shored up the rules on licensing (article 16), and (in article 17) bolstered the role of the CTT in hosting reusable ICT assets. Article 17 also instructs public administrations to take into account the solutions available on the CTT and other repositories, and how to make their applications available to others.

Recent Developments

Reinforced commitment

In 2015, the Spanish government reinforced its laws and policies impacting the use of free and open source software by public administrations. The government first published the "Guía de publicación y licenciamiento de activos" (Guidelines on publication and licensing of assets). The document prompts public administrations to develop reusable assets, using appropriate licenses.
A new law, 40/2015 - on the 'legal regime of public administrations' - introduced two articles (157 and 158) on aspects of reuse of ICT solutions, emphasising its value for public administrations. The law will go into effect in October 2016.

Going to GitHub

Spain has always been clear about its commitment to free software, reports the government's Centre for Technology Transfer (Centro de Transferencia de Technologica, CTT). The country's public administrations are both users and providers of free software applications. And CTT's software repository is a key instrument for the dissemination of Spain's free software solutions. By using GitHub, CTT is encouraging public administrations and open source communities to work together.

Following a global trend, over the past two years, the agency has been gradually moving functionality to GitHub. With its 11 Github projects, CTT is one of the most recent of the 19 European Member States that are hosting projects on the web-based Git repository hosting service.

Git is a source code version control system, created in 2005 by Linus Torvalds to help with the development of the Linux kernel. It is almost a default tool for open source developers that use the service to publish their code and to allow others to contribute.

Catching up on GitHub

GitHub now hosts at least 164 open source projects that are developed by public administrations in European Member States. For comparison, the total number of software projects on Joinup is 347. The total number of federated software projects is 487.

With regard to the popularity of the service, in 2016 even the British intelligence agency GCHQ (Government Communications Headquarters) opened an account. The spy agency is using GitHub to publish Gaffer, a large-scale database system for graphs.

LibreCon

Spain is one of the European Member States where the push for free and open source software is rooted in civil society and in industry. This is reflected in the size of its annual national free software conference, LibreCon. This is the successor of the Open Source World Conference, organised since 2004.

LibreCon:

- 2016 Bilbao (Basque Country)
- 2015 Santiago de Compostela (Galicia)
- 2014 Bilbao (Basque Country)

Open Source World Conference/Free Software World Conference:

- 2012 Granada (Andalusia)
- 2011 Zaragoza (Aragon)
- 2009 Cáceres (Extremadura)
- 2008 Malaga (Andalusia)
- 2007 Badajoz (Extremadura)
- 2006 Malaga (Andalusia)
- 2005 Mérida (Extremadura)
- 2004 Malaga (Andalusia)

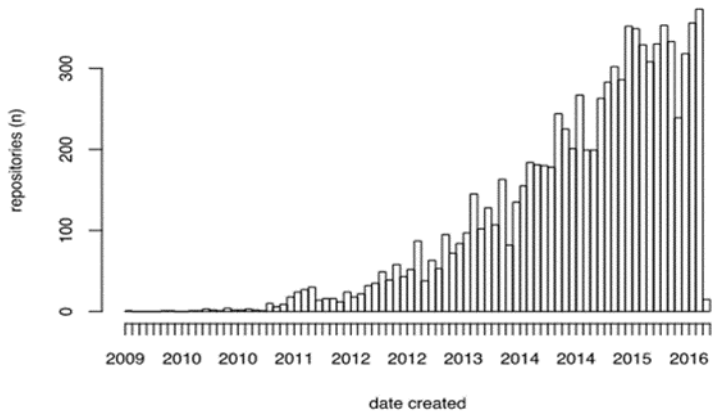

Figure 1: Governments GitHub Repository count by date created

Emanuel Feld, an open data researcher currently working for the Government of the District of Columbia in the US, has taken a closer look at the GitHub activities of the world's public administrations. "Governments have been flocking to GitHub", Feld writes. And they're bringing their staff members.

Feld at first assumed that most contributors to government projects on GitHub were "techies", used to working with modern development environments, as well as some open source advocates who had started to work for public administrations. However, on closer inspection he found that most of these code contributors had not been on GitHub before, and must have arrived there via their government projects. "Git and GitHub are not the sum total of modern development. The two are interesting because they facilitate many ideals of government

technology's new wave, including openness, collaboration, sharing and reuse, while being so flexible that appropriate practices are not a given," Feld told 18F, a consultancy working for the US government. "The challenge is training people in the mechanics of the tools, as well as the culture to make the tools worthwhile."

Selected news and studies

Open source empowers city archive Hospitalet
Castilla-La Mancha nurtures open source sector
Galicia publishes CeMIT classroom management system
Cenatic inventories commercial open source support
Open source used to manage Figueres' environment
New Extremadura Govt to support open source in schools
Andalusia provides messaging services for 4 euro (!) per user per year

Basque Country nurtures its open source ICT service sector service

Policy Recap

Reuse strategy

Building on Spain's 2010 Interoperability Framework, the Basque government in 2012 adopted its own laws and regulations to nudge its public administrations to share and reuse ICT solutions. Decree 159/2012, of August that year, for instance, details how to share and reuse applications. In October, the region clarified its criteria on openness, and added a semantic model, to help dissemination.

That year, the region also established a sharing and reuse portal, the Open Source Computer Application Directory. This now redirects to the region's open data portal; all open source activities have since been moved to the region's open source resource centre SALE - part of the Basque Country's Informatics and Telecommunications Department.

SALE was established in May 2010, to promote the adoption of free software in the region's public administrations. The centre is directly involved in implementation of this type of software solutions by the regional government itself.

Recent Developments

Growing an ICT service sector

The Basque Country illustrates the success of Spain's overall push to free and open source software. The policies adopted by the government of this autonomous region have helped to increase the number of ICT service specialists.

The segment is growing fast. The revenue and number of IT workers employed by open source service providers in the Basque Country nearly doubled in 2015, according to figures published by a regional trade group for the sector, ESLE. The combined 2015 revenue of the nearly 40 companies that ESLE represents is EUR 58 million, compared to EUR 31 million the year before. The number of workers grew by 413. Altogether, ESLE members now employ 1033 people.

Open source projects in the Basque Country are financed through the "KZ Lankidetza" programme. This is one of the projects managed by the Basque Business Development Agency SPRI, which has strong ties to ESLE. "Lankidetza" is the Basque term for connected and collaborative work. All of the open source software projects financed SPRI can be found on ESLE's repository. It currently hosts over 80 such projects.

Factotum

Through its KZ Lankidetza programme the Basque government spurs the region's businesses to increase their use of ICT solutions. The project favours collaboration, getting companies to work together and promoting trade associations. In recent years KZ Lankidetza has reinforced associations of carpenters, electricians, smelters, and handymen. The project also works with the region's maritime industries, dairy industry and medical associations.

Selected news and studies

Half of IT in Bizkaia province to be open source
Basque parliament adapts workflow to eID tool
Education is key to Basque free software policy

Estonia overcomes many hurdles

Policy Recap

Principled

Estonia's open source activities first took shape in 2007. That year, the government adopted the Information Society Strategy 2013, which called for the establishment of a competence centre and repository to focus on open source software and emphasise the reuse of solutions developed for the country's public administrations.

The strategy laid down guiding principles on openness, reusability and technological neutrality for ICT solutions. These require public administrations to justify the use of closed standards. It also prompts them to reuse solutions, and, when creating new solutions, to make these available as open source. To do so, the strategy recommends the use of the European Union's public software licence, the EUPL, as well as the European Commission's Open Source Observatory and Repository, OSOR.

"When procuring software, free software alternatives must be taken into account", reads the principle on "Technology neutrality and adaptability". It goes on to say: "In order to guarantee equal treatment of solutions, when the public sector orders functionality it is recommended also to order the infrastructure changes needed to realise this functionality. Information systems interfaces must be created in a technology-neutral way, using open specifications."

Recent Developments

Open by default

Estonia aims to make its ICT open source by default. "Open source, open development and open application programming interfaces are our key principles", says Andres Kütt, lead IT Architect working for the country's information system authority (Riigi Infosüsteemi Amet). But, he says, "We still have a long way to go, before all systems adhere to these principles."

Estonia's policies on open source have deep roots (see Policy Recap, above). In the past few years, the country has moved from conceptualising to implementation, Kütt says. However, there is one more policy that he and his colleagues are still putting into place, in papers, as actual code, and as tangible reference architectures.

