How Open Can Europe Get?

A White Paper by OpenForum Europe on the Contribution that Open Source Software can make to Interoperability across Europe

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OpenForum Europe was set up to accelerate, broaden and strengthen the use of OSS including Linux, within business - importantly within the context of open verifiable standards. 'Not for profit' and independent it draws its membership from both the supply and user communities. OpenForum Europe acknowledges all the input received from its members and partners in the compilation of this document. However, it does not seek to represent the OSS developer community nor present its opinions as being unanimously supported by its full membership.

www.openforumeurope.org

Winkworth House, 83 St. Judes Road, Englefield Green. Surrey. TW20 0DF. UK
Tel: +44 1784 473005 Email: info@openforumeurope.org

1. Introduction

Arguably the whole essence of the European Union is to maximise the effectiveness of the citizen and business, maximising the opportunity of operating in a cohesive environment. The integration issues of Europe present a vastly more complex challenge than in North America in view of the number of different cultures, languages and business practices involved. Verifiable Open Standards and Open Source Software provide a unique opportunity for the newly enlarged Europe Union to achieve full integration without being locked into an IT monoculture. We talk of common processes, eGovernment, and a variety of programmes that at their basic are fundamentally there to promote interoperability. This is a phrase that the ICT sector has seized on for many years to promote independence, avoidance of proprietary lock in, and maximisation of market competitiveness. But it is only recently that the potential pitfalls have been fully recognised. These have largely been as a result of limited competition, caused by dominance in the market by a single highly successful supplier. So what can Europe do? What do we actually mean by Interoperability in the real world? This White Paper presents the issue of Interoperability in the context of Open Source Software, against a background of the needs of the individual and community.

If Open Source Software development could be viewed as a 'meritocracy' and Proprietary Software development as an 'autocracy', then, our proposition is that Open Source Software is a catalyst to bring 'democracy' to development and deployment of interoperability in eGovernment and eBusiness.

2. A User Led Definition

The IDA programme of the EC (note1) has just published a very timely Working Paper on "Linking up Europe: the Importance of Interoperability for eGovernment Services", which has drawn out some key conclusions, but also some vital pointers to success. We selectively quote, " Interoperability is not simply a technical issue…… it goes beyond this to include the sharing of information…. and the reorganisation of administrative processes to support the seamless delivery….". It does not stop at national or administrative boundaries, linking together organisations, administrations, enterprises or citizens. To be effective it has to cover the three aspects of,
Technical interoperability – definition of open interfaces, protocols etc
Semantic interoperability – meaning of exchanged information
Organisational interoperability – aligning business processes, information architectures

A good analysis that recognises the role of the individual as well as the process and infrastructure.

Technical aspects of interoperability are undoubtedly essential, but as the IDA document points out, they are not sufficient to achieve the interoperability which users are increasingly demanding in an increasingly knowledge dependent society. Given the rapid advance of technology and users' expectations, it is essential that policy makers avoid defining interoperability solely in technical terms.

Ultimately, interoperability should be defined from the user's perspective.

"Interoperability" is the fulfillment of users' expectations to exchange and use information among various devices and software products from multiple vendors or service. Technical barriers to interoperability should only be those resulting from limitations in technology. They should not be intentionally introduced or sustained by vendors or service providers except in cases of and solely when used for overriding and legitimate interests. In these cases, the commercial or security rationale for the existence of barriers to access should be evident to

the average user and should not appear as intentional barriers to technical interoperability for the purpose of promoting market advantage for a single vendor.

3. The Need for “Openness”

There is a general consensus in governments around the world that “Open" is both important and good. There are also a great many people worrying about what open means and debating the issue vigourously. “Open” is very important, in fact critical, to government. The definition of “Open” is also a potentially critical dynamic in the competitive landscape of the information and communications technology (ICT) industry. There are as a result, many points of views, and many definitions. So how we come to terms with what is open and how can it be leveraged to support dynamic, responsive, and cost effective government?

Governments must be “open” to their citizens, giving greater access to e-government applications and enhanced responsiveness when citizens and businesses need to interact with government. “Open” here implies that public administrations allow access to e-government applications on a choice of platforms and with a variety of technologies so as to not to impose a single platform or vendor’s offering on the general public.

