

How to work with the public sector: a short guide for FLOSS developers

Report for IDABC/Open Source Observatory

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How to work with the public sector: a short guide for FLOSS developers

1. Executive summary

When Free/Libre/Open Source Software (FLOSS) and government are mentioned in the same context, it is usually in relation to public sector *use* of software. Sometimes, it is related to public sector policies for the promotion of FLOSS. But there are also an increasing number of projects producing customised software for public administrations. This report looks into why FLOSS developers should collaborate with the public sector, and suggests how they should do this.

Government accounts for 13% of all ICT spending in Europe (€87 billion in 2004). This includes purchases by public administrations only. If health, education and other organisations that often form part of the public sector, especially in Europe, are included, the share of public funds in ICT spending is quite large. Public sector spending is also disproportionately influential, especially for new technologies, due to its high visibility.

This report informs developers why the public sector matters for FLOSS; how it works as a user of FLOSS; how it works as a policy maker; and how it directly supports FLOSS development. The next section explains the reasoning behind what often appears to be unreasonable bureaucracy forming barriers to interaction between FLOSS developers and the public sector: administrative procedures and procurement processes. This is followed by brief explanations of the legal concerns often found in public sector organisations and their means of providing financial support.

Once FLOSS developers are convinced about the need to engage with the public sector, and willing to understand their constraints, they have to understand the special needs of the public sector. These include particular application domains, the importance of interoperability, types of service and arrangements for support, and finally the public sector's potential community participation. These are explained in section 4.

Finally, the concluding section provides a short step-by-step guide for FLOSS developers on how to successfully work with the public sector.

2. The role of the public sector in FLOSS development

When FLOSS and government are mentioned in the same context, it is usually in relation to public sector *use* of software. Sometimes, it is related to public sector policies for

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the promotion of FLOSS. A question that is widely been neglected so far is why FLOSS developers should collaborate with the public sector, and how they should do this. First, developers need to know why the public sector matters for FLOSS; how it works as a user of FLOSS; how it works as a policy maker; and how it directly supports FLOSS development.

2.1. Why the public sector matters for FLOSS

Government accounts for 13% of all ICT spending in Europe (€87 billion in 2004). This includes purchases by public administrations only. If health, education and other organisations that often form part of the public sector, especially in Europe, are included, the share of public funds in ICT spending is quite large.

Public sector spending is also disproportionately influential, especially for new technologies. Although sometimes associated with wasteful expenditure on large projects that never work, the public sector is at the same time regarded as being fairly conservative when it comes to the use of new technologies. Thus, if governments start using, developing or otherwise seriously treating FLOSS applications, the message that goes out to the market at large is that FLOSS applications are safe and ready to be widely deployed.

Participants in the FLOSS community often note that the development of FLOSS is not only a professional and/or economic activity, but can be associated with further technological, social and political objectives regarding the production and exchange of information. The political activities of the FLOSS community have included interacting with policy makers and attempting to influence legislation and public strategies regarding FLOSS. Collaboration on a more practical level may be even more effective.

Three factors make the public sector a useful collaboration partner for FLOSS developers:

1. Although FLOSS is already widely used in the public sector (Ghosh & Glott 2005a) there is strong and even increasing demand for more FLOSS. However, the lack of FLOSS tools in niche application areas of public sector interest provides barriers to government adoption as well as opportunities for developers.
2. There is a strong need for collaboration among government organisations, to avoid the enormous duplication of effort that goes on in the purchase and development of software. FLOSS developers provide an excellent model for successful collaborative

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development of software, and mutually beneficial relationships can form between FLOSS and government communities. This is discussed further in Chapter 4.1.

3. The public sector is strongly aligned with policy-making and policy makers. As FLOSS developers are interested in promoting and multiplying the use of FLOSS products and services as well as their political and social aims, working with the public sector to actually develop FLOSS products is one way of providing inputs into the public policy process.
4. Despite the use of FLOSS in government, there are still strong prejudices against FLOSS based largely on ignorance, posing a challenge for FLOSS developers to counter these attitudes.

The interplay of these three factors suggests that collaborating with public sector institutions on a very practical level will have an effect beyond individual projects.

2.2. Public sector as a user

At least in Europe, the share of public sector organisations using FLOSS is higher than the corresponding share of FLOSS users in the private sector (Wichmann 2002, 17). FLOSS is already widely used in the public sector, but this use is neither systematic nor extensive within most individual organisations. That is to say, most governments have some use of FLOSS but few use it extensively. Almost four fifths of the 955 European local governments that were covered by the FLOSSPOLs local government survey use FLOSS. But 40% of these users have partial installations of FLOSS on servers and under 3% have FLOSS on all servers or all desktops. Furthermore, this use is largely limited to a few applications.

