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Abbreviations

BSD	Berkeley Software Distribution	MMS	Multimedia Messaging Service
CMS	Content Management System	MOODLE	Modular Object – Oriented Dynamic Learning Environment
DNS	Domain Name System	MS	Microsoft
EDP	Electronic Data Processing	NFS	Network File System
EPA(s)	European Public Administration(s)	OCS	Open Source software inventory next generation
EUPL	European Union Public License	ODF	Open Document Format
FOSS	Free / Open Source Software	OGC	Open Geospatial Consortium
GIMP	GNU Image Manipulation Programs	OpenLDAP	Open source implementation of the Lightweight Directory Access Protocol
GIS	Geographic Information Systems	OS	Operating System
GLPI	Gestionnaire Libre de Parc Informatique/ Information resource manager	OSEPA	Open Source software usage by European Public Administrations
GNU	Gnu's Not Unix	OSS	Open Source Software
GPL	General Public License	OTRS	Open Source helpdesk and IT service management



GUI	Graphical User Interface	PC	Personal Computer
ICT	Information and Communication Technologies	PDF	Portable Document Format
IDABC	Interoperable Delivery of European eGovernment Services to public Administrations, Business and Citizens	SMS	Short Message Service
IT	Information Technology	TCO	Total Cost of Ownership
KDE	Key Desktop Environment	WFS	Web Feature Service
KEDKE	Central Union of municipalities and communities of Greece	WMS	Web Map Service
KVM	Kernel based Virtual Machine		
LGPL	Lesser General Public License		
LTSP	Linux Terminal Server Project		

Summary

This document is a Good Practice Guide on the various aspects of integrating free and open source software (FOSS) systems and applications in European Public Administrations (EPAs). The guide was developed on the basis of the experiences shared and the case studies collected by the consortium members of the OSEPA project that aims to assess the spread of FOSS usage by EPAs. 42 case studies on open source software usage by various organisations in different technical implementation fields (e.g. operating systems, office suites, databases, server, Geographic Information Systems) were reviewed, analysed and evaluated according to predefined evaluation criteria, score thresholds and ranking schemes. Following the methodology and definitions that were adopted, 34 out of 42 collected cases have been identified as good practices and are presented in this guide. Guidelines and recommendations that sum up the main conclusions and lessons learned arising from these cases are provided in three sections (management guidelines, technical guidelines and sustainability guidelines) covering the full cycle of a FOSS project (planning and preparation, implementation, support and continuation). Good practices highlighted and main lessons learned include: setting clear and measurable objectives, selecting technically mature FOSS solutions that fit specific organisations, choosing proper licensing models, preparing and involving the organisation's staff, estimating costs and risks, using open standards, taking into account source code modification and compatibility issues, keep evaluating and supporting FOSS solutions and reaching out to peers, central agencies and the open source community.

This is the 3rd, final version of the Good Practice Guide updated with new evidence and case studies through further experience exchange within the OSEPA consortium. The guide is intended to be used as a reference guide for tested, proven-effective FOSS solutions and practices by all interested parties and stakeholders in public administrations wishing to assess the feasibility or plan the implementation of a FOSS solution in their organisation.

1. What is this guide about? Introduction

1.1. Scope and use of the OSEPA Good Practice Guide.

The Good Practice Guide on FOSS usage by public administrations is based on the experiences of the OSEPA consortium and aims to:

- 1. highlight good practices on integrating FOSS solutions in public administrations*
- 2. provide guidelines, recommendations and lessons learned on various aspects of FOSS usage by public administrations based on good practice cases*
- 3. further promote the identification and exchange of good practices among stakeholders*

This document is intended to be used as a starting point or a reference guide for proven-effective, transferable FOSS solutions and practices by all members of the OSEPA consortium. It has been developed within sub-task 3.6.2 “Production of Good Practice Guide based on the experiences of the consortium” of Component 3 (“Exchange of experience”) in the OSEPA project.

The guide is also to be used by all interested parties and stakeholders in public administrations who are interested in:

- 1. assessing the feasibility of FOSS solutions in their organisation*
- 2. planning a migration to FOSS applications in their organisation*
- 3. adopting specific FOSS solutions in their organisations*
- 4. developing custom-built FOSS applications for their organisation*
- 5. partnering with software developers / external consultants in developing/adopting FOSS solutions for their organisation*

This is the 3rd version of the Good Practice Guide updated with new evidence and case studies through further experience exchange within the OSEPA consortium. Chapter 1 of this document introduces the context and background of developing the Good Practice Guide and presents the basic features of the methods used to evaluate case studies and highlight good practices. Chapter 2 provides guidelines, recommendations and lessons learned based on the collected case studies. The Annex includes a list and short description of all good practice case studies that have been identified in the context of the OSEPA project.

1.2. Good Practices in FOSS: terms and definitions.

The term “public administrations” refers to territorial organisations, such as ministries, municipalities, communes, provinces and prefectures, of non-territorial public institutions, for example universities, academic centres, schools and social security services and hospitals. For the purposes of this guide, the terms “public administrations” and “public organisations” have the same meaning and scope of use.

Free and/or open source software (FOSS) programs are programs whose licenses give users the freedom to run the program for any purpose, to study and modify the program, and to redistribute copies of either the original or modified program (without having to pay royalties to previous developers).

The term “open source software solution” is defined as a procedure, method or technique that has been adopted for the solution of a problem with the use of open source software tools, and that has shown at least some evidence of effectiveness. For the purposes of this catalogue, the terms “open source software solution” and “open source software practice” have the same meaning and scope of use.

FOSS practices cover a wide range of public organisation tasks and operations: document management, communication and networking, administrative workflow management, e-government services, tourist services and information portals, e-learning and education, IT system administration and security, taxes and finance, human resources management.

These needs are covered by a wealth of available FOSS solutions and applications: office suites, e-mail clients, project management applications, groupware, file sharing tools, network and communication utilities, administration systems, database management applications, graphics suites, Computer Aided Design (CAD) and Geographic Information Systems (GIS), data security and software development tools.