Information systems are essential to help governments deal with the fundamental development of their economies as well as the complexity of economic and social globalization of economies, unanticipated threats, citizen demands and fiscal constraints. Governments need considerable flexibility in the way that they configure their information systems. They need to have those systems seamlessly communicate with other systems. They need to be able to reconfigure those systems easily. They need to have the flexibility to source technology from a variety of vendors and leverage innovative emerging technology. They need flexibility and the ability to move information around efficiently. This is where openness comes in. It is the enablement of this flexibility that “Openness” is all about.

Openness is simply a means to an end**.** It is essential that we do not lose sight of what the goal is. There are various goals of "Openness". They include:

- Ensuring flexibility
- Ensuring interoperability
- Avoiding monopolistic monocultures and vendor lock-in
- Avoiding imposing technology decisions on the community
- Creating a broad, vendor independent skills pool
- Increasing creativity
- Driving cost effectiveness
- Ensuring future access to information
- Ensuring a level playing field for competition
- Maximizing freedom of action

Technical and organisational interoperability in particular create an innovation friendly environment for business model innovation and functional/technical innovation that create real economic value. An open IT ecosystem is an essential part of an innovation friendly environment for the evolution of IT systems but, more importantly, business models too.

4. Open, Verifiable Standards

“*Open, verifiable standards*” form the first part of the opportunity from Openness. However, it is only too easy to be drawn into the world of the academic definition rather than the

pragmatism that is necessary for organisations to draw full benefit. The characteristics of openness when applied to standards are:

- Published without undue or unreasonable restriction, and
- Control by a not- for- profit industry organization with an open, well- defined process for evolution of the standard,
- Freely available for adoption by the industry without constraint,
- Implemented by offerings that are available in the market.

In this way proprietary developed standard may well satisfy such a pragmatic definition of openness provided it is then endorsed by a consortium or standards setting body.

Standards evolve and move through a maturing process driven by pragmatism, speed to market and efficiency. Examples that many people are familiar with include HTTP, HTML, WAP, TCP/IP, VoiceXML, XML, and SQL. They are typically built by software engineers from various IT/software companies who collaborate under the auspices of organizations such as W3C, OASIS, OMA, ISO, and IETF.

The pragmatic approach is illustrated by PDF, which despite being introduced by Adobe, is widely accepted by the industry as open (and indeed has been used for the publication of this white paper).

In contrast, "Proprietary" describes interfaces that are developed by and controlled by some company and have not been made freely available for adoption by the industry. Proprietary software uses non-public interfaces or formats. An interface is the means for one program to interact with another. When an interface is non-public, the owner of the proprietary interface controls the interface, including when and how the interface changes, and whether, how and who can adopt it.

Most major companies and governments have embraced the concept of "openness". They purchase ICT goods and services from a variety of vendors and expect the technologies to work together or to "interoperate". They wish to have the flexibility to deploy hardware and software from a variety of vendors in a specific way in order to address specific problems. They do not wish to be subjected to the priorities and schedules of any particular vendor or be obliged to use products and services from a single or restricted group of vendors for interoperable solutions. "Openness" provides them with a way to treat technology components as discrete modules that can be mixed and matched.

The common belief is that open ICT environments will maximise flexibility and consequently the ability of business and public administrations to respond to changing demands from citizens and customers. Environments built around open standards will allow business and public administrations to rapidly adopt technology innovations and to exploit technology cost reductions. Use of open standards will also provide a greater degree of vendor independence. Increasingly business and public administrations are using open source software as a means of accelerating the adoption of open standards which subsequently allows them to implement open computing.

So interoperability is now the common strand linking systems together, or is it? Well at the level of interworking of systems, and definition of common file formats, then yes it is, or at least the work is making substantial progress (as IDA reports). But ICT still has do more if we are to really allow the power of ICT to be fully exploited by the citizen, within business, across government, wherever in Europe you may be operating. Are we really in a position to

encourage innovation and the growth in new economies? Will the Accession States be able to integrate and maximise their business opportunity as a result?

The battle of "openness" is still being waged. For the most part businesses have embraced open standards as a means of ensuring degrees of flexibility and vendor independence. Many vendors have also embraced open standards, either because their role in the ecosystem as a provider of horizontal infrastructure or networking capability necessitates it, or because of their desire to participate in markets dominated by other players who use their market position to promote their proprietary interfaces. Some vendors have been successful in exploiting "network effects" and control over programming interfaces and document formats to protect their market positions. With the increasing momentum towards open standards and development of powerful alternative approaches such as XML, Web services, and J2EE, the ability to exploit proprietary interfaces for competitive advantage will likely diminish.

