



## FACT

Governments are **re-using** technology, best practice and intellectual property



## FACT

Organisations are **sharing** technology investment with other departments



## FACT

Open source solutions are **delivering** on user need and outcome



## FACT

Open Standards are **implemented** which prevent lock-in and enable choice

**#OpenSource**

# Professional re-usable software principles for the Public Sector

A practical approach to accessing Free and Open, re-usable software for use in the public sector



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OpenUK is the UK Free & Open Source industry Association. COIS is a division within OpenForum Europe (OFE) which conforms to the OFE Vision, Policies and Code of Conduct with the mission of creating a level playing field for ICT suppliers, and freedom of choice for the citizen/user by supporting the drive to adopt Open Standards through the various European public sector organisations. COIS seeks to connect the Public Sector with the technology community, guided by the UK Cabinet Office's Open Standards Principles. It is committed to transparency, remains politically and technologically neutral, is non profit & self funded with industry support and is managed by a co-operation of industry organisations.

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# Introduction & case for re-use

## Introduction

This document is designed to:

- Enable the reader to gain a balanced view of how and when to use Free & Open Source solutions
- Inform the reader about the wide freedom of choice of software applications and vendors
- Increase value delivered by existing technology providers and increase return on investment
- Help find resources, case studies, applications and tools
- Highlight risks associated with closed and proprietary software, and strategies to manage these risks

## Executive summary

The need to reduce operating costs, demand to become more efficient, and to provide more integrated services causes challenges for the public sector. This publication proposes that one strategy is to implement methods and approaches that enable re-use of technology investments, best practice, design and intellectual capital. **The key enabler for this re-use is the integration of Open Source software coupled with Open Standard interfaces.** The intention of this publication is to help the reader understand that these tools are proven, are in every day use, are mature and capable, and to explain how they can be professionally implemented within an organisation.

- Stuart Mackintosh, Chair, OpenUK - The UK Open Source Industry Association.

## Proprietary or Open Source for re-usable software?

Proprietary software is defined as having an owner with exclusive title to the code and that the code is protected or concealed. Software provided as Open Source also has an originator but is distributed with the principle that the recipient should have the choice to inspect, run, modify and in most cases re-distribute the code.

Business models in the proprietary space typically focus on models of mass distribution with extensive sales and marketing investments. These models potentially restrict the freedom of an end user organisation through restrictive license terms. Conversely, suppliers in the Open Source space focus on the outcomes of a project and pass on unencumbered access and use of the software to the customer.

Open Source software is provided with a variety of licences, some of which ensure the recipient shares the software with at least the openness that they received it. For this reason, Open Source software is generally designed for re-use where proprietary software models are designed around further licence revenue.

When software is designed around a specific need, the intellectual capital invested by all parties can become part of the design of the software. With proprietary software, all that is encapsulated within the software becomes the title of the software owner and is subject to the restrictive practices applied to the software itself. In the case of Open Source, the know-how and processes remain available and accessible to all parties.

A further benefit from the use of Open Source software is that it does not have the burden of sanctioning the user should they exceed the parameters of the licence (quantity of users, duration of execution, processors or computers the software is run on) therefore the software is more efficient.

# Acquiring professional re-usable software

Free & Open Source software is already driving functions within your daily life. It may be your web servers, network infrastructure, desk phone or conference room TV. Personal devices like your mobile phone, smart watch and tablet are likely to contain Open Source and almost all of the Internet runs on Open Source. This has all been developed using the most effective and practical solutions and without Open Source, may never have reached the depth and breadth of technical capability.

## The re-usable software ecosystem

The Open Source ecosystem offers software to address most of an organisation's every day needs. These re-usable components are created by software engineers and experts, contributing to projects where other specialists help to improve the code's efficiency and capabilities. Improved and re-released, the result is well-tested, robust and high-quality software. Organisations can export their own modifications - a by-product of the process - further contributing to a rapid evolution of the software. This sharing and iteration, improves availability, quality and security.

It is common for Open Source projects to compete in order to resolve shortcomings of earlier versions. The solution that becomes accepted is measured by the quality of the code and project. The mix of peer-review and life testing is not influenced by financial, managerial or political pressure. The only consideration is a practical one - does it do the job?