Practices (i.e. procedures, techniques or methodologies) that seem to work within organisations are further defined according to their proven level of effectiveness, wider implications and transferability. Some of the most frequent terms used to describe such practices are: *promising practices*, *demonstrated practices*, *replicated practices*, *lessons learned*, *best or good practices*.

Promising practices are programs and activities that have been used for certain periods of time within an organization and indicate, at an early stage, a potential of becoming widely applied long-term solutions. The effectiveness and transferability of promising practices however, is evaluated on a preliminary basis and not proven according to any result indicators.

“Lessons learned” is a category referring not only to tested, effective practices but also to “things no to do” or mistakes to be avoided in future implementations.

“Good”, “best” or “effective” practices are different terms used to refer to processes or methodologies that have proven to be effective in a specific context (e.g. organisational department, implementation field, geographic region) and show strong evidence that there might be also effective in different contexts (e.g. organisational settings, regions) and various cases.

In the context of the INTERREG IVC programme, a “good practice” is defined as “an initiative (e.g. methodologies, projects, processes and techniques) undertaken in one of the programme’s thematic priorities which has already proved successful and which has the potential to be transferred to a different geographic area. Proved successful is where the good practice has already provided tangible and measurable results in achieving a specific objective”.¹

A good practice is also defined in terms of having direct, demonstrable impact within different organisational or geographic settings, if transferred.

1.3. Background and methodology

1.3.1. Collecting practices

Case studies of FOSS practices implemented in various European public administrations were collected through the communication networks and available resources of the OSEPA project consortium. A purpose-developed online questionnaire was used for the reporting of the OSEPA practices.² The questionnaire consisted of the following thematic sections:

1. *Organisation profile*
2. *Description of the FOSS solution*
3. *Management issues*
4. *Technical issues*

¹ Page 2 of the Interreg IVC programme manual.

² As described in the “Report on the methodology and the tools for investigating partners' practices on FOSS usage” by the City of Schoten.

5. *Impact/ benefits/ results*

6. *Transferability issues*

Three stages of identifying FOSS practices were foreseen within the duration of the OSEPA project. In the 1st, 2nd and 3rd stage of case collection, 19, 15 and 9 cases were submitted respectively, between November 2010 and June 2012, resulting to the final catalogue of identified cases. Accordingly, the Good Practice Guide was updated with all new cases identified as best practices in each stage (see Figure 3).

1.3.2. Evaluating practices

42 submitted FOSS solutions that have been implemented in public administrations across Europe were investigated, analysed and evaluated according to the methodology defined within the OSEPA project partnership.³

FOSS practices were examined and evaluated within specific fields in order to assess their appropriateness as good practices and to classify them accordingly. These fields, set according to definitions and prerequisites of what should be considered a good practice, also taking into account the specificities and objectives of the OSEPA project were grouped as following:

³ As described in the “Planning report setting out the methodology and criteria with which partners’ practices will be examined and synthesized”, delivered by OSEPA partner CTI-Diophantus.

- 1. Solution impact on acknowledged problems.*
- 2. Achieved objectives and produced results.*
- 3. Previously applied evaluation.*
- 4. Problems encountered in implementation.*
- 5. Number of Involved staff and organisational departments.*
- 6. Source code modification.*
- 7. Use of own resources.*
- 8. Transferability.*

The evaluation of practices was applied in four indicative stages:

- 1. Reviewing of collected practices*
- 2. Evaluating practices through predefined criteria.*
- 3. Setting score levels for each practice*
according to defined weights and thresholds for each evaluation field.
- 4. Assigning practices to ranking groups / classification categories*

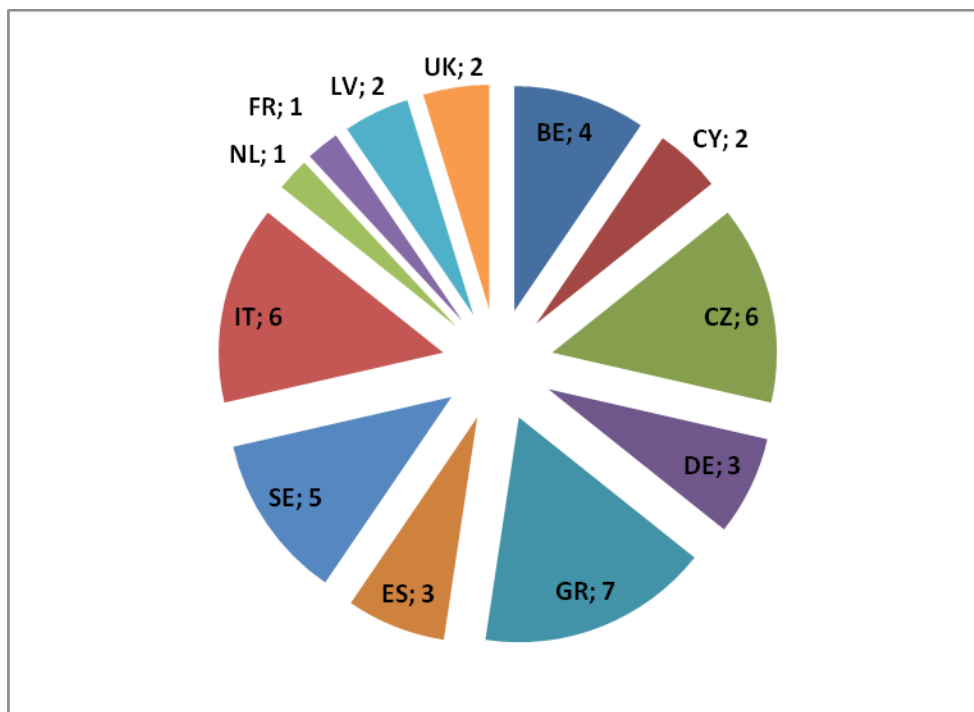
The evaluation criteria that were used to differentiate and rank FOSS practices were linked and structured as shown in the following table:

Table 1. FOSS Practices evaluation fields and criteria.