Another key aspect of Interoperability lies in secure intercommunication. A secure environment is not just about defining levels of encryption, nor just about rigorous business architecture. It has to encompass a whole range of policies, legal processes and operational guidelines. Ability to share information or process in a secure environment is as much about support, maintenance and ownership as it is about publication and access.

5. Open Source Software

Open Source Software forms the second half of the opportunity for Openness. It is often spoken about in the same light as Open Standards, and sometimes the terms are interchanged – a mistake!

Open, verifiable standards broadly cover the technical issues of interoperability, and should be enforced by every government for its own use. Failure to do so increase the danger of lock in to a single supplier, limits choice, and restricts competition.

Open Source Software (OSS) represents a new business model, arguably the most significant discontinuity in the ICT market since the Internet itself. And like all market discontinuities, some organisations will see it as an opportunity, others as a threat. OpenForum Europe takes a very hard business approach to it and enthusiastically believes it has the opportunity to be more effective, lower cost, provide more choice. But **not** to suggest that Government should mandate use of OSS in preference to commercial software. If the OSS model is so good then its advantages will be self evident. Governments should not forego the possibility to use commercial software when it is the superior response to the needs of public administrations. But there are two important caveat: commercial software purchased by public administrations should conform with widely recognised open standards for interoperability, and secondly there is a strong argument that an Open Source licence should be used as the default for Government funded R+D, in order to actively encourage the culture of sharing and maximising the return on public funds. Frequently the opportunity to create new user communities and therefore new service markets will outweigh any real opportunity to spin out creation or proprietary licenses options where more conventional exploitation paths may be considered.

"An open source license safeguards the rights of anyone, anywhere, for any purpose whatsoever, to use, copy, modify and distribute (sell or give away) the software and to have the source code that makes those things possible" **(note 2*)***

This ability to modify OSS code makes OSS particularly well suited for interoperability with hardware and software from numerous vendors.

Standards compliance is a natural and inevitable characteristic of community developed software. Implementing many OSS platforms implies open standards compliance. Implementing Linux or Apache for example implies the implementation of many of the most important internet standards. Strict standards adherence at the lower foundation layers allows permits considerable flexibility of configuration and of choice of application and vendor.

So OSS by practice, rather than by definition, immediately passes the test of ***technical interoperability***.

6. The Real Benefit for Interoperability from OSS

The interoperability offered by OSS lies **firstly** in the way the software can be developed, **secondl**y how it encourages sharing, and **thirdly** how it can be openly verified.

Technical aspects of interoperability are undoubtedly essential, but as the IDA document points out, they are not sufficient to achieve the interoperability which users are increasingly demanding in an increasingly knowledge dependent society. Given the rapid advance of technology and users' expectations, it is essential that policy makers avoid defining interoperability solely in technical terms, but should view it from the user's perspective.

It is the areas of ***semantic* and *organizational interoperability*** that the benefits from OSS can be easily differentiated from a proprietary approach.

Semantic interoperability deals with common definition and meaning of services, allowing information to be combined with other sources for some meaningful purpose. Semantic requirements are often catered for through Metadata and Data Model in the technology model.

Organisational interoperability making services available, findable by the user community, accessible and usable. Artifacts such as Life Event models, Business Episodes, Business Processes, Organisational Structures support Organisational Interoperability.

Rather that support each facet independently, we prefer to establish the support and impact of Open Source on the underlying principles that support interoperability. These are the principles identified in the IDA Interoperability Framework which in addition to Open Standards, Security and Privacy, are Accessibility, Multilingualism, and Multi-lateralism, plus common vendor independent skills.

Accessibility

> There is a need to ensure that eGovernment is aimed at creating equal opportunities for all towards open, inclusive electronic services publicly accessible without discrimination
>
> The World Bank commissioned a report, [note 3] Open Source Software - Perspectives for Development which noted the "Opportunity for local capacity development" and highlighted many cases where OSS has been used to gain access to a level of IT infrastructure not affordable through the proprietary route.
>
> Not only can OSS be good for the tax payer financially, but it is excellent for maximising effectiveness and encouraging innovation. We already have many examples across Europe of the interoperability advantages from OSS allowing greater inclusion from the community. The well documented successes in the Extremadura region of Spain, where via a programme of "Application of technological innovation for the promotion of freedom and equal opportunities" they have achieved dramatic

success in accessibility for all, and in the stimulation of technological literacy. Based on OSS throughout they clearly developed an open culture and in the process made projected savings of 30 million Euros versus a proprietary alternative.