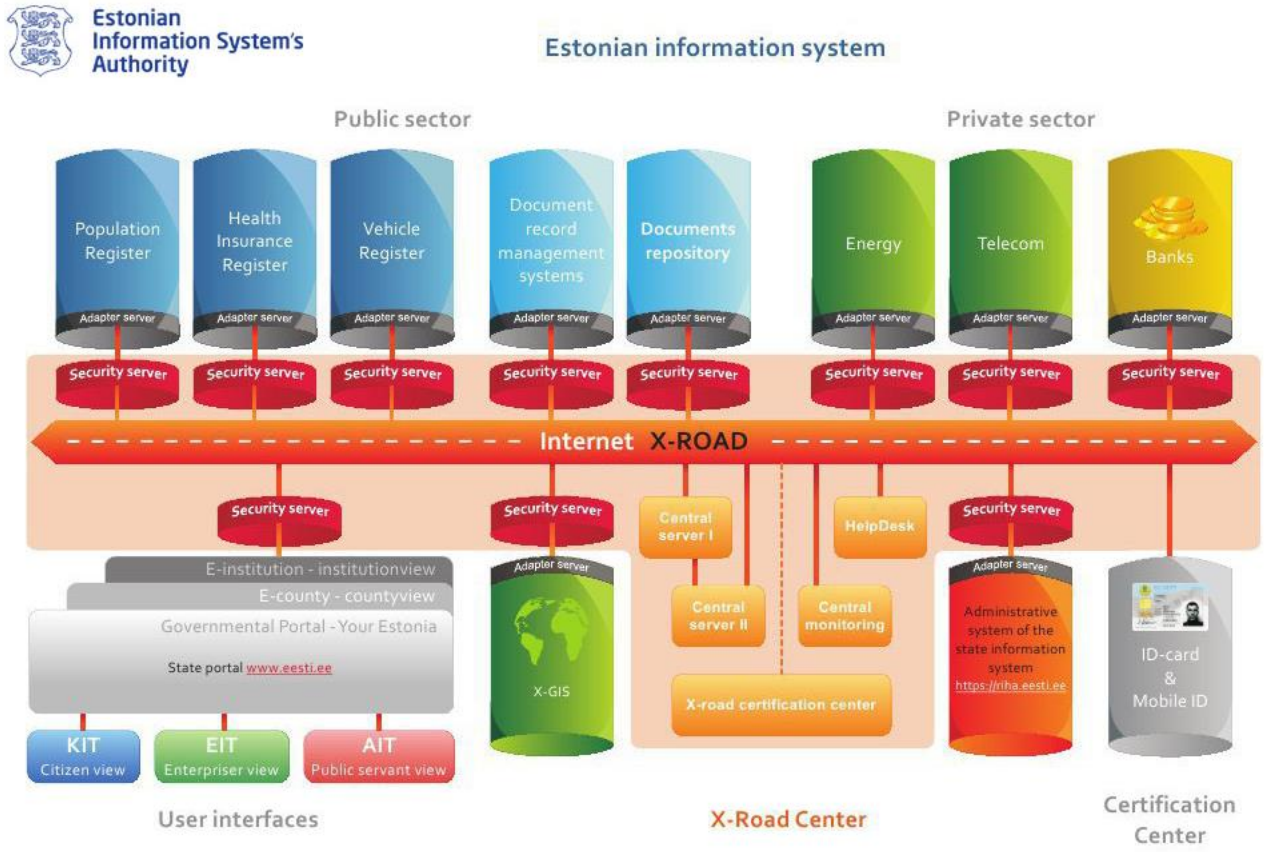

Figure 2: X-Road, the backbone for e-Estonia

API-first government

The keys to unlock the country's ICT systems are application programming interfaces (APIs). These programming instructions allow other software applications to use API-enabled systems as building blocks, accessing data, services or processing functionality as needed.

"Estonia's open API policy will help overcome one of the biggest hurdles: how to unite diverse systems?", Kütt says. "We have several systems generating huge amounts of data and services. Public administration agencies can access these systems directly and securely, knowing the data is correct."

The challenge is to turn all this data into meaningful information. "Open APIs will allow systems, data and services to do just that, Kütt says.

Open ecosystem

Estonia's government will continue to make the software solutions that it develops available as open source. The most famous example is X-Road, the backbone of the country's information exchange system. The system links eServices databases, in both the public and the private sectors. The system queries and writes databases, can transmit large datasets, and performs searches involving multiple databases. All of X-Road's data exchanges are digitally signed and encrypted.

X-Road is the basis for a data exchange platform that was developed by Finland and Estonia, the first two nations in Europe to jointly develop such a solution. The project allows databases in countries to interface, assists with cross-border services, and makes eServices accessible to Estonian and Finnish citizens.

A second example of Estonia's growing collection of open source solutions is document management system Delta. This DMS is used by many Estonian agencies. The software is based on the Alfresco DMS, and the code is published using the same licence, the GPLv2.

Estonia's information system authority is currently working on an information system registry. This software is being developed as open source, and its data will be made available as open date. Importantly, reuse of the software is taken into account from the start, says IT architect Kütt: "This way, we're gradually creating an ecosystem of open tools around the key pieces of our ICT infrastructure".

Staying in control

The IT architect says the transition to open source can be tricky. To illustrate, he recounts the agency's struggle in publishing the source code for one of its software solutions. The decision had been made officially, and the code was about to be published as open source.

The plan fell apart when the agency discovered that one essential software utility was available in binary form only, and the information system authority did not have the rights for redistribution.
"We had a big argument with the supplier, but failed to get control over the code", Kütt says. "Issues like this don't deter us. We will continue to push towards open by default."

Advocacy

Estonia has an active free software advocacy group, Avatud Lähtekoodiga ja Vaba Tarkvara Liit (Alvatal). An example of the group's work has been helping schools in the city of Tallinn to move their PC workstations to open source software. Between March 2014 and September 2015, Alvatel and the Tallinn Education Board implemented Ubuntu Linux on 4,000 out of a total of 6,000 workstations and laptops the Board manages across the city's 50 schools.

France: public source code should be public

Policy Recap

Circulaire Ayrault

France's main policy promoting free software is the Circulaire Ayrault, published in 2012. This guideline favours the use of free software by all of France's public administrations. It requires organisations to make "a systematic review of free alternatives when doing development and major revisions of applications."

The second strong impetus is given by the interministerial working group on open office productivity tools (Mutualisation interministérielle pour une bureautique ouverte, MIMO). Of France's 17 ministries, 11 are involved in MIMO, joined by France's largest research organisation (CNRS), the institute for health medical research (Inserm), and the agencies for family welfare (CAF). In recent years several city administrations have joined MIMO, and in 2014, MIMO's parent organisation, DISIC, renewed its 2008 association agreement with Adullact, the platform for French civil servants working on free software.

With Adullact's over 300 members, MIMO's reach already crossed the country's borders to include Belgium's federal government services. Yet in 2014 MIMO even crossed the Atlantic, thanks to the personal membership of one of the staff of the Free Software Resource Centre (CELL) in Quebec (Canada).

Half a million users

In 2015, MIMO expanded its reach: the responsibility of the working group now includes the selection and certification of solutions that allow large-scale desktop management, including inventory management and software deployment.

At its foundation in 2005, MIMO was to introduce free software office tools. In 2012, the group decided on LibreOffice, and this suite is now installed on nearly all the 500,000 desktops of France's ministries: Energy, Defence, Interior, Economy, Justice, Agriculture, Culture and Communication, Education, Finance, and two ministries that joined in 2015: Health and Social Affairs, and Foreign Affairs.

Currently, MIMO's biggest task is updating its selection of free software. The 2016 edition of this Socle Interministériel de Logiciels Libres (SILL, the inter-ministerial free software base) was published in December 2015.

SILL is available as an online descriptive list. The selection of applications intended for desktop workstations is available as a downloadable DVD image. The use of SILL software is not mandatory, but the ministries have to consider the list when selecting software.

Recent Developments

Making it mandatory

France wants to make it mandatory for the country's public administrations to make public the source code of its custom-built software solutions. An amendment to France's new law for the Digital Republic was added by France's National Assembly in January 2016. It passed a first round in the Senate in May 2016 and was officially adopted a month later.