Evaluation fields	Evaluation Criteria	Objectives
Solution impact	Level of Solution impact	Assess whether an implemented practice addresses widely acknowledged issues and problems also shared by other organisations in different regions and settings
Achieved objectives and produced results	Type of achieved objectives and produced results	Identify the type and character (e.g. measurable, validated) of objectives achieved and results produced by a specific practice
Previously applied evaluation	Type and level of previously applied evaluation	Identify the type and level of any previous validation and evaluation (e.g. internal, external, preliminary, systematic)
Problems encountered in implementation	Extent of problems encountered in implementation	Assess the extent of encountered problems and difficulties that have hindered a practice's implementation
Involved individuals or organisational departments	Number of involved individuals or organisational departments.	Identify the extent and adoption scale of a practice within the organisation in which it has been implemented
Software development and customisation	Level of software development and customisation	Assess the level of software development or modification required by an implemented practice
Use of own resources	Extent of using own resources	Assess the level on which a practice has been implemented by in-house staff and resources or has been assigned to external associates
Transferability	Level of transferability	Assess a practice's potential or proven record of being transferred to different geographic contexts and organisational settings

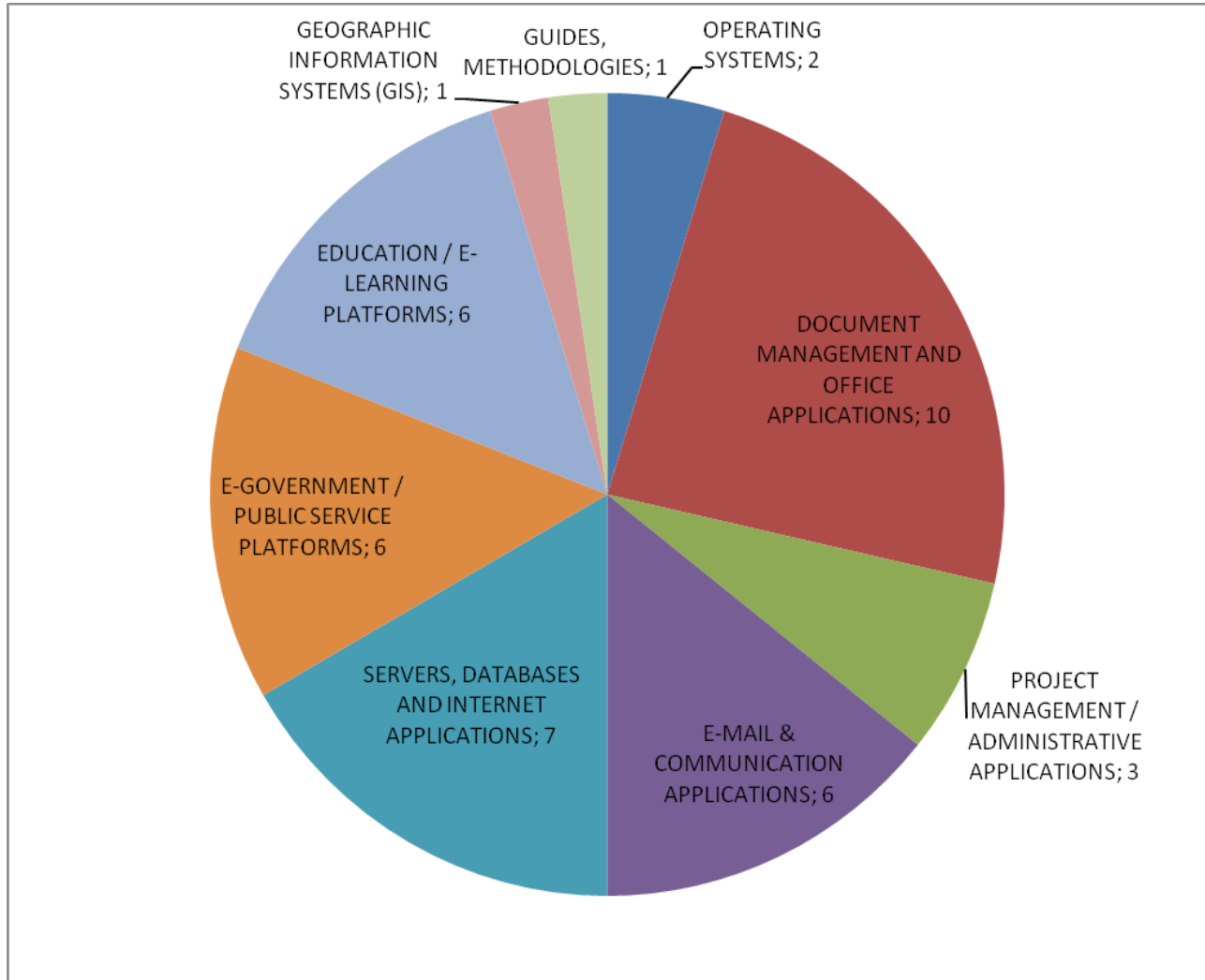
42 practices, implemented by 32 organisations in 12 European countries were reviewed and evaluated.

Figure 1. Geographic distribution of collected cases. Total cases: 42



Collected practices refer to various technical implementation fields, uses and types of applications as indicatively shown in Figure 2.

Figure 2. Identified cases by implementation area. Total cases: 42



Out of 42 case studies, 34 practices fulfilled all minimum requirements and were evaluated as “good” representing a rate of 81%. The selection of good practices was exclusively based on the

evidence collected through the OSEPA online questionnaire for the identification of open source practices and the resulting catalogue of case studies.⁴

Case studies that were not included in the list of good practices, were evaluated as non eligible on the basis of:

- *incomplete information provided by the organisation in certain fields or questionnaire sections*
or
- *irrelevance of implemented FOSS solution to public administrations and similar organizational profiles or*
or
- *low overall score or failure in one of the evaluation fields.*

Cases already identified in the previous stages of case collection, were re-submitted with additional or corrective information in order to be re-evaluated and included in the final version of the good practice guide.