Survey results show that about a third of governments using FLOSS applications are unaware of using it – they say they don't use Open Source or Free Software, but go on to say that they use Apache, say, or Firefox. But even among the aware FLOSS users there is ignorance of how FLOSS works, leading to prejudices against it and fears about using it. Such organisations deploy FLOSS it for various reasons (such as budgetary pressures, or the need for customisation or interoperability), and increasing awareness of FLOSS reduces resistance to using it.

Most government use focuses on products, not on the community and its potential to provide development and support services. As a result, few interact with the community or

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see opportunities to contribute their software under FLOSS terms.¹ There is a discrepancy between the role public organisations play as users and their role as producers of FLOSS. While FLOSS use in Europe is higher in the public sector than in the private sector, FLOSS production seems to be dominated by individual developers and private sector companies. Since increased experience and interest as a user appears aligned with increased contributions to FLOSS development,² we assume that there is a great potential for FLOSS developers to support the public sector in the transition from a FLOSS consumer into a FLOSS producer, i.e. becoming an part of the FLOSS community.

2.3. Public sector as policy maker

It is a government's obligation to work in the interest of increasing the welfare of its citizens. Applied to software for government services, this requires cost-efficiency, independence (from vendors), security, and transparency (of the services, the data processing, and decision-making) as the four most important goals. Since the software market is still widely dominated by proprietary software and closed standards it may be that these goals cannot be achieved without policies to support them. As a policy maker the public sector has the capacity as well as the power to establish open standards as a principle requirement for software that is used for eGovernment. FLOSS provides for open standards and community-based support infrastructures and therefore it can provide a powerful means for the public sector to achieve policy objectives.

Many European governments, such as Spain, Germany, the Netherlands, Switzerland and Austria have adopted Open Source policy papers or guidelines. In European level the promotion of FLOSS is found in many high level policy papers such as in the eEurope action plan and the i2010 initiative.

¹ As the OSOSS 1-meting survey (Ghosh & Glott, 2005b) showed, 7 per cent of Dutch public organisations contributed to FLOSS projects and 12 per cent owned software that they considered sharing under the terms of a FLOSS license.

² This hypothesis is based on findings of the FLOSSPOLs developer survey, in particular our analysis of persons who join the FLOSS developer community without previous software development experience. Their initial contributions to the community are characterised by political or supportive activities. Over time and with growing experience however they get more involved into software development projects.

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2.4. Public sector supported FLOSS projects

A number of FLOSS projects have benefited from government support. In Europe, some of the better known recent cases include:

1. EU research funded projects: EuropePKI (a FLOSS public key infrastructure implementation); Agnula (an audio processing suite for GNU/Linux); and most interestingly, PyPy (an extension to the FLOSS programming language Python) where EU funds are used to organise sprints³ and fund individual independent developers.
2. The French government supported the development of the portal management system Agora based on the FLOSS content management system SPIP.
3. The German Federal Information Security Institute (BSI) funded the development of FLOSS authentication system software (Sphinx/Aegypten) and collaborative workspace tools (Kolab).
4. The regional government of Extremadura, Spain, supported several FLOSS projects in its sponsorship of the GNU/LinEx project, a localised version of Debian.

Some of these (and other, similar) cases were initiated by government bodies, others by members of the developer community, still others by companies interested in FLOSS development. Several million euro have been spent on FLOSS development support by governments, though most does not support the FLOSS development model as much as traditional software development with the final output released under a FLOSS licence.

It is clear that the public sector is not only a large user of FLOSS and a maker of policies that could affect FLOSS, but a source of funding and other support for FLOSS development.

3. Engaging with the public sector: difficulties faced by FLOSS developers

The previous section provided reasons for why FLOSS developers should consider collaborating with the public sector. This is by no means easy, and the following sections

³ A Python tradition, where developers gather a single physical location for a few days of intensive development.

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explain the reasoning behind what often appears to be unreasonable bureaucracy: administrative procedures and procurement processes. This is followed by brief explanations of the legal concerns often found in public sector organisations (governments in particular) and their means of providing financial support.