Article 2 of the République Numérique:

> *"… lorsqu'une décision individuelle est prise sur le fondement d'un traitement algorithmique, les règles définissant ce traitement ainsi que les principales caractéristiques de sa mise en œuvre sont communiquées par l'administration à l'intéressé s'il en fait la demande."*

Our translation:

> *"… when an individual decision is taken on the basis of an algorithmic processing, the rules defining this processing as well as the main features of its implementation are provided by the administration to the person concerned if so requested."*

The law for the Digital Republic also encourages the use of free software by the country's public administrations. This article (9) in the assembly's version of the draft law had been removed by a Senate committee, but was later reinstated.

Article 9 of the République Numérique:

> *"… Elles encouragent l'utilisation des logiciels libres et des formats ouverts lors du développement, de l'achat ou de l'utilisation, de tout ou partie, de ces systèmes d'information."*

Our translation:

> *"… They encourage the use of free software and open formats for development, for purchase or for use of all or for parts of these information systems."*

Code and taxes

The discussion by the legislature was aided by a concrete case: the making available of the source code of the income tax software. Following a two-year legal battle, the agency in charge of public finances (Direction general des Finances publiques, DGFIP) published the source code in April 2016.

The request was made by a student at the Ecole d'Economie de Paris. At the time, in 2014, the student was working as an intern at the government's modernisation agency (Le secrétariat général pour la modernisation de l'action publique).

Paris open source summit

The annual Paris Open Source Summit creates buzz around free software companies and in government. POSS is the result of the merger in 2014 of Solution Linux and the Open World Forum, two annual, Paris-based conferences. Open World Forum, organised since 2008, has over the years attracted public administrations from other member states, and both the EC's OSOR and SEMIC projects have used the conference to organise workshops, bringing together representatives from many member states.

The student wished to use the code to contribute to OpenFisca, an educational tax-application simulator. The French authority in charge of information access (Commission d'accès aux documents administratifs) gave its approval, but DGFIP refused.

In the end, it took the Paris' administrative court ("tribunal administratif de Paris") to conclude that the source code for software written by and for public authorities can be considered to be an administrative document, and therefore can be freely accessed.

Figure 3: Road to Freedom

Since the adoption of the Digital Republic, 54 'similateurs' have been publised, including OpenFisca. Four of these have been promoted with hackathons involving public administrations and civic coders. OpenFisca is now freely accessible on GitHub and on the OpenFisca forum. Axelle Lemaire, Secretary of State in charge of Digital Affairs in France, called it a "remarkable progress towards more transparency and innovation."

Public Sector Information

France's rules on freedom of access to administrative information date from the 1970's. The rules existed long before the adoption of the European Union's public sector information directive. The PSI Directive was published in 2003, and was updated in 2013.

Both DGFIP and the tribunal referred to the directive. The former used it as an

argument against publishing the code, while the later used it to rule in favour of publication.

The PSI Directive sets out rules for the reuse of existing documents held by public sector bodies of the member states. The text also instructs member states to smooth the way to letting companies and citizens use and reuse this information.

Inauspiciously, recital 9 of the directive reads: "the definition of 'document' is not intended to cover computer programmes." Recitals merely introduce the legislation; they are not the actual enacting terms, but regardless, this argument was used by DGFIP to stave of the publication of its income tax software.

History

The Paris court however, said the opposite: nothing in the directive enforces national laws to exclude software code from their provisions. The Directive merely establishes a minimum set of rules, not a maximum.

This ruling, together with the law on the digital republic sets an interesting example for the rest of the European Union.

That France is leading the discussion on free and open source policies should not come as a surprise. The country has a long history of policies promoting the use of free and open source software by public administrations (see Policy Recap 'Circulaire Ayrault' above).

At all levels of government - central, regional and local- public administrations are implementing free software, working together on software development, and pooling resources. France also has multiple and well-organised advocacy groups that continue to further the debate (see 'April and Adullact ').

April and Adullact

Two strong non-governmental organisations, April and Addulact, are the cause, the effect, or - at the very least - a reflection of France's leading role in free software.

The April NGO was founded in 1996. The organisation has 4377 members in 51 countries, and that includes 9 public administrations such as the cities of Paris and Grenoble and the Provence-Alpes-cote d'Azur.

The group is politically well-connected and influential, allowing it to be a serious lobbyist and a campaign group. It is one of the main organisers of Rencontres Mondiales du Logiciel Libre (RMLL), one of France's busiest free software events, which caters to software developers and civic hackers.

Civil servants network

Founded in 2002, the Adullact association is a network of civil servants working on free software. The group actively "promotes, develops and maintains a wealth of free software useful for public administrations".

Adullact has 230 members, all of which are public administrations: municipalities, regions and health care organisations. The association offers a free software repository, Forge Adullact, where it shares 679 public administration software solutions.

Selected news and studies

France to boost uptake of free software in government

Free software support in France: new specifications include governmental agencies

France involves public to draft support contract

Free software groups protest France school software deal

France: 'tax source code will be made public'

Malta refreshes its policies

Policy Recap

Maximise reuse

Malta's 2012 Open Source policy - part of the ICT policy - seeks to maximise re-use of procured software by enabling the distribution of Government solutions as open source software.

The Open Source Software Directive, also published in 2012, aims to guide the implementation of cost-effective and non-disruptive open source software throughout government. It also seeks to maximise re-use of procured software by enabling the distribution of Government solutions as open source software. The Directive covers the procurement of open source software, including the adoption of the related open source business models throughout the public sector to facilitate re-use of such government procured software.

The Open Source Software Directive mentions, for procurement of software:

- Government shall evaluate solutions that are in part, or in full, built on open source software technologies on the same merits as other solutions.
- Government shall capitalise on open source software related investments carried out by the European Commission and EU Member states by seeking re-use opportunities on open source software and services available through the European Commission's Joinup collaborative platform. The Directive mentions, for the re-use of Government software:
- Government shall seek to facilitate distribution of open source software Government solutions under the European Union Public License.
- Whenever Government needs to procure software, it shall first take into account open source software solutions that are already well established within the Government and that provide same or similar functions. The respective Public Sector organisation shall provide adequate reasons to justify the lack of such re-use whenever requested and where applicable.

Recent Developments

Equal consideration

Malta's national IT strategy for 2014 - 2020, published in March 2014, instructs public administrations to give equal consideration to open source and closed source software.

From the document:

> *"Government will adopt open standards, encouraging the exchange of information and innovation, while seeking healthy competition and lower costs. Equal consideration will be given to open source and closed source software."*
> *"… the lack of participation and contribution in open source communities limits the exposure of Maltese skills and the potential to increase foreign direct investment."*

The Netherlands cycles forward

Policy Recap

Action plan

The 2007 NOiV Action plan 'The Netherlands in Open Connection' (2007), was aimed at the use of open specifications and open source software in the public and semi-public sector in The Netherlands.

The objectives of this strategic plan were the following:

1. Increase interoperability by accelerating the use of open specifications;
2. Reduction of supplier dependence through a faster introduction of open source software, open specifications and the use of ODF;
3. Promotion of a level playing field in the software market … by boosting the use of open source software, and by giving preference to open source software during the process of IT procurement.

To reach these goals the action plan described a number of different policies for open specifications and open source software. A vast number of these policies directly affected the process of IT procurement within government organisations. The plan included 17 actions, including a policy on open specifications and policies for open source software.

Recent Developments

The slope of enlightenment

The Dutch government distinctly separates its approach to open source software from its policy on open standards. The use of open standards is considered self-evident. Public administrations are expected to use open standards, or else explain why they are making an exception.
Progress on the use of open standards is monitored by the Dutch Standardisation Board and Forum (Forum Standaardisatie). It's most recent, 2015 annual report (published in early 2016) shows that in almost three in every four (71%) procurement requests, open standards are required.

However, virtually no public administration ever requires the Open Document Format (ODF). "The use of this standard is too low", the forum writes. On the plus side, a growing number of civil servants have LibreOffice on their workstations, the office productivity suite is included in the so-called Digitale Werkplek Rijk. In September 2015, the standards board said that it would try to convince the government to enforce the use of ODF.

In October, the government agreed with the Dutch Parliament's Lower House to make open standards mandatory. A dedicated, administrative law article is expected to be introduced in 2017, as part of the Generic Digital Infrastructure.