Practices that were identified as good were listed according to technical implementation fields and categories of open source systems and applications.⁵ Categories of open source systems and applications were broadly defined according to the taxonomy used in IDABC publications⁶, also taking into account the categorisation applied in the practice identification questionnaire.

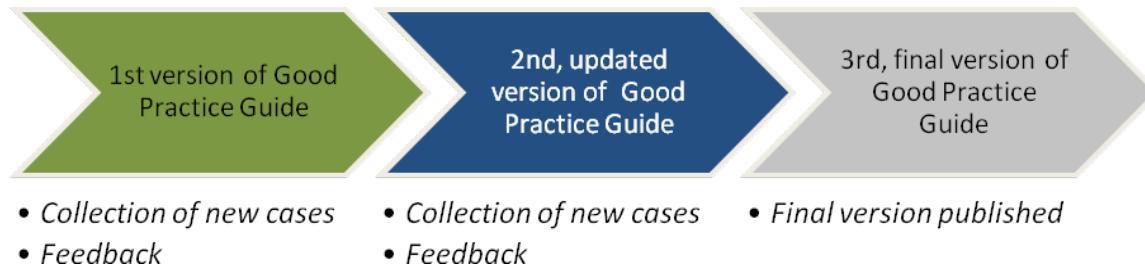
The updating of the Good Practice Guide was planned as indicated in Figure 3:

⁴ All 42 cases submitted by 30/06/2012 were reviewed.

⁵ See Annex.

⁶ The IDA Open Source Migration Guidelines, November 8, 2003. Accessible at: <http://ec.europa.eu/idabc/servlets/Doc5621.pdf?id=1983>

Figure 3. Updating process of the Good Practice Guide.



2. FOSS guidelines for public administrations: *good practices and lessons learned in the OSEPA project*

This section aims to highlight good practices, outline lessons learned and provide recommendations arising from the identified good practice cases collected through experience exchange in the OSEPA project. Various aspects and implementation cases of FOSS applications, tools and platforms, met in a wide range of public organisations are covered.

Practices and recommendations described in this section are not to be seen as a complete list of dos and don'ts or as practical guidelines providing a blueprint for implementation. They are intended, however, to be used as a starting point, or a reference guide for tested, proven-effective practices of integrating open source software solutions in public IT infrastructures as documented through shared, useful experiences of different public organisations across Europe.

As shown in most of the cases identified so far in the OSEPA project, previous experience, guidance and support on using FOSS for various tasks and issues in different technical implementation areas, public administration scales and settings are valuable in shaping firm IT strategies, managing transition and planning migration projects.

Under this premise, practices, lessons learned and recommendations included in this section sum up and were based on:

1. Gathered responses from public administrations to the OSEPA questionnaire for the identification of FOSS practices.
2. Best methods and strategies as identified in practices that showed high levels of effectiveness and transferability.
3. Identified risks and pitfalls to avoid, implementation problems and lessons learned of all collected practices.

Previous related EU guidelines and recommendations on the use and adoption of FOSS in the public sector were also taken into account.

Guidelines, critical issues and recommended actions, as described in this section, broadly refer to three main aspects that should be always considered when planning, implementing or maintaining FOSS solutions in a public organisation:

1. management guidelines:

Planning and funding, licensing, cost estimation, project monitoring and risk management, in-house implementation and external expertise, staff training.

2. technical guidelines:

Hardware requirements and software components, source code modification, software development and customization of applications, compatibility, open standards and interoperability, data safety and preservation

3. sustainability guidelines:

They also refer to the full life-cycle of planning, implementing and maintaining a FOSS solution within a public organisation:

1. Planning & preparation

2. Implementation

2.1. MANAGEMENT GUIDELINES

Solutions to common needs and problems are more likely to be shared.

The City of Freiburg set the objective of migrating from MS word 2003 to OpenOffice 3.21 in 2.000 client computers. Setting a measurable target was one of the key-factors of the project's success.

2.1.1. Addressing a shared problem

Addressing a problem that is also acknowledged by other organisations can significantly increase the rate of available know-how resources and support as shared problems often have shared solutions. As clearly shown in many identified cases, practices addressing an inter-regional or “universal” need referring to everyday tasks and activities (e.g. text processing and office applications) are more easily adopted and more likely to be transferred to other organisations.

2.1.2. Setting clear objectives and expected results

It has been proven that in many cases, while projects were successfully implemented, end-users were not overall satisfied partly because the project objectives were unclear or the expectations too high. In planning a FOSS

project, it is crucial to set certain objectives to be reached and measurable results to be achieved. In this way, the means and actions towards achieving objectives can be more specifically determined and the project's success can be directly validated. Moreover, high expectations leading to end-user dissatisfaction that could even risk the continuation of the implemented practice can be avoided.

2.1.3. Choosing a solution that best fits the organisation

When it comes to free and open source software tools and applications there are no one-size-fits-all solutions. There is a remarkable wealth of available software application resources in a wide range of technical implementation areas. In most occasions, there are several choices for a single task, whether administrative or non-administrative. Moreover, FOSS products offer the flexibility of custom-building of software components to meet the needs of any given organisation. Offered solutions should be carefully reviewed in the light of available human and technical resources, targeted end-users and overall organisational needs. Small or medium size organisations (e.g. Local Police of Brasschaat BE, Vindeln Municipality, SE) have significantly different needs and features compared to large organizations or national agencies and institutions (e.g. OSS Alliance, CZ, University of Cyprus, CY) that refer to thousands of end-users or stakeholders. Differences also occur in terms of organizational profiles (e.g. cities and municipalities, academic institutions, regional authorities, national agencies).

"OSS is just another set of tools with it's strengths and weaknesses. Every big move like migration to any solution (including OSS based) should be tested thoroughly to avoid any problems in production. If implemented right, OSS can relieve from big financial investments in short term, and give back control of IT to organisation in long term trough relative vendor neutrality".

