

# Free, Libre and Open Source Software (FLOSS)

## - Use by Governments

OASIS (Organization for the Advancement of Structured Information Standards) is a not-for-profit, international consortium that drives the development, convergence, and adoption of e-business standards. Members themselves set the OASIS technical agenda, using a lightweight, open process expressly designed to promote industry consensus and unite disparate efforts. The consortium produces open standards for Web services, security, e-business, and standardization efforts in the public sector and for application-specific markets. OASIS was founded in 1993.

The OASIS eGovernment Member Section (eGov MS) serves as a focal point for discussions of governmental and public administration requirements for e-business standardization. Bringing together representatives from global, regional, national and local government agencies, the eGov MS provides a platform for those who share a common interest in directing and understanding the impact of open standards on the public sector.

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## Overview

This paper provides advice and guidance to Governments on the use of Free, Libre and Open Source Software (FLOSS). It is one in a series of outputs that the OASIS eGovernment Member Section is producing as part of its remit to promote the adoption and implementation of open standards that facilitate interoperability within and between government agencies and all of their stakeholders, and to stimulate the sharing of best practices and examination of use cases concerning the delivery of eGovernment services.

The paper provides:

- an explanation of exactly what FLOSS is,
- a review of its rise in prominence over the last few years,
- a look at its current progress and future development,
- a detailed look at how it can be used by Governments,
- examples of current implementations,
- advice on getting started for those who haven't already embraced it.

The intended audience is:

- Government and other public sector officials responsible for eGovernment policy, strategy, and implementation.
- Other public or global Institutions that provide advice and guidance on implementing eGovernment Programmes.
- Providers of software and services to Governments.
- OASIS membership.
- Anyone wishing to learn first-hand about FLOSS.

# Part 1 Introduction

## What is FLOSS?

Free, Libre, and Open Source Software (FLOSS) has seen a tremendous growth in its adoption, and yet it is often misunderstood. In this paper we will discuss what FLOSS is about and why it matters for Governments.

FLOSS is hard to define. It can be any of the following, and often is one or two of these criteria depending on who you talk to:

- A philosophy
- Values about the digital world
- A better way to develop software
- A set of business models
- A distribution model
- The state of the art in software development
- All of the above and yet something else.

Even the acronym, “FLOSS” provides somewhat of an interesting base for discussion. It is important to clarify what free means here – it is free as in speech, not free as in spending money.

There might be many different ways for anyone to understand Free and Open Source Software, but we can nonetheless reliably define it as software that conveys 4 distinct freedoms:

- The freedom to run the program, for any purpose.
- The freedom to study how the program works, and change it to make it do what you wish. Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help your neighbour.
- The freedom to improve the program, and release your improvements (and modified versions in general) to the public, so that the whole community benefits. Access to the source code is a precondition for this.

Once you have thought about these freedoms, you might realize that the notion that software should free people and not harm their rights to innovate or to simply use software is a powerful idea. But having said that, you end up with having to implement these freedoms. There we need software licenses, and software licenses are something you have in quantity (not in quality) in the FLOSS world – see below for more details.

There is sometimes the perceived difference between Free Software and Open Source. This is a debate that is as old as FLOSS itself. Suffice to say that while Free Software tends to insist on the ethical value of freedom, Open Source tends to be more pragmatic. But the way the two concepts implement software freedom tends to be largely similar. In 80% of the cases Open Source Software can be said to be Free Software, and Free Software is almost always Open Source. Open Source emphasizes on processes, Free Software emphasizes on ethics and users' rights.

To some these distinctions are somewhat byzantine and can be seen like different organic food labels differentiating themselves in some way that may not really matter for the rest of us.

## How is FLOSS produced?

FLOSS is produced in many ways and by several different kinds of people and organizations, eg through software development projects which can be driven and populated by mere individuals, companies, universities, governments, NGOs, etc. In fact, anyone can start a FLOSS development project, but you have to respect some rules. One of them is the licence, which has to be open source or free software. Both the Free Software Foundation [ref 1] and the Open Source Institute [ref 2] provide a comprehensive list of approved licences. You may create your own, but whether you need to do that is another question.

Most of the time, these projects are developed online, with distributed teams around the world. Sometimes, this can happen inside one organization.