Expectations

For open source software, the central government emphasises that it wants to create a level playing field. Government organisations are expected to be professional, and procure the best solutions for a reasonable price. When procuring new ICT solutions, open source is to be selected when it is equal or better than proprietary solutions that are offered. However, government policy experts admit that the procurement practice is not ideal.

The Dutch government acknowledges that a lack of understanding of free and open source software is hindering its uptake. A case in point is the town of Ede, for years a well-known proponent of open source. Ede has made a U-turn on its office strategy, abandoning LibreOffice and reconverting all of its ODF-documents into a proprietary document format. The town seems to have neglected change management, and faced vocal resistance from staff and council members. The newly-appointed head of IT dealt with this by changing tack.

In October, Parliament's Lower House asked the government to actively promote the use of open source software. The Ministry of the Interior will research the necessity of a knowledge centre for open source software.

Plateau of productivity

There are many examples of large-scale open source implementations by Dutch governmental organisations.

For example, DUO, the Dutch government agency managing the financing of the country's educational institutions, has switched its core services to open source. This includes an Infrastructure as a Service (Iaas) cloud computing platform.

Other examples include the central government's website, rijksoverheid.nl, which runs entirely on open source software. The country's eID solution (Digid) and the Basisregistratie Persoonsgegevens, (BRP - Basic Municipal Registry) are being built on open source software. The BRP runs on a platform combining the Java Application Server JBoss and relational database management system PostgreSQL.

Civil servants using the Digitale Werkplek Rijk will find many open source solutions on their desktop. Next to the already mentioned LibreOffice, this includes Mozilla Firefox, PDFCreator, VLC Media Player, Workrave, Blender. Many also use DocGen - a tool to create documents following the government's corporate identity specifications. The software is developed for the Dutch government, and is published as open source under the EUPL.

Here are a three of the more recent Dutch government projects that involve open source software:

- Geozet

  This is a web application that helps users to search and display geographic information. The software is available on GitHub (and on Joinup) and is licenced under the GPLv3. The application is promoted by Logius, a ministerial department that helps government organisations build eGovernment services because it complies to guidelines for web site accessibility. To see the tool in action: Over uw buurt is a service that maps permit requests and pending changes in plans and local regulation.

- Dutch government data portal

  The government data portal, which lists all the available and reusable data from the Dutch government, is a combination of CKAN, an open source management system for the storage and distribution of data, and Drupal, an open source content management system. The central government is making available its modifications to CKAN and Drupal on GitHub.

- Online ODF tests

  The government is also about to publish as open source a web service to test the Open Document Format (ODF). The development is funded by the Ministry of the Interior. The service will be available online, but is also available on GitHub, and is published under the AGPLv3.

The UK is 'making a difference by being open'

Open ICT standards are becoming firmly established across government in the United Kingdom. The results, reports the director of technical architecture at the Government Digital Service, include 25 redesigned government services, the GOV.UK Verify eID solution, increased digital support, improved digital skills in government, the Digital Marketplace, better and cheaper technology and billions in savings.

A senior technology adviser writes: "Because of the new approach to technology, building on open standards and open data, open source and open markets, government can access new and better software regularly."

In tandem, with all of its extensive reporting on all these activities, the GDS has created an online resource platform.

A healing experience

The National Health Services' Open Source Programme is about making best-practice IT solutions in health and care accessible to all. By making the software or the source code freely available and downloadable from platforms such as GitHub, open source software can be developed, improved or tailored to suit the local needs of an organisation.

The UK's publicly funded healthcare organisation hopes to make open source the default licence for all software, whether this is produced in-house or by external suppliers. NHS's Code4Health project is bringing together healthcare providers, developers and supporters to build open source solutions. The project has 30 communities, covering as many aspects of healthcare.

Examples include Open Odonto open source software for dentistry, and openMAXIMS, which guides the development of an open source electronic patient record system for the NHS. A third community working with Code4health is openEobs, a project that helps clinicians and managers ensure safer patients, safer wards and safer hospitals. A fourth project is OPENeP, aiming to deliver a suite of medicines management applications to improve the safety and efficiency of prescribing and medicines management.

A redesign of the Code4Health website resulted in govstrap.io. This ports the GOV.UK standards to the Bootstrap design framework for websites and web applications. In 2016, Code4Health was grouped under NHS Digital and made part of the NHS reorganisation focusing on sustainability.

Divided networks

The UK has a large handful of free and open source advocacy networks, many of which share members. The three main ones are:

- UK Open Source Industry Association, founded in 2011 and representing some 30 companies;
- FLOSS UK, formerly the United Kingdom Unix User Group - the UK's oldest open systems user group;
- Open Forum Europe and Community for Open Interoperability Standards; two closely-related advocacy organisations, that also focus on European institutions.

Open Source Conference

The most-influential conference for the public sector is the Open Source Conference, organised annually in London since 2013. Contrasting to similar events in other Member States, access is not free.

Other networks include focus groups within larger organisations.

Examples include the Open Source Specialist Group, part of the British Computer Society, and the BBC Open Source group, which brings together the many open source projects at the public broadcaster.

In Italy, the law makes open source a question of ethics

In Italy, using free and open source software is a question of ethics, agree those who advocate the use of this type of software public administrations. Faced with neither carrot nor stick, government organisations must choose for themselves whether or not to follow the country's Codice Amministrazione Digitale.

Article 68 of the Codice Amministrazione Digitale, published in 2013, makes it mandatory for Italy's public administrations the use of free and open source software. The first part of the article reads:

1. *Le pubbliche amministrazioni acquisiscono programmi informatici o parti di essi nel rispetto dei principi di economicità e di efficienza, tutela degli investimenti, riuso e neutralità tecnologica, a seguito di una valutazione comparativa di tipo tecnico ed economico tra le seguenti soluzioni disponibili sul mercato:*

a) software sviluppato per conto della pubblica amministrazione; b) riutilizzo di software o parti di esso sviluppati per conto della pubblica amministrazione; c) software libero o a codice sorgente aperto; d) software fruibile in modalità cloud computing; e) software di tipo proprietario mediante ricorso a licenza d'uso; f) software combinazione delle precedenti soluzioni.

Our translation:

1. *Public administrations must acquire computer programs or parts thereof as a result of a comparative assessment of technical and economic aspects among the following solutions available on the market:*

a) develop a solution internally; b) reuse a solution developed internally; c) obtain a free and open source license; d) obtain a proprietary license of use; e) a combination of the above.

The translation was published in a paper in the International Free and Open Source Software Law Review, by Simone Aliprandi and Carlo Piana, two Italian lawyers specialising in free software matters. They add:

"The law is the farthest-reaching law to date favouring the use of free and open source software in the public administration and the general openness of their IT systems to create a public commons created by public money. The decision was made in a dire situation of the national economy and inspired by practical reasons (spending review) rather than idealistic ones. It seems however a new direction that can hardly be changed. Only it can be made less compelling by a slack implementation, if not outright non-compliance."

Crippled

The best-known open source implementations in Italy all refer to Article 68 in their motivation. For example, Article is mentioned regularly in presentations by General Camillo Sileo of the Italian Ministry of Defence. The ministry expects to save EUR 26 - 29 million over the coming years by switching to the LibreOffice suite of office productivity tools. Other public administrations referring to Article 68 include the Umbria region, the Emilia-Romagna region and the province of Trentino, all of which have successfully switched to free and open source.

However, advocates agree the law is mostly ignored. "There is so much confusion in Italian software procurement, that laws alone can do very little", comments Carlo Piano.
Notably the law's standard-bearer, the Agenzia per l'Italia Digitale (the Agency for the Digitalisation of the Public Sector) is ignoring article 68, says Italo Vignoli, spokesperson for the Open Source Initiative, and one of the main promotors of LibreOffice, in Italy and beyond. Article 68 has been crippled, says Sonia Montegiove, who works for the government of the Province of Perugia, and is one of the country's most-prominent free software proponents. "It is one of the most-disregarded articles of the Codice Amministrazione Digitale. It lacks checks and sanctions, and without encouragement from the central government, public administrations can ignore it."

Bulgaria's next-generation, central open source hub

In June 2016, the Bulgarian parliament approved plans to start a repository for software developed by or for the government. The source code store is to be managed by a new organisation, the eGovernment Agency.

The eGovernment Agency is made responsible for implementing state policies on:

- eGovernment;
- eCertification services;
- eIdentification;
- network and information security; and
- spatial information;

The eGovernment Agency is also tasked to guide the government on these and related topics, to help set priorities, and to coordinate and monitor developments. The Agency will also coordinate with the European Union and other Member States.