*The State Social Insurance Agency,
Riga, LV*

2.1.4. Understanding how FOSS licensing works

Licensing is an important aspect of any open source software project in terms of providing the context in which software may be used, distributed or modified. This is particularly important for public administrations that either plan to implement projects requiring source code modification or even release their custom-built solution as a contribution to the open source community. Choosing a proper license (e.g. GNU General Public License, BSD licenses, Eclipse Public License) according to product, use and distribution strategies might prove to be a time-consuming process that should be taken into consideration by EPAs. EUPL (European Union Public License) license provides a valid, legal tool in which to distribute software and it has been selected by various successful projects that are included in this guide.

2.1.5. Assessing organisational strengths and limitations

*EUPL
(European
Union Public
License) license
provides a valid,
legal tool in
which to
distribute
software to be
used by many
other providers
including public
administrations*

Defining organisational strengths and limitations is crucial in determining the right strategy for implementing a FOSS solution, either by using own resources or asking for the support of external consultants. Public administrations with in-house technical staff that is skilled enough to develop manage and support a FOSS solution on a day-by-day basis may opt for internal implementation seeking independence from vendors and external consultants. In order to mitigate possible risks, however, internal skills and capacities should not be overestimated, limitations of available resources should be carefully considered and external support should be asked, if needed. This is particularly the case for FOSS solutions that require a high level of technical expertise in software development, source code modification and infrastructure

A balanced strategy, involving both in-house implementation and external expertise, where needed, seems to be effective.

maintenance. Avoiding, where

“if you have in-house knowledge, you probably will achieve your goals with very little expenses comparing to commercial products”.

Valmiera City Council, LV

possible, technically demanding and over-complicated projects may potentially reduce reliance on external consultants. In any case, public administrations should carefully assess task complexity, internal capacity and vendors providing support for FOSS products and application suites. As shown in many good practice cases, a balanced strategy, involving both in-house implementation and external expertise, where needed, seemed to be more effective.

2.1.6. Estimating and validating costs

“The migration project to OpenOffice ... helped to save almost half a million Euros of licence fees. The total implementation costs are estimated between 50.000 and 100.000 €”.
The City of Freiburg, DE

Cost reduction, particularly referring to software procurement cost, is among the main motives for a transition to open source software. Applying FOSS

The use of FOSS (Open Office) allowed the City of Modena (IT) to save about 800.000 € per year. Total implementation costs are estimated between 100.000 and 500.000 €.

does not necessarily mean however, as often perceived, entirely cost-free solutions. Implementing FOSS solutions implies various types of costs that should be carefully analysed and estimated prior to implementation: staff training costs, technical support fees, management/administrative costs, external consultant fees etc. Providing an indicative scale of overall, both short term and long-term estimated costs prior to the implementation of a FOSS solution facilitates project funding, management and evaluation. Potential cost reduction should be also estimated and if possible validated upon completion of the project in order to assess its overall effectiveness.

2.1.7. Managing the risks

*“Plan
well
before
starting.
Work- in
progress
changes
are
painful”.*
*Municip
ality of
Bologna,
IT*

The OSEPA experience shows that in many FOSS projects, various organisational, managerial or technical problems that occurred had to be addressed on the spot, during implementation. Although this has not always prevented project success, it may have been the reason for delays or end-user discontent. It is therefore of great importance to determine what

could possibly go wrong or pose a serious threat to the project’s implementation. Adopting standardized ways and project monitoring tools and defining corrective actions or alternatives in case of failures should be an integral part of project planning and preparation. Various factors relating to human resources or technical issues should be foreseen: end-user unwillingness / resistance to change, hardware driver failures, software application bugs incompatibility, network infrastructure problems. Realistic time-planning and estimation of invested effort (person months) also minimises the risk of running out of resources.

*“Drive the
situation, always be
a step ahead of the
problem”.*

*Scriptum project,
Administration
Office of the Vice
President of
Hellenic Republic,
GR*

2.1.8. Preparing the staff for a smooth transition

*At the City of Schwaebisch
“the staff was trained on
the work so as to be able to
operate with the OSS
applications. At the end of
the training courses they
found their desktops ready
for use. In the meantime,
the administration was
equipped with workplaces
consisting of OSS
applications”.*

Migration to a
FOSS
environment is
not always well

received if not explained and presented in a clear and thoughtful way to the organisation's staff. Preparing the staff through e-mail dissemination and awareness raising events, presentations, seminars and training sessions, info days and discussion meetings, is a good practice that, where applied, has helped end-users adopt changes.

Such an approach should be also applied on a “begin with the basics” basis. Introducing mainstream FOSS products in daily activities and providing hands-on experience with certain FOSS components and applications can minimize staff resistance to new practices and facilitate the integration of more complicated and demanding FOSS solutions. This is closely linked to the need for a clearly defined migration strategy that will either target user groups or individual users, depending on the organisation's size. Although a user-by-user approach could be suitable for pilot FOSS implementations, a user-group method would be more suitable for large-scale migration projects.

2.1.9. Caring for the needs and opinions of the end-users

“A public administration should work with active support to the end users”. Municipality of Alingsås, SE

End-users, either internal staff within a public organisation or citizens as recipients of IT services, are the ones to define the success and sustainability of any FOSS solution and therefore planning and implementation of any FOSS project should reflect, as possible, their needs and expectations. Interaction with end-users should include a two way process: 1) providing support, guidance and training resources to users 2) getting feedback on the needs, views and experiences of users.

“Release new versions at least bi-monthly for the



organisations users
European Regional Development Fund
to test and get ideas

for new or improved functionality.

Creativity is triggered by testing the application hands on”.

Municipality of Umeå, SE



The City of Schwaebisch encountered some “bureaucratic problems, such as the inadequate endorsement by the responsible departments for the migration to OSS”.

2.1.10. Fighting bureaucracy

In migrating to FOSS, public administrations are sometimes involved in burdensome administrative processes that can hinder or delay implementation. Clarifying as possible the legal and institutional framework between all agencies, organisations or

departments that involve in IT policies, infrastructures and software procurement will speed up project implementation and facilitate its sustainable management.