## Pros & Cons of FLOSS

The major pros and cons of FLOSS are as follows.

- If you wanted to keep some secrecy in your code, that's just not possible.
- FLOSS goes against any established notion of management.
- FLOSS is everywhere, anytime and always available.
- You can innovate with it.
- You gain some new potential suppliers, it's good for competition.
- You master your digital future.

If you look at this list closely, you will see that the “problem” with FLOSS is the deep change in your organizational structure it will entail if you are intending to develop it yourself.

If you are or plan to be a user of FLOSS you will still need to make some changes, particularly in your procurement methods and the understanding by your financial department – see Part 2 Procurement Issues.

On the other hand, there are some real advantages in using FLOSS. For governments, there are two main ones:

- real competition between suppliers - proprietary and FLOSS-based solutions,
- digital independence

## FLOSS vs. Open Standards

It is important not to confuse the debate about FLOSS with that about Open Standards. The latter is discussed in detail in a separate paper by the OASIS eGov Member Section entitled “Avoiding the Pitfalls of eGovernment”. Some key points to note about FLOSS are:

- You can have proprietary software using open standards.
- FLOSS can use either open standards, or open formats or protocols that are open but not standard.
- FLOSS can use proprietary standards, formats & protocols through reverse-engineering.

## The different FLOSS licenses

There are many different FLOSS licensing schemes. Here are some of the most commonly used ones:

- GPL - General Public Licence [ref 3]
- LGPL - Lesser General Public Licence [ref 4]
- Apache [ref 5]
- MIT – Massachusetts Institute of Technology [ref 6]
- BSD – Berkeley Software Distribution [ref 7]

You can basically break these down into three categories:

- Free Software,
- Open Source,
- the distinction between copyleft and non copyleft licenses.

There is almost no difference between Free Software and Open Source licenses, but some are more specifically “open source” eg MIT, BSD. The most widely recognized license is the GPL. Another one which is sometimes considered as open source and not free is the Apache license. Copyleft licensing makes it mandatory to anyone who distributes software under that license not to alter the terms of the license.

Which license should you use? Well it depends of what you want to do with your software. As mentioned above there is almost no difference between them, so you will need to do your homework before deciding which is the most appropriate for your use.

What is not Free and Open Source software? The following can be regarded as not FLOSS:

- non copyrighted software
- non “commercial” software
- public domain software
- software for extremists (only).

## Next steps in the progress of FLOSS

FLOSS is on a rising tide induced by the emergence of IT and the Internet in our societies. Some of the immediate issues for the FLOSS world are as follows:

- Challenges of Cloud Computing:
  - How open are the software platforms? Do not get caught in another proprietary trap.
  - Who owns the data? How do you enable users' freedom in your Cloud?
- Software patents – who owns the software patents for FLOSS?
- Digital content – who owns the digital content used by FLOSS?

## Part 2 – Use by Governments

### The Political Debate around Open Source

In the past few years there has been a very wide and at times acrimonious debate about the use of FLOSS, although in recent times there is a more coming together by the different factions. Much of the debate has at times been very political rather than based on the merits of each solution, for example many have seen it just as a means of breaking the domination of a few very large global suppliers and their proprietary systems. Others have argued the need for more open systems to enable interoperability and make life easier for innovation.

In the view of OASIS there is room for both, FLOSS and proprietary, and each needs to be considered on its merits.

There are differences of opinion within the open source community itself, mainly around the issue of licensing, but also about how FLOSS should be developed and maintained. All of this has made it very difficult for Governments to determine the rights and wrongs of using it and how and when to proceed. Some Government bodies like the European Commission have already made and published their decisions but others are still pondering which line to take – see Appendix A for some examples of current policies and initiatives.

### Cost benefit analysis

Governments clearly have a responsibility over how they spend public money and to that end decisions about when and how to use a FLOSS solution should be made using the same cost benefit analysis approach as with any other purchase. Best value for money has to be the bottom line but in determining that the full life-cycle costs must be assessed. And each case will be different depending on the scope of the system or service required. So the approach has to be one of providing a level playing field for all to compete in.