Importantly, an amendment to Article 18 of the country's 2007 eGovernment Act proposes to 'implement and maintain a public, national source repository and revision control system for source code and technical documentation of information systems in public administrations'.
Also crucial is Article 58a, Sub-article 1, Points a, b and c:

> *58а. (1) При изготвяне на технически и функционални задания за провеждане на обществени поръчки за разработка, надграждане или внедряване на информационни системи и/или електронни услуги административните органи задължително включват следните изисквания:*
>
> *1. когато предметът на поръчката включва разработване на компютърни програми,*
>
> *а) те трябва да отговарят на критериите за софтуер с отворен код;*
>
> *в) тези случаи всички авторски и сродни права върху съответните компютърни програми и техният изходен програмен код, чиято разработка е предмет на поръчката, трябва да възникват за възложителя в пълен обем, без ограничения в използването, изменението и разпространението им;*
>
> *с) разработка трябва да се използват хранилището и системата за контрол на версиите, поддържани от агенцията съгласно чл. 7в, т. 18;*

Our translation:

> *Article 58a. (1) In preparing the technical and functional assignments for public procurement to develop, upgrade or implementation of information systems and / or electronic services, administrative bodies must include the following requirements:*
>
> *1. Where the subject matter of the contract includes the development of computer programs:*
>
> *a) the computer programs must meet the criteria for open source software;*
>
> *b) all copyright and related rights on the relevant computer programs and their source code, whose work is the subject of the contract, should arise for the principal in full, without limitations in the use, modification and distribution;*
>
> *c) the repository and revision control maintained by the Agency in accordance with Article 7c, Point 18 should be used for development.*

All projects will most likely be mirrored to GitHub.

This is a giant step that sets a shining example to other countries: Bulgaria is essentially instructing its public administrations to develop their IT solutions as free and open source software.

Poland's new eStrategy

Poland's new eGovernment strategy (2016) recommends that publicly financed software should use an open architecture, and consider publication under an open source licence. The eGovernment strategy twice emphasises the use of open source: for a new system of public registers and for an eInvoicing system that interoperates with a national document management system.

In September, Poland adopted its Program "Zintegrowanej Informatyzacji Państwa" (PZIP – national integrated digitalisation programme). This sets targets for open source, and foresees the creation of a national source code repository.

The EC is contributing to open source

The European Commission aims to use primarily open source tools in developing software that is distributed publicly. Much of the software developed at the EC's Directorate General of Informatics (DIGIT) already uses open source. Over the next 3 years, DIGIT will push to make 'open source first' the target for all the new EC software development projects.

The European Commission also wants to make it easier for its software developers to submit patches and add new functionalities to open source projects. Contributing to open source communities is central to the EC's open source policy, says Pierre Damas, Head of Sector at the Directorate General for IT (DIGIT). "We use a lot of open source components that we adapt and integrate, and it is time for us to contribute back."

DIGIT aims to use the next 3 years to transform the selection of tools the EC uses for online collaboration, including content management, forums and social networks. For example, the open source content management system Drupal is already planned to run all of the European Commissions websites. Drupal will later be considered to become the EC's internal content management solution.

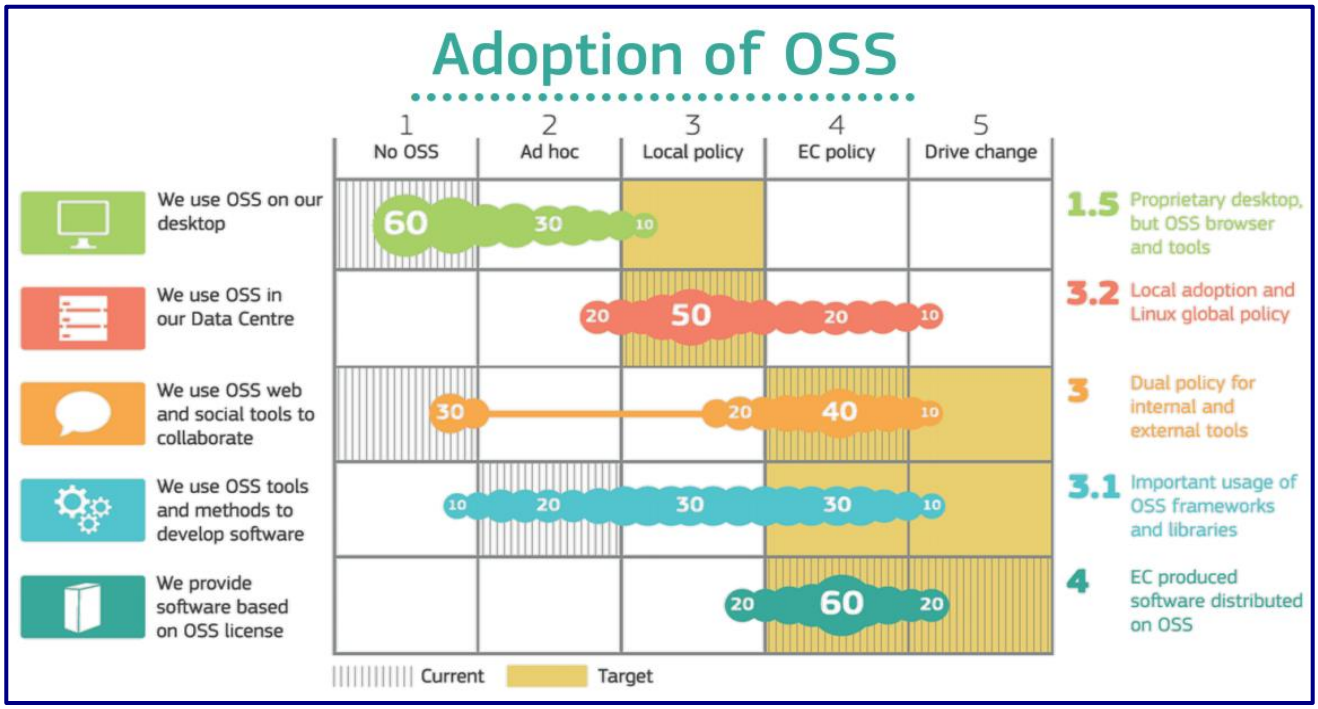

Figure 4: Adoption of open source software in the European Commission

Building blocks

A third ICT area identified by DIGIT concerns the making available of software solutions. Here the EC is already in line with its policy, publishing software through the European Union's free software licence EUPL. Examples of such solutions are CEF eID, eSignature, and eDelivery. The adoption of Linux-based solutions in the EC's data centres is also aligned with the policy. Here the strategy focuses on virtualisation using Linux.

Transform and diversify

Currently, the majority of desktop tools are proprietary, except for browsers and some other tools. The Directorate General aims to change this in the next 3 years, for instance by transforming and diversifying its office automation software. Additionally, EC units in charge of selecting products are free to define their own policies, taking account of features, total cost of ownership and risks.

The EC's Open Source Strategy was first announced in December 2014. "The strategy makes clear that there is a level playing field for open source in procurement", Damas says. "We want to ensure that open source software is considered and that there are no barriers to adoption in our procurements", the DIGIT head of sector said.

Security audits

The European Commission has started security audits of the open source software it is uses. The audits are the core activity of 'EU-Free and Open Source Software Auditing' (EU-FOSSA), a project with a budget of EUR 1 million earmarked by the European Parliament in December. The so-called EP Pilot Project was part of the Parliament's acceptance of the Commission's 2015 budget.
The EU-FOSSA project should create in a systematic approach across EU institutions, ensuring that widely used open source components can be trusted. The project will also enable EU institutions to contribute to the integrity and security of key open source software.

In preparation, in 2015 and 2016 the project reviewed 15 ongoing software development projects. It concluded that the European Commission and the European Parliament generally use open source tools and methods for software development. The institutions' project management tools make room for agile, collaborative development cycles.

Modern cross-border public services

The benefits of open source software for the creation of modern and interoperable cross-border public services are recognised in many European initiatives. In particular, open source is supported by the Interoperability Solutions for Public Administrations Programme (ISA² Programme). It funds the development and sharing of common software solutions under an open licence, and, with its Open Source Observatory (OSOR) promotes the use of open source software in the public sector.