2.2. TECHNICAL GUIDELINES

2.2.1. Making a full record of existing systems and applications.

The first step in introducing FOSS systems and applications in a department or organisation should be a full record of existing IT infrastructure (hardware and networks) and in-use operating systems software applications. Getting a detailed view of currently in-use software and hardware will help define desired technical specifications and requirements for FOSS systems and will facilitate a much less troubled integration of new hardware units and software components. Some indicative features that should be recorder are: number and type of hardware units (server/client) software application names and version, types and versions of operating systems, number of supported users for each application, required applications and dependencies, communication protocols, supported languages and file formats.

2.2.2. Defining technical areas and required components

It is critical, in any FOSS migration project, to have a clear view of the technical areas (server, client, network) and software components (both open source and proprietary) that are required for installation and deployment. Server-based systems, for example, require pre-existing web or application servers and more advanced installation and configuration processes. Some applications also require a parallel deployment or co-existence of both open source and proprietary components that should be carefully taken into account in order to avoid compatibility failures.

2.2.3. Defining source code modification / customisation level

*“Software packaging and deployment of the solution had to be assigned to an external company due to the complexity of this task”.
The City of Freiburg, DE*

One of the most important issues to clarify prior to implementing a FOSS solution is the level of required source code modification or application customisation as this can affect the overall cost, duration and success of a project. While mainstream, packaged FOSS application suites may only

require limited customisation (e.g. OpenOffice), less supported or purpose-built systems and applications may involve advanced configuration, source code modification, or from-scratch software development to meet the needs of an organisation. It is important that public administrations make a clear assessment of this aspect during the planning process and make sure, at an early stage, that either their own technical staff has the skills and experience to support more demanding FOSS solutions or that they can rely on external support and expertise to implement their project.

2.2.4. Choosing a technically mature solution

There are considerable differences between various distributions of an open source software system or applications that should be carefully assessed before making a choice. Some applications maintain bare-bone features based on source code that give developers and IT managers maximum room for custom-built solutions. Mature, mainstream and stable products, however, can significantly minimize the risks of bugs, failures and constant troubleshooting

while still providing access to the source code, if needed. Major, most widely used distributions (e.g. OpenOffice, Ubuntu Linux, Suse Linux), some of which are supported by commercial companies (e.g. Linux Enterprise Server), provide complete documentation, fixes and updates. A good practice, especially when an organisation cannot exclusively rely on in-house or external technical support, is choosing stable, mature and tested open source systems and applications with full updating support and documentation.

2.2.5. Checking compatibility prior to implementation

As shown in collected case studies, software/hardware compatibility failures often had to be solved during the implementation of a FOSS project. This is a critical aspect, particularly for large scale migration projects in which a compatibility failure could threaten the entire project. To avoid this, possible failures should be foreseen prior to implementation and specific issues should be addresses such as: 1) availability of hardware drivers 2) compatibility of hardware units with operating systems 3) collaboration of open source systems and applications with existing proprietary software systems.

2.2.6. Using open standards

A transition to open source software also means a significant transition to open data standards (ODS). The use of ODS facilitates interoperability and data preservation, particularly in public administrations which, due to their obligations, maintain large datasets and heavily rely on document-based communications with citizens. There is now is a common understanding among public administrations in Europe that they should rely on open document formats for electronic

"We have implemented Open Office as standard office-software in the municipality administration and in the education at the local schools. ODF and PDF were also implemented as standard document formats."
Alingsås, Västar Götaland, SE

document exchange and storage avoiding to impose the use of specific software products.⁷ Moreover, consistently using open data standards and document formats (e.g. ODF, PDF, PostScript, RTF) along with proprietary software applications will make life easier when attempting to migrate to FOSS.

2.2.7. Preparing content

“There were a lot of changes and modifications related to the structure of the OSS solution until the final version was developed and there were a lot of preliminary data to be imported to the database server. There was a lot of dirty data”.
Jihlava/Vysocina Region,
CZ

Preparing clearly structured and categorised data will save a lot of time and resources when imported in open source platforms and applications.

Dividing and categorising data

according to use and purpose, file formats (open or proprietary), storage specifications or required tasks (e.g. conversion, translation, modification) will speed up migration process and minimize the impact on functionality and productivity within a public organisation.

⁷ See “Conclusions and recommendations on Open Document Formats”, Pan-European eGovernment Services Committee (PEGSCO) 2006.

2.3. SUSTAINABILITY GUIDELINES

2.3.1. Evaluation

Adopting and integrating open source software systems and applications in an organisation's IT infrastructure is a long process that should be continuously monitored and evaluated in terms of end-user satisfaction, cost-effectiveness and improvement in various operational fields (e.g. productivity and performance, independence from vendors lock-in, enhancement of IT system security and administration). Evaluating a FOSS project through predefined standards and criteria (e.g. total amount of cost savings, overall end-user satisfaction, increase of productivity) and by getting both internal feedback and -if possible- external expert opinions is the best way to ensure that all identified weaknesses will be addressed and benefits will have a long-term impact within the organisation. In addition, tested and evaluated FOSS projects that produced validated results are more likely to be transferred or replicated.

2.3.2. Staff involvement

Motivating and involving a large number of staff, an entire department or even an entire organisation in the integration of a FOSS solution is the best way to ensure that end-users are going to actively participate, share experiences and keep on using the systems or applications introduced. Personal involvement empowers staff and provides a sense of responsibility to wisely use and maintain an adopted IT solution.

2.3.3. Seeking support from central agencies and higher officials

“Nowadays the document management system is in operation and more than 2.000 stakeholders have been interested in the system today.”

*OSS Alliance
National Public Organisation, CZ*

As shown by experiences shared in the OSEPA project, support from central, national

*“The contribution of higher governmental officials through directives, guidelines and policies is a major success factor”
The City of Freiburg,
DE*

agencies or higher governmental officials is considered to be a great help to public administrations attempting a transition to open source software. This support is not limited to funding but also refers to standards and guidelines, consensus building and stakeholder motivation. Joint initiatives and collaborations under an “umbrella” agency can attract potential adopters and increase the transferability of best practices.