3.1. Procedures, and why they are needed

FLOSS developers immediately associate government with bureaucracy and complex procedures. While it is true that the public sector does seem to be more loaded with complex procedures than the private sector, and that this does lead to inefficiencies, they are there for a reason. The public sector is in principle subject to somewhat different considerations from the private sector, in particular it must be impartial, accountable, transparent and justify all spending. The principle of transparent, impartial and accountable decision-making and implementation does in practice lead to very complex and seemingly mindless procedures. But since the basic reasoning behind them won't change, while we can hope for simplified rules there will always be a need for procedures. Understanding this need, and comprehending and being willing to work with the procedures themselves is perhaps one of the early steps FLOSS community participants need to make if they want to work with the public sector – just as understanding the requirements and preferences of businesses is essential in order to work with large companies.

3.2. Procurement processes

One of the most important situations in which FLOSS developers may come against government bureaucracy is in public procurement. Procurement processes, calls for tender, are supposed to be competitive and even encourage the participation of small and medium-sized enterprises (SMEs). In practice, tender procedures for software services can be quite hard to navigate for organizations without a significant administrative infrastructure, let alone for individuals. As with the justification for procedures in general, these procurement processes are justified by the need for clear rules and all necessary information being made available in bid. This is supposed to ensure that the selection of a winning bid can be justified in the future solely on the basis of the material supplied during the bidding process. However, in practice public procurement tenders are often dominated by businesses that specialize in meeting the needs of the public sector – and thus invest in the skills necessary to navigate this process.

Furthermore, tenders often require evidence of financial sustainability, such as large turnover or a large capital base, which rules out smaller firms. This is to ensure that public

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funds are not wasted on firms that may go bankrupt, but such requirements almost never take into account the fact that the sustainability of a FLOSS-based solution is guaranteed beyond the lifetime of any individual firm. The Dutch government's new guidelines for public sector procurement of software published in 2005⁴ says that the availability of the source code itself could have a positive effect on sustainability, because future support is not dependent on the original supplier; as a consequence the weight of financial selection criteria could be lowered. As with most SMEs, the best way for FLOSS developers to meet the requirements of public procurement procedures is to team-up with other small or large partners, in order to be competitive. The alternative is to limit their activities to small tenders.

3.3. Legal concerns

Individual FLOSS developers tend not to be worried about the legal issues concerning their own software. Licences are chosen largely based on trust in a community using the licence, or in the licence steward (e.g. the Free Software Foundation for the GPL). Developers rarely have the resources to consider the full legal implications of their software contributions, and this is reasonable – even if they do face legal risks in theory, in practice risks faced by individuals or small firms are low.

Large firms have higher legal risks, so they worry more, and have the resources to do so. With the public sector, legal concerns are even more important – beyond the normal legal considerations of a business, they have to be sure they are not violating other rules and regulations concerning, say, public subsidies and competition, local language policy, liability issues, etc. In some jurisdictions (e.g. the US) a further complication is that the government cannot hold copyright, but this is not an issue in Europe.

Government lawyers are as a rule more conservative than company lawyers, since they are not supposed to waste tax payers' money in unnecessary law suits. Thus they prefer to use proven models and to stay in a context where they can exercise utmost control. Since most FLOSS licences are not written using legal terminology, in the appropriate language (e.g. the French government must have contracts only in French), or referring to the appropriate legal jurisdiction and framework, European government lawyers tend to prefer traditional European licence models.

⁴ www.ososs.nl, only available in Dutch

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There is not much FLOSS developers can do about this, but they need to understand that the way of addressing legal concerns that appears to pose obstacles to FLOSS is applied uniformly to *everything* government does, and exceptions to the process, culture and people are unlikely to be made for FLOSS. This means that the users and developers and proponents of FLOSS within the public sector should be seen as allies. That implies careful licence management in development projects – in order avoid litigation around licence problems. Proving that “it can be done” is crucial, for FLOSS developers as well as their public sector partners. For this, a basic understanding of licence issues is a prerequisite.

3.4. Financial support

As the FLOSSPOLS local government survey show, local governments spend on average about 20% of their total annual IT budget for software license fees. Theoretically, if FLOSS was widely implemented in public administration, this share of the IT budget could be used for financing training cost for administrators and users or for the employment of developers and/or consultants from the FLOSS community. In return the public administrations would get vendor independence and more long-term sustainability of their applications.