As with managing the public purse, Governments have an obligation to reduce the cost and especially the risks of their systems. Taking the level playing field route helps achieve this, by amongst other things acquiring best value for money, removing reliance on single providers, providing more flexibility in systems and in most cases gaining ownership of bespoke and tailored software code.

Security of Government systems is another aspect that has to be high on everyone's agenda. Concerns have been expressed in the past about the security of FLOSS systems but experience has shown that when properly configured they can be least as secure as proprietary ones. And also in their favour is the fact that they are currently subject to fewer Internet attacks.

Interoperability is now a key aspect of all eGovernment programmes. So in any cost benefit analysis the ability to have solutions that are interoperable has to be a key success parameter. Most eGovernment Interoperability Frameworks set down which standards are required to be used and these of course can be deployed as FLOSS solutions as well as in proprietary solutions.

### Examples of FLOSS usage by Governments

There are today some significant implementations of FLOSS solutions in use by Governments:

- Many Government websites use Apache as the core web server.
- Linux is used on many governmental servers, eg nuclear defence in France and NASA.
- Linux desktops are increasingly being used.



- Use of OpenOffice is increasing.
- The use of Open Document Format (ISO/IEC 26300:2006) as well as emerging open versions of previously proprietary standards (eg ISO 19005-1:2005 (“PDF”) and ISO/IEC 29500 (“Office Open XML formats”)) is gaining momentum.
- Open Source components are used in major mission critical systems, eg the UK’s Directgov and Electronic Vehicle Licensing systems.

So the confidence and experience in FLOSS solutions is increasing and the cost benefit analysis is showing that they can provide best value for money. But there are not viable, cost effective FLOSS solutions for everything and many aspects of government ICT are still, and will be for some time, provided by the major suppliers.

## Procurement issues

The critical focus of attention required by governments on the use of FLOSS arises in the procurement process and this is where those who were early adopters initially had a lot to learn. Things are gradually improving but one of the major weaknesses has been the lack of experience necessary by those involved in the procurement process to assess whether FLOSS solutions provide the best value for money. This has been down to the lack of understanding of what FLOSS provides, a lack of confidence about how it is maintained and also the lack of taking a full life-cycle view of the project. For example introducing a FLOSS solution can involve considerable re-training both of the implementers and systems support staff as well as the end-users, and very often this cost has not been properly recognised and reflected in the business case. Things are improving, lessons are being learnt, experiences are being shared, and evidence and costs are becoming more readily available.

The items listed below are the key procurement elements that need to be included in any implementation guidelines of a FLOSS Policy. They address aspects from the strategic level down through to the setting out of requirements and leading to the actual purchasing phase.

- **Increasing capability within Government:** raise the level of awareness, skills and confidence in the professions in the different licensing, support, commercial and cost models associated with FLOSS solutions.
- **Clarity in procurement:** develop clear and open guidance for ensuring that FLOSS and proprietary products are considered equally and systematically for the purpose of achieving value for money.
- **Re-use as a practical principle:** where FLOSS solutions are evaluated and approved by one part of Government, that evaluation should not be repeated but should be shared.
- **Maturity and sustainability:** FLOSS covers a multitude of products. Given the nature of Government work, a degree of confidence that a product is mature, that the code base is secure, and that the project itself is sustainable is needed.
- **Open Standards:** specify requirements by reference to open standards and require compliance with open standards
- **International examples and policies:** keep up to date with developments; actively seek examples from other countries and sectors to encourage the development of product knowledge and better challenge to suppliers.

## Getting started

For those Governments who have not yet started down the FLOSS path here are some simple steps to get you going. For those who already have a FLOSS policy or set of guidelines some of these things may help you improve what you have.