2.3.4. Providing documentation and language support

*The City of Schoten, BE,
provided support for its
Asterisk Telephony*

*System in English, Dutch,
German and French. The
City of Freiburg provided
support for migrating to
OpenOffice in most major
languages. More than
40% of the OSEPA good
practice case studies
provided support for at
least 2 languages.*

Providing full documentation (e.g. user manuals, installation guides, resources) and language support is critical particularly for open source systems and

applications which are mostly maintained by their user or developer communities. FOSS deployments with poor documentation or language support limit down the number and range of their potential users or contributors.

2.3.5. Working with the open source community

Open source projects are developed, tested and maintained by a growing community of users and developers that provide tools and resources, software application fixes and updates, feedback and troubleshooting advice, networking and collaboration opportunities. Interacting with the open source community -both getting and giving back- is the best way to get cost-free, ongoing

support or even build interest groups or networks that will help extent an open source solution applied by an organisation.

*“Widely
share your
project
model.*

*Communicat
e”!*

*Municipality
of Bologna,
IT.*

2.3.6. Reaching out to peers and stakeholders

As shown by collected case studies and experiences in OSEPA, many needs and problems relating to software applications and IT infrastructures are shared by several public administrations with similar obligations and organisational profiles.

In that sense, solutions can be shared as well. Identifying peer organisations and related practices, giving consent and providing information to potential adopters, exchanging experience with other public administrations and stakeholders is a wise investment on the sustainability of adopted FOSS practices and solutions.

3. References

OSEPA project deliverables

1. Good Practice Guide covering various aspects of FOSS usage by European Public Administrations. 1st (interim) version. Deliverable implemented by OSEPA partner CTI-Diophantus.
2. Catalogue of case studies on open source software. Deliverable implemented by OSEPA partner City of Schoten.
3. “Planning report setting out the methodology and the criteria with which partners’ practices will be examined and synthesized”. Deliverable implemented by OSEPA partner Research Academic Computer Technology Institute.
4. “Report on the methodology and the tools for investigating partners’ practices on FOSS usage”. Deliverable implemented by OSEPA partner City of Schoten.
5. Task Allocation List of the Partnership Agreement between KEDKE (Central Union of municipalities and communities of Greece) and the OSEPA partners.

Guidelines and recommendations

1. Conclusions and recommendations on Open Document Formats”, Pan-European eGovernment Services Committee (PEGSCO) 2006.
2. The IDA Open Source Migration Guidelines, November 8, 2003. Accessible at: <http://ec.europa.eu/idabc/servlets/Doc5621.pdf?id=1983>

Web resources

<http://ec.europa.eu/idabc/>

<http://www.osor.eu/>

<http://joinup.ec.europa.eu/>

4. ANNEX: List of good practice cases.

4.1. Operating systems

4.1.1. Migration to OSS in desktop PCs and servers , Schwaebisch, DE						
Title	Migration to Open Source in desktop PCs and servers					
Organisation	City of Schwaebisch Hall, Baden-Wuerttemberg, Germany					
Description	<p>In 2001, as the support for the operating system and the office application, which have been used up to then, was discontinued by the software suppliers and the City of Schwäbisch Hall would have to pay substantial license fees for the hardware and software upgrade, the IT department of the City of Schwaebisch Hall decided to assess new alternatives. The positive experiences with OSS in the past encouraged the administrators to use OSS also for the equipment of the future workplaces. After the starting signal by the mayor, the EDP (Electronic Data Processing) department with SUSE (now Novell) and IBM provided the first computers with the operating system Linux and OpenOffice for text processing, spreadsheet, presentation etc. The staff was trained on the work so as to be able to operate with the OSS applications. At the end of the training courses they found their desktops ready for use. In the meantime, the administration was equipped with workplaces consisting of OSS applications.</p>					
Duration / Preparation	Date/Year	2002-2005	Person months	>36	Staff preparation	Yes
Implementation	Internal / External		Mostly in-house	Est. cost	15k – 49k €	
Software components / licenses	<p>The major open source components used by the City of Schwaebisch Hall for the migration to OSS were:</p> <ul style="list-style-type: none"> In servers: SUSE Linux enterprise server, OpenLDAP, NFS, Samba, OpenXchange server, Ingres database In clients: SUSE Linux, KDE, OpenOffice, Mozilla Firefox, GIMP, Mediawiki. <p>Licenses: GPL, LGPL, X11, Apache, Java and BSD. The following proprietary components were used: Citrix-Clients, VMware and MS-Terminal Server.</p>					
Source code / documentation	Source code modification	No	Documentation languages		English, German	
Main results /achieved objectives	<ul style="list-style-type: none"> Strategic independence from vendors lock-in Flexibility of applications Promotion of safe enterprise through multiple developers and medium-size suppliers. Digital preservation through the use of open formats and standards 					
Perspectives	The staff in the City of Schwaebisch Hall continues to use the installed open source					

	applications in desktop and server PCs and the city administration is determined to continue and to expand its open source strategy.					
Contact / info	Mr. Horst Braeuner, horst.braeuner@schwaebischhall.de http://www.schwaebischhall.de/en/welcome/linux.html					
4.1.2. Diffusion of open source software, Modena, IT						
Title	Diffusion of open source software in the Municipality of Modena					
Organisation	Municipality of Modena					
Description	The use of open source software has been debated in the city council for the first time in 2004 and presented again in the following years. Main reasons: saving costs on software licence fees and diffusion of open source software culture. The first project included a migration from Microsoft Office to OpenOffice. There was some initial resistance to the change by MsOffice's users. After 1 year of training and help desk, users have changed attitude towards it. The second project involved a replacement of mainframe with a Linux server. Most servers have now Linux OS installed.					
Duration / Preparation	Date/Year	01.02.2006	Person months	6 – 12	Staff preparation	Yes
Implementation	Internal / External		Mostly in-house	Est. cost	100.000 – 499.000 €	
Software components / licences	Standard software installed on workstations: OpenOffice, Mozilla Firefox, Thunderbird. Standard software installed on servers: Linux (OS), Alfresco (DMS), Apache (web server), Tomcat (servlet container), JBOSS (application server), MySQL (DB), Plone (CMS), openNMS (monitoring), openLDAP (authentication manager), PHP. HTWC Xframe Licences used: CDDL, GNU GPL, BSD, Apache Oracle.					
Source code / documentation	Source code modification	Yes	Documentation languages	Italian		
Main results /achieved objectives	<ul style="list-style-type: none"> • Cost savings: the diffusion of OSS allowed Municipality of Modena to save about 800.000 euro per year • Strategic independence from vendors lock-in • Promotion of open source culture 					