TECHNOLOGY SHIFTS

Introduction

The section, 'Technology shifts', reports on five public administration IT trends where we believe that open source is having a particular impact. Here is the list:

- Big Data;
- Cloud Computing;
- Geographic Information Systems;
- Support for Open Document Format;
- Open Data; and
- IT security.

This part of the report is based mostly on the news items and case studies published in the "Most shared, most reused" section further below

Big Data

Across Europe, public administrations are turning to free and open source software solutions to get to grips with massive amounts of data and service requests. On OSOR, a few clues suggest that by using free software, governments can sustain the creation of ever more and ever larger big data projects.

First, a few recent examples. The government of the Basque Country in Spain is relying on open source big data solutions to manage a large-scale distributed storage platform. The system manages most of the file needs of the autonomous region's government, handling over one million requests per day.

The systems allows the secure and managed exchange of files between applications hosted in the computer network of the Basque government and in networks of other organisations. The Basque Country big data implementation combines Apache HBase, a distributed database management system and the Hadoop distributed storage solution. Search functionality is provided by Elasticsearch.

Future-proof

In the Netherlands, the Internet domain name registry SIDN has combined open source solutions to build its own big data platform – shared as open source – to store some 145 billion records containing information on the DNS queries received by the authoritative name servers of the .nl zone. The Internet Research and Investigation Network of the Dutch police uses the open source cloud solution Openstack. According to Peter de Beijer, iRN project manager, the amount of data keeps growing: "Only by using cloud solutions can management and development remain compact. Openstack is scalable, and since it is open source, it is future-proof."

In Portugal a mix of Apache components – Spark, Hadoop and Kafka – is used by the Segurança Social to detect and prevent fraud.

In France, the relational database system Postgresql is the engine for the Caisse Nationale d'Allocations Familiales (CNAF). This organisation is responsible for some EUR 69 billion in benefits distributed to 11 million claimants.

At the Vatican Library (Biblioteca Apostolica Vaticana) in the Vatican City, the Apache Hadoop distributed storage solution is one of the main components of a long-term digital conservation project. The library runs many servers on the CentOS Linux distribution.

The combination of open source and open standards ensures long-term preservation of electronic records and prevents IT vendor lock-in, says Luciano Ammenti, head of the Vatican Library's IT department. He has made open standards and open source solutions a key part of a long-term digital conservation project. The library stores tens of thousands of manuscripts and documents, including the main ancient sample of the Greek version of the Bible, monastic collections from the medieval period, the Codex Borgianus and a fifteenth-century copy of the Mishneh Torah.
Open source software solutions will play a major role in Internet development research projects that are funded by the European Commission, says Federico Facca, a computer

scientist involved in the EC's XIFI project. XIFI is preparing large-scale test infrastructures for a next-generation Internet and for smart cities.

By switching to open source, public administrations regain financial scalability. A clear example reported by OSOR is DUO, a government agency in the Netherlands that manages the financing of the country's educational institutions. The agency has over 2,000 employees, including 500 IT staffers. It is responsible for the salaries of teachers and other educational staff, manages the financing of school buildings, provides services for state examinations and handles student grants.

DUO is switching many of its core customer-facing ICT services to an open source business platform. OSOR quotes Jan-Taeke Schuilenga, IT architect at DUO. "We had reached the limit of proprietary licence possibilities. Switching to open source gave us freedom of choice."

Motivated by the success of DUO's open source implementations, the Overheidsdatacenter (government data centre) in Groningen, (ODC Noord), the data centre used by DUO, is now implementing several Big Data solutions, combining OpenStack, Ceph, Hadoop, ELK, Mathlab, Rstudio, Qgis, Rapidminer and other open source solutions.

OSOR found a similar example in Ireland. Here, the freedoms that come with open source software licences have set the country's tax authorities free to scale-up their enterprise search. On top of that, using Apache Solr has greatly improved the ability to find information on the organisations Intranet and across the many network drives at the Office of the Revenue Commissioners. "To manage the growth of information here, would be unaffordable with proprietary licences", says Cleo O'Beirne, Content Team Manager at the Revenue Commissioners.

Open source solutions are "massively cost-effective", points out Mark Dearnley, the Chief Digital & Information Officer at the UK's tax authority, HMRC. In 2014, he announced that HMRC would increasingly switch to open source to improve IT and reduce costs. With an estimated GBP 35 million in taxes uncollected every year, HMRC has a clear business case to improve its IT systems.

Cloud Computing

In all Member States, public administrations are studying, piloting and transitioning to cloud computing. There are plenty of examples where open source cloud solutions are implemented, as well as cases that show how public administrations can't resist the pull of proprietary cloud solutions. Practice looks to be ignoring the warnings over standards, interoperability and lock-in.

Such warning were issued as far back as 2012 by the then European Commission Vice President Neelie Kroes in a speech to the World Economic Forum in Davos (Switzerland). "cloud computing will change our economy," she started off, before warning of the risks. Kroes called for a European cloud partnership to come up with common requirements for cloud procurement, including standards, security, and ways to ensure competition instead of lock-in.

Four years later, the EC still issues cautions about lack of interoperability and portability in cloud services. Closed platforms do not satisfy users' needs, said Günther Oettinger, the European Commissioner for Digital Economy & Society, addressing the Net Futures conference in Brussels in July 2016. He urges industry-friendly open source licenses to become the norm.

U-turn

An example of how cloud services can hinder the uptake of open source comes from the government of Italy's South Tyrol region. In April 2016 the province made a U-turn, dropped its LibreOffice project and announced a switch to a proprietary cloud-based office service.

"Our decision was not a choice between open source or not," said Councillor Waltraud Deeg, who is responsible for the department for public administration. "We took a strategic decision to transfer basic services to the cloud, with the aim of fostering a more efficient and up-to-date way of working. We are not about to buy licenses, but a service."

"The budget for the LibreOffice project has been scheduled, but it will no longer be required," she added in an email to OSOR. "I'm opposed to the religious wars typical of IT," a local newspaper quoted Deeg as saying. "Open source is good, but it can't solve everything."

Learning curve

There are many illustrations of public administrations harnessing open source cloud computing solutions. Norway's national open source foundation Friprogforeningen has switched its online services platform to the Moodle learning management system. The new Frikomport software as a service will be available in two versions, one for municipalities and one for the country's universities and colleges.

Friprogforeningen grew out of a project started in 2006 by the Region of Kongsberg, using a portal to coordinate and administrate courses and trainings for municipality staff. Three years later, the online service was used by nearly 60 municipalities, and in 2013 the services were used by seventy municipalities, universities and other organisations.

In December 2014, Lithuania started offering the country's public administrations a cloud-based document management solution. The solutions is included in SIRIP, the country's central eGovernment services solution.

Out of 3500 public administrations and government institutions in the country, 2500 do not yet have a document management system, the government explained. By including such a solution in SIRIP, the government aims to boost the use of eGovernment services.

In July 2015, the French IT press reported that the Interdepartmental Directorate for ICT (DISIC) had awarded a first contract for a EUR 1 million Government Cloud. The cloud is to cover the needs of nearly all ministries, including the Ministry of Foreign Affairs, Defence, Education, Agriculture, Justice, Social Affairs and Health and Labour and Employment. Requirements include interoperability with Open Stack, an open source cloud-computing platform.

And in 2016, Spain's Ministry of Finance and Public Administrations has published as open source 'Archive'. This web-based solution creates archives of electronic files that are stored in compliance with the country's eGovernment and interoperability regulations.

Forecast

Lastly, in many countries, cloud computing is still under observation. Only marginal parts of governmental IT services can be moved to public cloud services, rather than the whole of government IT, warned Jaques Marzin in November 2015, then France's Chief Information Officer. "Nobody wants us to put tax records or criminal records in the public cloud. But those are government operations that amount to terabytes of data", he said, adding that the government also lacks the money to transfer operations to the cloud.

In August 2015, the government of Portugal announced a policy on cloud computing, following a study by the country's Agency for Administrative Modernisation (AMA). The policy aims at achieving rationalisation, flexibility and openness of cloud solutions.

European Cloud Initiative

The European Cloud Initiative aims to build trust and confidence in cloud computing in Europe. Through European-wide solutions the Commission will address users' concerns, support the development and use of cloud services in all sectors of the economy, and maximise the growth potential of the digital economy in Europe.