## Professional implementation

As with any form of software or technology project, implementation is highly important. Open Source Software empowers an implementer to ensure a successful outcome. Any issue with the operation of the software can be investigated and there is no limit to the amount of copies used. Open Source Software creates no artificial barriers.

## Addressing challenges of acquiring free and open software

Open Source solutions already underpin many Government designed applications<sup>1</sup> which has lead to savings made whilst enabling new service delivery solutions. However it has not been common practice to acquire ready-built Open Source products and solutions, and the majority of spend is directed to proprietary offerings. Procurement has proven a challenge for the acquisition of Open Source, as the core product is not wrapped in a manner that is easily accessible by the common procurement selection and evaluation criteria.

Despite the evidence, the Open Source ecosystem is sometimes perceived as being less credible or lacking in structure and that proprietary solutions provide better security and issue management. Open Source enables transparency and opportunities to address issues. With software produced in a way that is open to interrogation, security problems cannot be hidden and sub-optimal code can be identified and improved. Leadership and management are a part of every successful Open Source project by either the main sponsor of the code or a third party.

## Frameworks

At the time of writing, G-Cloud<sup>2</sup> hosts over 1500 services registered as Open Source covering many commodity lines of business.

For bespoke requirements or for solutions not available through G-Cloud, the Digital Outcomes & specialist frameworks<sup>3</sup> provides access to pre-screened development services and many of the providers offer Open Source services.

<sup>1</sup> <https://www.digitalmarketplace.service.gov.uk/g-cloud>

<sup>2</sup> <https://www.gov.uk/guidance/digital-outcomes-and-specialists-buyers-guide>

<sup>3</sup> <https://blog.quickpeople.co.uk/2013/05/17/the-uk-government-pays-me-to-write-open-source-all-day/>

# Selecting and evaluating software and suppliers

## Adoption vs professional implementation

Adoption has proven a common way to implement Open Source within organisations. With single purpose applications that connect to commodity services through Open Standards such as web browsers and word processors, adoption has provided a cost effective acquisition method.

The shortcoming of the adoption approach is that it provides no guarantee of security and suitability. Bypassing the procurement function can mean that critical business software has no diligence applied and that the software is untracked within an organisation. Where the customer is able to maintain updates and satisfy themselves that this does not present a risk, this process is cost effective to operate and manage. Where the requirement is complex or the necessary skills are not locally available, professional services from subject matter experts should be sought.

## Supplier engagement

Early engagement is to the benefit of all parties. It enables the buying team to get to know the supplier and assess potential solutions. Where early engagement is not carried out, the cost for the supplier to bid increases and that cost will be ultimately borne by the customer. Suppliers should only be engaged if there is serious intent to proceed with an Open Source solution and suppliers should not be used purely to evidence compliance to the Government Open Source first policies.<sup>4</sup>

## Short listing suppliers and solutions

GDS have published extensive evaluation and selection guidance<sup>5</sup> for creating and managing a short-list of suppliers. Consideration should be given to the business model of the supplier as this is an indicator as to the value that they deliver.

## Assessing Open Source options

Business models vary for Open Source applications and there are subtle differences between services that are built on Open Source and services that are

available as Open Source. As the desirability of Open Source increases, existing proprietary suppliers are adapting their business models to use Open Source as a marketing process for locked down applications. One example is Open Core where the base software is Open Source but key functionality is only available with pay-for modules. An assessment tool is available from OSSWatch<sup>6</sup>, created by the University of Oxford, to assess the openness of a project.

## Choosing an Open licence

When selecting or integrating Open Source software, the licence accompanying the software will affect what you can do with the software, and when developing, your choice of license will impact what others can do with it. GDS offer guidance<sup>7</sup> and Joinup.eu<sup>8</sup> offer a tool to assist with selection. The EUPL licence has been developed by the European Commission specifically for use by Commission services. There are times when it may not be desirable to export digital assets<sup>9</sup> implementation details and configuration could be exposed.