However, a peculiarity of public finances is the cyclical nature of budgets. Often, government IT departments (and others) are given an annual budget which they must spend, and cannot exceed, by the year’s end. After that there is a new budget. This often leads to a short-term perspective, making it difficult to adopt projects such as migrations, which may require a high initial cost but produce most financial benefits over a longer term. To overcome this constraint, solid financial cost-benefit analysis based on empirical evidence is needed to convince financial management in public bodies of the benefits of FLOSS. Here FLOSS developers can contribute with their project experience. There are, clearly, enormous opportunities available to FLOSS developers: Once financial management is convinced of cost savings in the long term, they are, after all, obliged by public sector norms to follow the cost-saving route.

4. Public sector needs

Apart from the organisational, financial and legal constraints, public administrations share also specific requirements in regard to their IT systems and applications. As in other contexts collaboration partners will have to get familiar with these needs and understand the requirements. These include particular the domains of application, the importance of

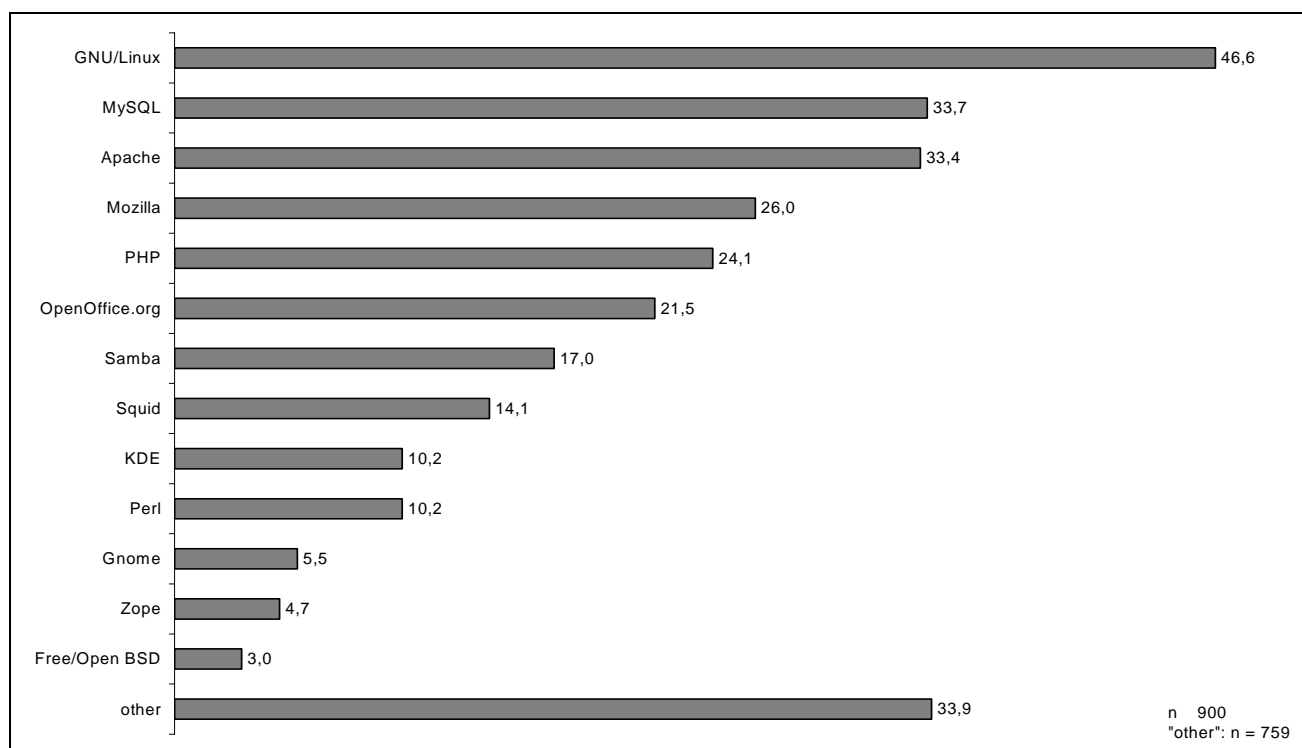
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interoperability, types of service and support expected, and finally the public sector's potential community participation.

4.1. Application areas

FLOSS usage by the public sector focuses on few application areas. As shown in Figure 1, the most popular software in public administrations is the GNU/Linux operating system, which is used (though perhaps on just a server or two) by almost half of the respondents to the FLOSSPOLs local government survey. Other important applications are the MySQL database system and the Apache web server, both used by more than one third of the respondents as well as OpenOffice. However, one third of the respondents reported using “other” FLOSS systems (i.e. not one of about 13 major applications listed), which suggests that there is a significant usage of niche applications.