The European Cloud Initiative is to be delivered at the end of 2016. It is one of 16 initiatives of the EU's Digital Single Market strategy, adopted on 6 May 2015. This strategy aims to open up digital opportunities for people and businesses, and enhance Europe's position as a world leader in the digital economy.

In 2016, Germany's Federal Office for Information Security ('Bundesamt für Sicherheit in der Informationstechnik', BSI) published a list of security requirements for cloud services. Their catalogue is aimed at providers of cloud services and their clients, and a first attempt to create a base line for security in cloud computing.

Geographic Information Systems

Open source is winning over geographers, urban planners, foresters and environmental researchers in public administrations. That is the impression gained from OSOR news in recent years when it comes to geographic information systems (GISs). Even allowing for selection bias, the stories are convincing.

Take for example OpenADS, a GIS solution for managing building and zoning permits. Its development is strongly supported by Marseille, France's second-largest city. In June 2016, Marseille and OpenMarie, a community of public administrations working on open source software, started the OpenADS working group. OpenADS aims to bring together the many public administrations that use the software, and to manage the development roadmap. According to those involved, OpenADS is now the fifth most used solution for zoning and building.

Saving millions

OpenADS was also implemented by an organisation for inter-municipal cooperation in Brittany. Here it is used to manage broadband infrastructure projects. As a result, the software is now used by 349 cities and towns in Brittany. France has close to 40,000 communes, so surely there are still a few to win over.

Similarly, Ireland's building regulations software - known as the Building Control Management System - is used by all 31 local authorities in the country. This document workflow solution was developed in 2014 for the Local Government Management Agency (LGMA). It is not directly a GIS solution, but is getting close to becoming one.

In the Netherlands, all twelve Dutch provinces estimate that since 2009 they have saved EUR 4.5 million by working together and using open source software solutions for their GISs. The twelve decided to start building communities around their open source tools in 2013.

Carbon footprint

In Italy, about a hundred municipalities are using EcoGIS to reduce their carbon footprints. The open source tool helps to map emissions data, test interventions, and monitor changes in energy consumption.

The decentralised administration of Peloponnese, Western Greece and the Ionian Islands is recommending the use of open source software solutions for its GISs. A memo from the IT department wants all public administrations to start using Qgis.

Ten years after gvSIG was begun by the government of Valencia (Spain), the gvSIG community continues to show the usefulness of this open source GIS suite. The community shows how gvSIG is used by public administrations in Spain and Italy to collect, manage and analyse information on gas pipelines, create hiking trails, examine city commerce, and plan public transport networks.

Are³na and Elise

The European Commission's Reusable INSPIRE Reference Platform, better known as Are³na, assists geographic information systems professionals in Europe's public administrations. The platform offers a plethora of GIS solutions and GIS services, all related to the 2007 INSPIRE directive. Are³na encourages GIS professionals to work together and exchange best practices and guidance, and makes it easy to share INSPIRE-related tools.

The Elise (European Location Interoperability Solutions for eGovernment - according to one of the original consultants, the name refers to his 1996 Lotus roadster) project is all about cross-border location information services for public administrations, citizens and companies. The project hopes to remove the obstacles that prevent the efficient sharing and reuse of such location services.
Elise will share tools and provide guidance on making data and services accessible, as well as embedding them in public administration ICT policies. In cooperation with Are³na, the project will pilot several location information service, for example in the energy sector, in transport, and for marine operations. Elise is to become a "gazetteer" of geographic names and address registry.

Figure 5: "Raising the bar" from ARE3NA to ELISE

Support for Open Document Format

For open source, the second most important policy decision taken by France is the 2016 update of the RGI – Référence Général d'Intéropérabilité. The RGI makes the Open Document Format (ODF - ISO/IEC 26300) the recommended standard to manage exchange between administrations and citizens.

France's choice is the second major endorsement for ODF. In July 2014, ODF became the standard for editable documents in the United Kingdom.

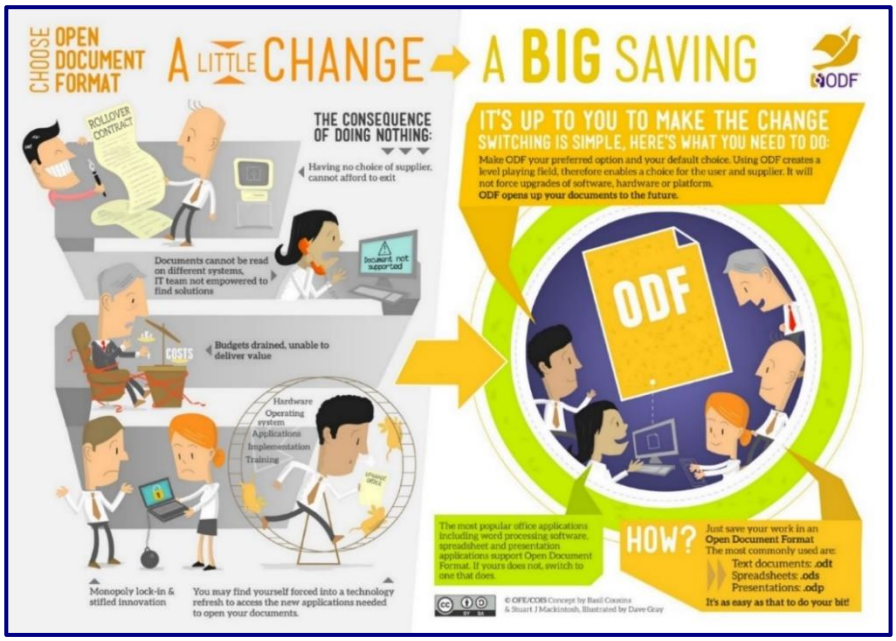

Figure 6: The ODF graphic illustration promoting ODF was created in multiple languages by the open source community, and intended for governments.

The first version, in English (pictured) was handed out at the 2014 ODF Plugfest in London, an event sponsored by the UK government.

Why is a standard for editable electronic documents important for open source?

There are three answers to this question. First, it is important because there are two competing and non-interoperating ISO/IEC document standards, only one of which (ODF) is truly open experts say. ODF is supported by the main proprietary vendors, as well as numerous open source applications.

The other (OOXML, ISO/IEC 29500) is encumbered by references to proprietary technology, brands and products. It is implemented only in the 2013 version of a proprietary suite of office productivity tools, and, according to core developers of LibreOffice cannot be completely implemented in open source software.

A second answer comes in the form of anecdotes from many European public administrations that have implemented ODF and now struggle with their peers, who are still using any of the multiple versions of OOXML. To quote Jan Verlinden, head of IT at the Belgium city of Schoten: "Public administrations that do not use open standards are working against those that do."

OSOR has aggregated plenty of examples of this fight:

- Interoperability woes keep Hungary locked-in
- Open source office at Veneto health care
- Interoperability problems frustrate authorities' move to open source
- Renewed German Swiss support office interoperability project

Third, the ODF document format is the only technical specification that has NGOs heckling public administrations to support it.

Who cares?

Apart from the NGOs, France and the UK do. France's RGI first approves the openness of ODF:

> *"OpenDocument est un format ouvert de données pour les applications bureautiques: traitements de texte, tableurs, présentations, diagrammes, dessins et base de données bureautique. OpenDocument est la désignation d'usage d'une norme dont l'appellation officielle est OASIS Open Document Format for Office Applications, également abrégée par le sigle ODF."*

Our translation:

> *"OpenDocument is an open data format for office applications: word processing, spreadsheets, presentations, diagrams, drawings and office database. OpenDocument is the designated standard, officially known as OASIS Open Document Format for Office Applications (ODF)."*

The RGI warns public administration to use OOXML with caution, because of its complexity and its lack of openness in terms of governance:

> *"Sa complexité, son manque d'ouverture (notamment dans la gouvernance de la norme) et le strict respect tardif de la norme par Microsoft même n'ont pas permis de réviser son statut. La version « transitionnal » de la norme n'est quant à elle pas recommandée. Pour des besoins d'échanges d'informations sous forme de tableaux qui notamment embarquerait du code, l'utilisation d'OOXML peut être une alternative. C'est toutefois une pratique à encadrer."*

Our translation:

> *"Its complexity, its lack of openness (especially in the governance of the standard) and problems with strict compliance even by Microsoft itself, prevent us from revising its status. The "transitional" version of the standard is not recommended. For purposes of exchange of information in tables that include embedded code, the use of OOXML may be of limited use."*

From the document Open Document Format (ODF): guidance for UK government:

> *Benefits of moving to ODF*
>
> *Open standards enable suppliers to compete on a level playing field. This competition is leading to innovative new solutions, improved processes and lower costs.*
>
> *Open Document Format (ODF) offers many benefits, including:*
>
> - *lower ICT costs;*
> - *increased flexibility;*
> - *better ICT governance;*
> - *making it easier to share documents across different software for editing;*
> - *making it possible to manage intensely cross-linked documents, such as legal texts and legislation;*
> - *allowing multiple output sources, e.g. to a website, to a printer, or to specialised accessibility equipment;*
> - *preventing problems with formatting;*
> - *allowing much stricter security checks on incoming and outgoing documents to prevent common cyber-attack scenarios;*
> - *better long-term preservation of information;*
> - *providing more choice of applications (the Wikipedia page on OpenDocument lists 26 office software applications supporting or partly supporting ODF); and*
> - *no need for plugins or converters in open source solutions like Apache OpenOffice and LibreOffice, where ODF is the default.*

Making document formats open, makes them better, the UK government explained in 2015. The UK also reported on its discussions in 2015 with proprietary vendors: "to encourage them to improve their support for open formats in order to improve users' experience when they share documents."