## The Custodian model of engagement

The Custodian model has been pioneered by Open Source foundations for decades and commercially focused organisations are being established to replicate this proven method. This model separates the key roles of the software life cycle and empowers the customer to be in control of their project. A Custodian retains title to the software application and competing companies offer development, integration, training and support services. A recent example is Apperta<sup>10</sup>, the NHS Open Source foundation who is controlled by a board of clinicians with NHS England as an institutional director and direct the Code 4 Health<sup>11</sup> programme. This process ensures that the software remains under the control of the public sector whilst value services are delivered by private sector organisations.

4 <https://www.gov.uk/guidance/talking-to-suppliers-before-you-buy-digital-marketplace-services>

5 <https://www.gov.uk/guidance/how-to-shortlist-digital-outcomes-and-specialists-suppliers> <https://www.gov.uk/guidance/how-to-evaluate-digital-outcomes-and-specialists-suppliers>

6 <http://oss-watch.ac.uk/apps/openness/>

7 <https://www.gov.uk/service-manual/making-software/open-standards-and-licensing.html>

8 [https://joinup.ec.europa.eu/community/eupl/og\\_page/licence-wizard](https://joinup.ec.europa.eu/community/eupl/og_page/licence-wizard)

9 <https://gds.blog.gov.uk/2014/10/08/when-is-it-ok-not-to-open-all-source-code/>

10 <http://apperta.org>

11 <http://code4health.org>

## References & links

Examples of Open Source usage across the public sector include; much of the gov.uk website, NHS Spine 2 (supporting 300,000 users, 35% of NHS Organisations), 25% of UK schools using Linux on at least one device and Open Source programming practised as part of the National Curriculum.

John Jackson, CIO of **Camden Borough Council**, states Open Source is “a key part of our approach to transformation”<sup>12</sup>.

**Shropshire Council’s** Project WIP describe Open Source as saving the council hundreds of thousands<sup>13</sup>.

**Apperta** have supported over 30 specialist communities through the Code4Health programme and by-products of their investments include the creation of a free and re-usable gov.uk style in bootstrap<sup>14</sup>.

**Taunton and Somerset NHS Foundation Trust, St Helens and Knowsley Teaching Hospitals NHS Trust and Blackpool Teaching Hospitals NHS Foundation Trust** formed a community interest company with vendor IMS Maxims to guide the development of an Open Source electronic patient record system for the NHS. Steven Bloor, the trust’s Chief Information Officer, said he expects the Open Source approach to “cost at least 60% less than a traditional proprietary route”.

In February 2016 Lee Hawksworth was introduced to head up **HMRC’s** Software Developer Collaboration with the overarching goal of “open, honest, respectful and innovative close working collaboration between the software developer community and HMRC to produce and operate great digital tax products for individuals, businesses and their agents so they can quickly and easily comply with their tax obligations.

### Commercial and professional services

Many of the Open Source projects provide routes and signposting to commercial professional services. OpenUK, the UK Open Source Industry Association, represents professional UK Open Source providers and the sponsors on the following page provide Open Source services and solutions.

### Contacts & resources

There are a variety of resources providing advice, support and solutions from the public and private sectors, commercial and non-commercial organisations.

#### Public Sector

- GDS Government Service Design Manual: <https://www.gov.uk/service-manual/making-software/open-source.html>
- LGA Digital Experts programme - Local Government Association 020 7664 3000
- LocalGov Digital - The network for digital practitioners in local government <http://localgovdigital.info/>
- European Commission reusable software information exchange and Open Source Observatory <http://osor.eu/>

#### Community

- OpenUK (formerly the Open Source Consortium) - The UK Open Source Industry Association <http://openuk.uk>
- Open Forum Europe (OFE) - Creating a level playing field for ICT suppliers <http://openforumeurope.org/>
- Open Source Initiative (OSI) - Promoting and protecting open source <https://opensource.org/>
- Free Software Foundation Europe (FSFE) - Free Software Foundation Europe is a charity that empowers users to control technology <https://fsfe.org>
- FlossUK - The open systems user group <https://flossuk.org/>

<sup>12</sup> <http://www.computing.co.uk/ctg/analysis/2352789/open-source-in-local-government-and-other-unicorns>

<sup>13</sup> <http://shropshire.gov.uk/projectwip/2011/08/204269-08-%E2%80%93-an-open-source-update/>

<sup>14</sup> <http://govstrap.io>

## Sponsors

We thank the following organisations for supporting the print and distribution of this publication.