Figure 1: FLOSS applications used by European governments (%)



Indeed, there is a large range of application areas that are government-related, of which only some are specific to governments with little use outside the public sector (see Table 1). While FLOSS developers may find the more specific application areas “boring”, they represent areas of opportunity for FLOSS since:

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- Existing providers are expensive either because they build custom applications from scratch for each client, or because there are a few dominant players in the market; this opens possibilities for others, such as FLOSS developers, to enter the market;
- Similar needs exist for a very large number of public sector organisations, allowing large-scale code reuse combined with local customisation that is a model easily used by FLOSS developers.

The IDABC Open Source Observatory's Software Inventory provides a detailed categorisation of the types of applications used by the public sector, as well as details of several existing FLOSS software packages in these domains.

Table 1: Types of applications used by the public sector

Very generic purpose	e.g. operating system, desktop environment, Office suite
Specialised purpose	e.g. content management, a collaborative work environment, a workflow system that could be used by various public bodies but also by firms and other users
Specific PA purpose	e.g. land record management, public health

4.2. Interoperability

Software buyers often try to achieve “vendor-independence”, which is to retain the ability to change software products or producers in future without loss of data or significant loss of functionality, e.g. through the use of open standards for interoperability. However, this can conflict with implicit or explicit criteria for software purchasing, in particular with the requirement that the new software must be compatible with previously purchased software. Buyers who give priority to the latter criterion instead of using a general requirement for open standards or vendor-independent interoperability remain locked in to software they previously purchased.

The FLOSSPOLs local government survey revealed that 59% of European local governments opt for interoperability and 33% for compatibility (8% said they did not know). Local governments that are aware they are using FLOSS tend much stronger towards interoperability than unaware FLOSS users or non-users. Given that the IT department of an organisation truly wants interoperability, and is aware of the conflict between interoperability and proprietary software applications, limitations to interoperability caused by proprietary software that are experienced will only increased the demand for more FLOSS in the organisation.

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This aspect provides a meaningful starting point for FLOSS developers to increase public sector institutions' awareness and knowledge of FLOSS. Since the desire to increase the share of FLOSS in a public sector institution grows with the perceived need for interoperability, this argument has the potential to increase the usage of FLOSS in the public sector. It also implies that FLOSS projects in public administration have to consider interoperability issues as a top priority.

4.3. Type of service and support

Only 28% of the FLOSSPOLs local government survey respondents think it would be an improvement to have access to the software source code, whereas 52% said they think it would not. 20% said they do not know whether access to the source code would be an improvement for their IT department. So it's clear that source code access is not the prime driver of FLOSS take-up in the public sector, though most other benefits stem from this feature. In particular, many respondents believe FLOSS is valuable because it is more customisable than proprietary software, which is a direct result of the availability of the source code – even if respondents did not always make this connection.

Public sector organisations may have a stronger interest in software modifications than in completely new software. However, government IT managers seem to think that they don't need source code access because they don't have the skills – or the time – to work with the code. FLOSS developers can point out that government users don't need to be able to work with the code themselves, as long as they have the ability to subcontract this to anyone of their choice. To reinforce this argument, FLOSS developers working with public administration must show that they will adhere to standards and provide good documentation.

Table 2 below classifies the types of service that governments might expect, and the types of support arrangements they could use. When development from scratch is expected, FLOSS developers, unlike proprietary developers, can suggest building upon or integrating existing solutions instead. Improvement of a solution developed by (or under contract for) the government organisation is also an area where FLOSS developers may have an advantage, if they can reasonably offer to provide a community of support. Since other government organisations may have similar needs, building communities of government users supported by FLOSS developers is certainly feasible.

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Table 2: Possible types of service and arrangements for support

Possible types of software development service required by the public sector	Development from scratch
	Improvement of a solution developed externally (e.g. with the purpose to reuse it, to adapt it to local needs, to reach a specific security certification or to integrate components into a specific distribution)
	Improvement, take over or support of a solution developed internally by the administration
Arrangements for support: Entities with which the public sector could possibly collaborate	“open source” or “free software” community without formal organisation or legal personality
	Organised community (e.g. non profit organisation of users or developers with legal personality)
	Commercial partner (a SME, larger company or a consortium, specialised in development or integration of software solutions)

4.4. Community participation

Indeed, building communities may be the most valuable skill FLOSS developers can contribute to the public sector. Most public sector institutions do not interact directly with the wider FLOSS community, which seems to be due to a lack of knowledge of the capacities that are provided through this community as well as insecurity about legal and organisational implications. Most public sector institutions do not even interact directly with *each other*, even when it comes to developing solutions for their often similar needs.⁵ Thus, a good part of FLOSS developers’ involvement with the public sector should focus on demonstrating the community’s potential for the development and maintenance of software for public bodies. Besides this, FLOSS developers could also help to encourage public sector institutions to publish software under the conditions of Open Source licenses.