- **Write a policy or a guideline:** there are now many examples to copy, see Appendix A, and they do not need to be lengthy, complex documents. Build on the research of other Governments' policies and initiatives.
- **Communication, Consultation and Review:** communicate the policy and its associated actions widely and expand it as necessary. Engage with the open source community in this debate. There are still some strong opinions about the use of FLOSS and you need to try and take everyone with you and find the common ground. Explain in simple terms what you are trying to achieve.
- **Increase the capability within Government:** ensure you have the necessary experience within Government to implement the policy. If it's your first attempt at introducing such a policy the chances are you will not have that necessary experience, in which case you may need to buy it in or seek help from those that have already done it. Draw on best practice from other countries and institute a programme of education and capability-building for the Government IT and Procurement professionals.
- **Use tried and tested solutions:** start with the easy bits and don't be over-ambitious. There are now many tried and tested FLOSS implementations so go for those first. Follow the lead of those that have already done it before attempting new aspects. Look for maturity of solutions and good reference sites. Check the licences, talk to your suppliers, do your homework.
- **Publically funded R&D projects:** Governments often put a lot of money into Research & Development projects and do not always maximise the return on their investments. One approach is to get R&D projects that produce software as an output to provide a FLOSS version of that software. It's a simple way of making sure there is a return on the investment for the public good.

## Summary

So to summarise, here are the main messages from the eGov Member Section:

- FLOSS can play an important part in the delivery of eGovernment Programmes
- There are many mature FLOSS products capable of meeting Government requirements
- There is a lot of experience within Governments now about how to use FLOSS
- A lot more experience is needed in the procurement phase of projects to get the best value for money - be that FLOSS or proprietary
- The eGov Member Section can help you keep up to date on developments. All you have to do is join and post a question to the Member Section mailing list and we'll do our best to give you the answer direct, or if we can't, we will put you in touch with someone who can.

The simple message is don't try and re-invent the wheel, there are plenty of examples and precedents that can be re-used. FLOSS can be worth the time and effort, and if you need any further advice we are ready to help.

## Contacts and Additional Information

This Guidance Document and other documents can be obtained through the OASIS website [ref 8].

For more information on how to participate in eGov Member Section activities, please contact the eGov Member Section [ref 9]

## Appendix A – Government FLOSS policies/initiatives

This list is an example of some of the major FLOSS policies and initiatives in use by Governments:

- **UK** - Open Source, Open Standards and Re-Use: Government Action Plan ([http://www.cabinetoffice.gov.uk/cio/transformational\\_government/open\\_source.aspx](http://www.cabinetoffice.gov.uk/cio/transformational_government/open_source.aspx) )
- **Australia** - Guide to Open Source Software for Australian Government Agencies (<http://www.finance.gov.au/publications/guide-to-open-source-software/index.html>)
- **New Zealand** - Open Source (<http://www.e.govt.nz/policy/open-source>) and The Public Sector Remix Project (<http://www.scoop.co.nz/stories/SC0908/S00050.htm> )
- **India** - National Resource Centre For Free/Open Source Software (<http://www.nrcFLOSS.org.in/>)
- **South Africa** - Policy on free and open source software use for South African government (<http://www.info.gov.za/view/DownloadFileAction?id=94490>)
- **Canada** – Open Source Software Position (<http://www.tbs-sct.gc.ca/fap-paf/oss-ll/position-eng.asp>)
- **Croatia** – Open Source Software Policy ([http://www.e-hrvatska.hr/repositorij/dokumenti/downloads/Open\\_Source\\_Software\\_Policy.pdf](http://www.e-hrvatska.hr/repositorij/dokumenti/downloads/Open_Source_Software_Policy.pdf) )

## Appendix B – References

The following references are either used directly in this paper or the material within them is used to help formulate the advice and recommendations.

1. Free Software Foundation  
see [www.fsf.org](http://www.fsf.org)
2. Open Source Institute  
see [www.opensource.org](http://www.opensource.org)
3. GPL  
see [www.gnu.org](http://www.gnu.org)
4. LGPL  
see [www.gnu.org/copyleft/lesser.html](http://www.gnu.org/copyleft/lesser.html)
5. Apache  
see [www.apache.org](http://www.apache.org)
6. MIT  
see [http://web.mit.edu/tlo/www/community/software.html#Open\\_Source\\_Licensing](http://web.mit.edu/tlo/www/community/software.html#Open_Source_Licensing)
7. BSD  
see [www.opensource.org/licenses/bsd-license.php](http://www.opensource.org/licenses/bsd-license.php)
8. OASIS  
see [www.oasis-open.org](http://www.oasis-open.org)
9. eGov Member Section  
see [www.oasis-egov.org](http://www.oasis-egov.org)