Aspect of the Principle		**OSS perspective**
Open and inclusive		By definition, the modus operandi of all OSS projects is to be ➓Open – can mostly be subscribed to through open access mailing lists and Sourceforge like project repositories ➓Inclusive – contributions accepted from all willing players – contributions of source code, of course, but also administrative support, documentation, language files, localisation support
Publicly accessible		Although examples cited by the World Bank from Tajikistan, Goa, Laos and Sao Paulo may seem a little extreme, they do make the point that OSS applications and technologies can enable the cash limited pubic administrations. This can very obviously be the case for an Irish Hospital, a Spanish Local Authority or a Polish school system.
Without discrimination		Again, from the OSS movement and as protected under it's many legal documents and licenses which take great care to be non-discriminatory.
Standards		Support for accessibility standards such as WAI, the Web Accessibility Initiative and Section 508 Accessibility Guidelines is widespread and most prominent projects such as Gnome, OpenOffice.org. Plone, Mozilla, PHPNuke have very active volunteers and initiatives to ensure compliance.

Multilingualism

In Europe, a vast variety of languages are used extensively in services today.

An interesting aspect of many OSS projects is strength of the Multilingualism driven by the ease of participation in project development, particularly in creation of PO and POT files.

Plone, a leading OSS Content Management System based on Zope, is available, "out of the box", in 15 languages and even has multilingual sites in Arabic, Chinese and Japanese (2 byte and right to left Unicode).

OpenOffice.org has released a new package for Multilingual word processing, the Tajikistan project converted KDE to Tadjik

Operation Cross Boundaries

The most visible benefit, however, is the ability to share applications across boundaries. The OSS licence not only creates a legal capability to share along with a potentially massive financial advantage, but importantly it creates a cultural environment for cooperation and *organizational interoperability*. This is undoubtedly why governments throughout Europe (the UK, France, Germany, Italy, Denmark, Spain and the Netherlands are but a few of the examples) are increasingly turning to OSS as an integral portion of their plans to ensure interoperability among e-government applications.

Common Vendor Independent Skills.

The net overall effect of the universal adoption of transparent Open Standards by both users and suppliers will be the creation of a pool of vendor independent skills. This will broaden general creativity in both user and supplier communities and lower the barriers to competition. It will significantly reduce supplier 'lock-in'. It will also tend to reduce supplier development and support costs. Strict adherence to transparent open interoperability by suppliers both of proprietary and open source products and services will enable the user community to acquire rapidly a common set of generic supplier independent skills. It is vital that training and education programmes should be based on vendor independent material and testing programmes, such as provided by the Linux Professional Institute and not on a default option of monoculture products.

7. Conclusions

- **Technical aspects of interoperability are undoubtedly essential, but as the IDA document points out, they are not sufficient to achieve the interoperability which users are increasingly demanding in an increasingly knowledge dependent society. Given the rapid advance of technology and users' expectations, it is essential that policy makers avoid defining interoperability solely in technical terms. Ultimately, interoperability should be defined from the user's perspective.**

- **Interoperability is aligned with "Openness" which in itself is the driver of the greater flexibility, access and responsiveness between government and the community. A pragmatic definition to the definition of "Open Verifiable Standards" provides the primary route to conformance.**

- **Open, verifiable standards broadly cover the technical issues of interoperability, and should be enforced by every government for its own use. Failure to do so increase the danger of lock in to a single supplier, limits choice, and restricts competition.**

- **Open Source Software (OSS) represents a new business model, arguably the most significant discontinuity in the ICT market since the internet itself. OpenForum Europe takes a very hard business approach to it and enthusiastically believes it has the opportunity to be more effective, lower cost, provide more choice.**

- **OSS by practice, rather than by definition, immediately passes the test of *technical interoperability*. It is the areas of *semantic* and *organizational interoperability* that the benefits from OSS can be easily differentiated from a proprietary approach.**

- **A broad pool of interoperable skills is essential for the implementation of fully effective semantic and organisational capability.**

- **OSS actively supports the areas of greater inclusion and accessibility, multilingualism, and operation cross boundaries in a way simply without comparison.**

- **The interoperability offered by OSS lies firstly in the way the software can be developed, secondly how it encourages sharing, and thirdly how it can be openly verified.**

Notes

1. IDA Interchange of Data between administrations www.europa.eu.int/ISPO/ida

2. Larry Rosen, General Counsel, Open Source Initiative www.opensource.org

3. Open Source Software – Perspectives for Development by Paul Dravis and InfoDev www.infodev.org/symp2003/publications/ OpenSourceSoftware.pdf