Depending on which kind of development activities a public organisation pursues, the ways of interaction with the will differ considerably.⁶ FLOSS activities that settle around existing standard software will rely on and fit in the activities of the wider FLOSS

⁵ Although studies clearly show the benefits of sharing: “Pooling software” Schmitz, P-E. (2002): Pooling Open Source Software. Accessible online at <http://europa.eu.int/idabc/oso> (see Resources section)

⁶ This differentiation relates to ideal types of development strategies and community involvement. In reality we will probably find mixed strategies on a continuum of strategies ranging from in-house-

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community. In contrast, the development of niche applications probably relies much more on in-house activities of public organisations or on smaller specialised groups of FLOSS community members. This might require the participation of public organisations themselves in such specialised communities.

5. Starting and sustaining a collaboration: a step-by-step guide

The previous sections argued why FLOSS developers should engage with the public sector; why the public sector poses difficulties for FLOSS developers; and what the public sector's special needs are. This concluding section provides a short step-by-step guide for FLOSS developers on how to successfully work with the public sector.

5.1. Understand the market

Read the previous sections on the special features and requirements of the public sector, and get to know public sector organizations and the people who work in them better, in order to understand the market.

5.2. Pick a target

Identify an organization, or group of organizations, with whom you would like to work. Alternatively, identify an application domain of interest and organizations with needs in that domain.

5.3. Inform and convince public sector organizations about FLOSS

In parallel with understanding the public sector organisations, convince them by providing information. IT administrators in public sector institutions often know about FLOSS products, but not much about the organisation of FLOSS development and the FLOSS community.

Raise awareness and understanding of FLOSS processes. In contrast to the interaction within the FLOSS community, interaction with the public sector must take into account that there is no “natural” interest in FLOSS and that sometimes reluctance or disinterest must be overcome. Demonstrating the *practical power* of FLOSS and the community may be most

development / no community involvement on the one pole and total community-involvement / no in-house development on the other pole.

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useful, certainly for initial contacts, while awareness of its ethical and political aspects may be appreciated at a later stage.

The counterpart of this document, the *Guideline For Public Administrations On Partnering With Free Software Developers*⁷ may be a useful aid in instructing public administration contacts who are interested in working with FLOSS developers.

5.4. Find business partners

Depending on the type of service and support arrangement your target wants (described in section 4.3, Type of service and support), you may need to find partners. Working as a community may be possible, but almost always – and certainly if you want financial support – formal arrangements are required. This typically will involve a public procurement process, so you will need to find business partners with some experience in this process.

5.5. Get practical

Initial workshops and meetings should be followed by concrete practical projects that meet the specific requirements of a public sector institution. These projects can either be development projects (for new software) or maintenance projects (for existing software). As a general rule, FLOSS developers who take a role in this should secure that both, the quality of FLOSS products and the capacities of interacting with the FLOSS community, are experienced by the IT administrators and possibly also the users of FLOSS in this institution. FLOSS developers who succeed in demonstrating that specific needs of a public institution can be met by FLOSS and the FLOSS community will have a great effect on the overall attitudes towards FLOSS in the public sector.

5.6. Build community participation

Many public sector organisations do not have IT staff with the skills or time that is required for the interaction with the FLOSS community. But this interaction is useful to them, and also to the FLOSS community itself. FLOSS developers should take responsibility for connecting specific projects or institutions with the community. They will have to identify

⁷ Ghosh, R.A., Glott, R, Robles-Martinez, G. & Schmitz, P-E 2004. *Guideline For Public Administrations On Partnering With Free Software Developers*. European Commission DG ENTR. Available online at <http://europa.eu.int/idabc/servlets/Doc?id=19295>

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practical needs, initiate and coordinate interaction between the institution and the FLOSS community, organise developers to provide the requested software or service, and secure the process of implementing new software or services in the institution. The process of interaction encourages users to contribute and participate actively, and FLOSS developers can play a role in bringing users from different public organisations together to build a community of common interest. The more active public organisations become, the more they appreciate the benefits of FLOSS – and the more the FLOSS community gains from this interaction.