Open Data

The data speaks for itself: nearly all of Europe's open data portals run on CKAN, a data management system that is being developed as open source software. The Comprehensive Knowledge Archive Network started development in the summer of 2006.

Its developers, especially those working with the Open Knowledge Foundation, want CKAN to facilitate reuse of knowledge. The system, they say, should make it much easier for people to "share, find, download and 'plug into' the open knowledge packages that are produced." Two of Europe's largest open data portals, the UK's Data.gov.uk and France's Data.gouv.fr run CKAN.

List of European open data portals		
Country	**Site**	**Software**
Austria	data.gv.at	CKAN
Belgium	data.gov.be	Drupal
Bulgaria	opendata.government.bg	CKAN
Croatia	data.gov.hr	CKAN
Cyprus	data.gov.cy	unknown
Czech Republic	opendata.cz	CKAN
Denmark	portal.opendata.dk	CKAN
Estonia	opendata.riik.ee	CKAN
Finland	avoindata.fi	CKAN
France	data.gouv.fr	custom CKAN
Germany	govdata.de	CKAN
Greece	data.gov.gr	CKAN
Hungary	opendata.hu	CKAN
Ireland	data.gov.ie	CKAN
Italy	dati.gov.it	Drupal
Latvia	data.opendata.lv	unknown
Lithuania	opendata.gov.lt	unknown
Luxembourg	data.public.lu	custom CKAN
Malta	data.gov.mt	unknown
Netherlands	data.overheid.nl	CKAN
Poland	danepubliczne.gov.pl	CKAN
Portugal	dados.gov.pt	unknown
Romania	data.gov.ro	CKAN
Slovakia	data.gov.sk	CKAN
Slovenia	nio.gov.si/nio/	unknown
Spain	datos.gob.es	Drupal
Sweden	oppnadata.se	CKAN
United Kingdom	data.gov.uk	CKAN
EU	data.europa.eu/euodp	CKAN
EU	www.europeandataportal.eu	CKAN

Engine X

Most Member States implement the open data management system on top of other open source solutions. In 2014, the Romanian government used such a setup for its Data.gov.ro open data portal (officially launched in early 2015). The government runs CKAN on the Linux operating system and the Nginx web server.

The open source licence encourages public administrations to contribute to CKAN's development. In late 2015, the Greek government's open geodata platform (geodata.gov.gr) made available several tools and extensions to CKAN.

It's not just central governments who need open data portals. OSOR reported in 2014 that the Agence Wallonie de Télécommunications in Belgium's Walloon region also uses CKAN to manage its collection of open data.

IT security

Software and bugs go together. Professor Andrew Tanenbaum, the author of Minix, the IBM PC operating system that inspired Linus Torvalds to write Linux, used to say that there are at least six bugs in every 1,000 lines of code.

The good news is that open source code allows anybody to inspect the code, find bugs and fix them. "Given enough eyeballs, all bugs are shallow", wrote Eric Raymond, author of "The Cathedral and the Bazaar", an influential book that inspires many open source developers.

The ability to audit and verify code is as fundamental to free and open source software as free and fair elections are to democracy. This explains why, in March 2014, October 2015, and again in January 2016, the European Parliament called on the European Commission to systematically replace proprietary software with "auditable and verifiable open source software in all the EU institutions".

Research and develop

It explains why the European Parliament created a EUR 1 million project for the European Commission to carry out security audits of the open source software used by the institutions (EU-FOSSA), mentioned earlier.

The same argument pops up in discussions all over Europe. An example is Portugal's Laboratório Nacional de Engenharia Civil (National Laboratory for Civil Engineering, LNEC), a state-owned research and development institution. The software lets organisations inspect and audit the code without restriction, says OSOR, quoting LNEC engineer João Marcelino.

A healthcare trade group in the Netherlands, the Dutch Association of Research Quality Assurance, favours open source because it allows audit trails, a key requirement for software used in healthcare laboratories.

Popular

The European Research Council (ERC) in 2016 awarded a EUR 2 million grant for a code vulnerability review of Rust, an open source programming language that is designed to be safe. Rust is used for Mozilla's experimental web browser engine Servo.

A recent survey indicates the political and public interest in IT security audits that help to improve publicly available software. The poll was organised in June 2016 by the European Commission's Directorate-General of Informatics. The EU-FOSSA poll asked the public to help the EC decide which particular code it should audit. In just a few weeks it received over 3000 responses.

MOST SHARED, MOST REUSED

Introduction

This section, 'Most shared, most reused' lists the news items, case studies and open source solutions that received most attention. The lists are based on analysis of Joinup's web server access logs.

From the city of Munich to the Region of Andalusia

The most read OSOR news item is our July 2014 report about the famous Linux project in the German city of Munich.

In general, news that covers the software running on desktops in public administrations gets the most hits. Most read is news about authorities switching to LibreOffice and transitioning to ODF, and case studies that detail the cost reductions possible by switching to open source.

The most-read case study details how the Regional Government of Andalusia has been using mail systems based on open source software since 2001. The economic gains relative to proprietary solutions must be huge: "Vendor proposals ended prematurely when we mentioned that our present costs were around 4 euro per user per year".

Here is the list of most-read news items:

- "Munich city council shields Limux against Mayor"
- Italian military to switch to LibreOffice and ODF
- Valencia Linux school distro saves 36 million euro
- Munich now a major contributor to open source
- MEP Tarand: "EU should switch to ODF standard"

Here is the list of most-read case studies:

- Andalusia provides messaging services for 4 euro (!) per user per year
- How 17 French ministries joined forces to support free software
- eProcurement: Belgium deploys a two-system platform for e-signature
- e-Prior: electronic procurement system for public administrations
- EC consolidates hundreds of websites onto new Drupal 7 Europa platform

And lastly, here is the list of most-downloaded open source solutions.
The Joinup platform allows public administrations to publish their solutions relating to open source. Some public administrations rely on Joinup to store and publish solution they have created. Other administrations and federated projects simply link to their own websites from Joinup.
The statistics from the last two years show that solutions concerning security have been downloaded the most.

- Digital Signature Service and TLManager, provided under the CEF Programme on the use of e-Signatures
- MOCCA, provided by the Austrian government for e-card management
- Signature Verification Portal, a web-based application that allows uploading of documents with various signature formats

- Certificate Status Tool, which allows validation of X509 Certificates based on Certificate Revocation Lists
- Verinice, a tool provided by the German Federal Office for Information Security

Additionally, the most-downloaded metadata management solutions are DCAT application profile for data portals in Europe (used to classify datasets) and ADMS (for standardising software assets). Also popular are EIRA (solutions for architecture), DEMETRA+ (statistical data), and EU-Survey (data collection).

AKNOWLEDGEMENTS

Besides the people mentioned in the text, the authors wish to thank the following contributors for their help and guidance: Szabolcs Szekacs, Stuart J. Mackintosh, Clémentine Valayer, Charles Butcher, Adrian Offerman, Cyrille Chausson, Arnold Reinders, Richard Daly, Edmund Laugasson, Quinten Devreker, Miguel Angel Amutio Gomez, Elena Muñoz Salinero, and Bozhidar Bozhanov.