Professional Open Source  
business management specialists  
<http://opusvl.com>



Award winning open source  
software consultancy  
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Independent document  
management experts  
[www.brambleknowledge.co.uk](http://www.brambleknowledge.co.uk)



Scalable & affordable Open  
Source solutions  
[www.omnis-systems.com](http://www.omnis-systems.com)



Powerful collaboration and  
communication suite  
<https://kolab.org>



The world's leading provider of  
open source enterprise I.T.  
[www.redhat.com](http://www.redhat.com)



The NHS Open Source  
foundation  
[www.apperta.org](http://www.apperta.org)



The home of LibreOffice  
[www.libreoffice.org](http://www.libreoffice.org)



Building and supporting  
open source search and data  
classification solutions  
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# Policy and guidance extracts

## UK Government IT Strategy

Formally the Government IT Strategy says the following about open source: Where appropriate, government will procure open source solutions. When used in conjunction with compulsory open standards, open source presents significant opportunities for the design and delivery of interoperable solutions. Government Service Design Manual <https://www.gov.uk/service-manual/making-software/open-source.html>

## Open Source, Open Standards and Re-use: Government Action Plan

"Often, Open Source is best – in our web services, in the NHS and in other vital public services. But we need to increase the pace and drive the principles of open source open standards and reuse through all ICT enabled public services" Angela Smith Minister of State for the Cabinet Office [www.cabinetoffice.gov.uk/sites/default/files/resources/open\\_source.pdf](http://www.cabinetoffice.gov.uk/sites/default/files/resources/open_source.pdf)

## LGA Digital Experts Programme - Evaluation

Recommendation to maintain a dialogue with supplier representatives and government around topics such as system integration, security and open source application development. <http://www.local.gov.uk/documents/10180/7632544/L16-98%2BThe%2BDigital%2BExperts%2BProgramme-03.pdf>

## Reuse through Open Data

"On data.gov.uk we have record numbers of datasets for citizens and businesses to re-use, boosting the UK economy and driving positive disruption in fields such as transport, financial services and retail". Matt Hancock Minister for Cabinet Office April 2016 <https://www.gov.uk/government/speeches/geoplace-conference-matt-hancock-speech>

## Creation of Open Source is required to comply with the Digital By Default Service Standard

Make all new source code open and reusable, and publish it under appropriate licences (or provide a convincing explanation as to why this cannot be done for specific subsets of the source code). Digital by Default Service Standard Point 8: <https://www.gov.uk/service-manual/digital-by-default>

## Guidelines for the approval of technology spending

Ensure a level-playing field for open source software when you choose technology. Demonstrate an active and fair consideration of using open source software – taking account of the total lifetime cost of ownership of the solution, including exit and transition costs. Use open standards, complying with any that are compulsory for use in government, unless you've been granted an exemption. GDS Technology code of practice <https://www.gov.uk/service-manual/technology/code-of-practice.html>

## The Digital Powerhouse

Key recommendation - "Encourage the use of open source software. Partners in the North should champion the use of open source software to enable collaborative innovation, opening software markets up to more local competition" <http://www.travelspirit.io/wp-content/uploads/2016/05/The-Digital-Powerhouse.pdf>

## Procurement Policy Note

Action Note 3/11 31 January 2011 – Use of Open Standards when specifying ICT requirements. "When purchasing software, ICT infrastructure, ICT security and other ICT goods and services, Cabinet Office recommends that Government departments should wherever possible deploy open standards in their procurement specifications".

## Highways Agency Enterprise Architecture (EA) Principles V2.1 January 2016

General principle 2: Reuse before buy, before build - Funding of programmes and projects will need to cater for cross project delivery (shared services) to avoid unnecessary duplication of ICT services (silos). [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/491871/EA-Principles-v2.1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/491871/EA-Principles-v2.1.pdf)