Perspectives	In operation. To be sustained / replicated.					
Contact / info	Laura Seidenari laura.seidenari@comune.modena.it http://www.comune.modena.it/					
4.1.3. Ubuntu-based multiseat PC solution for public library, BE						
Title	Ubuntu-based Multiseat PC solution					
Organisation	Sint-Genesius-Rode Public Library, BE					
Description	Multiseat PC solution - 1 PC with 4 workstations and 1 laserprinter -installed in the library for use by the public, internet access included. PCs run Ubuntu/Linux with KDE elements in desktop.					
Duration / Preparation	Date/Year	01.03.2011	Person months	N/A	Staff preparation	No
Implementation	Internal / External		Mostly external	Est. cost	1 – 14.999 €	
Software components / licenses	Ubuntu/Linux solution.					
Source code / documentation	Source code modification		No	Documentation languages		All languages supported by Ubuntu
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendors lock-in • Reduction of procurement (licensing) cost • Minimize the need for technical support 					
Perspectives	In operation. Has been replicated to similar public organisations.					
Contact / info	Dirk Delval dirk.delval@sint-genesius-rode.be http://www.sint-genesius-rode.be www.multi-seat.be					

4.2. Document management and office applications.

4.2.1. Migration of 2.000 office users from MS Office 2003 to OpenOffice 3.21, Freiburg, DE						
Title	Migration of 2.000 office users from MS Office 2003 to OpenOffice 3.21, Freiburg, DE					
Organisation	City of Freiburg, Baden-Württemberg, Germany					
Description	<p>In early 2007 the City of Freiburg was looking to replace the proprietary software used for word processing with an open source software application. In February 2007 the City of Freiburg started to study the alternatives and six months later the responsible officers decided to migrate from MS Word 2003 to OpenOffice 3.21 in 2.000 client computers. Two years later the migration was completed with only a few person months to be invested from the internal resources of the City of Freiburg for the implementation process. <i>“Open source and open standards are part of the Freiburg eGovernment Strategy. The migration project to OpenOffice was ... intended to lead the way to open and interoperable document formats. Beyond that it helped to save almost half a million Euros of licence fees. Additional benefit was generated with the introduction of Wollmux ... Internal document based communication is now 100% open, while external document exchange still suffers compatibility issues because of the indolence in adapting open formats by the several levels of public administration in Germany.”</i></p>					
Duration / Preparation	Date/Year	2007-2009	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External	Mostly in-house		Est. cost	50k – 99k €	
Software components / licenses	<p>The major OSS components which have been used are OpenOffice 3.21, Wollmux 6.50, Mozilla Firefox 3.54, SUSE Linux enterprise server, MySQL database, PHP and Apache web server. No proprietary software component has been used. LGPL (Lesser General Public License) and EUPL (European Union Public License) licenses were granted to the City of Freiburg for the migration to OSS.</p>					
Source code / documentation	Source code modification	Yes	Documentation languages	Most major languages		
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendors lock - in • Reduction of procurement (licensing) costs • Optimization/ Simplification of organisation processes 					
Perspectives	<p>The 2.000 users within the City of Freiburg still use OpenOffice 3.21 for word processing and the perspective for OpenOffice 3.21 for the next years is to be retained and sustained within the organisation.</p>					
Contact / info	Mrs. Ruediger Czieschla, ruediger.czieschla@stadt.freiburg.de					

	www.freiburg.de/openstandards
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4.2.2. Open – source document management system for the public administration based on the national legal requirements, CZ						
Title	Open – source document management system for the public administration based on the national legal requirements.					
Organisation	OSS Alliance, Czech Republic					
Description	<p>OSS Alliance, a national public organisation of Czech Republic, created in 2009 an administrative application based on open source software for the administering and the management system of documents in public administrations. The developed document management system is based on PHP and MySQL and is licensed under EUPL license. The source code of the OSS components was modified so as to meet the needs of the organization. The developed open source document management system is developed with compliance to the national legal requirements. It can be applied to every public administration that has the legal rights to use this type of application. Some key features of this management system are:</p> <ul style="list-style-type: none"> - management of physical documents and e-documents, - implementation of storage and archiving, - administering of document workflow, - connection to other document management systems, - enabling searching features in documents, - development of reports & printing enabling, - receiving and sending documents, - provision of support for eGovernment projects 					
Duration / Preparation	Date/Year	2009	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External	Both in – house and external		Est. cost	100k – 499k €	
Software components / licenses	The developed document management system is based on PHP and MySQL and is licensed under EUPL license.					
Source code / documentation	Source code modification	Yes	Documentation languages	Czech		
Main results /achieved objectives	<ul style="list-style-type: none"> • The strategic independence from vendors lock-in • The reduction of procurement (licensing) costs 					
Perspectives	Nowadays the document management system is in operation and more than 2.000 stakeholders have been interested in the system today. In OSS Alliance they are about to finish and release the next enhanced version of the document management system.					
Contact / info	Mr. Jaroslav Krotky, vysovina01@bestpractices.osepa.eu http://www.spisovka3.cz					

4.2.3. Migration to OpenOffice and adoption of ODF and PDF as standard document formats, SE

Title	Migration to OpenOffice and adoption of ODF (Open Document Format) and PDF (Portable Document Format) as standard document formats					
Organisation	District council of the municipality of Alingsås, Alingsås, Västar Götaland, Sweden					
Description	<p>In August 2009 the district council of the municipality of Alingsås decided to replace Microsoft Office with OpenOffice as standard office application and also to adopt ODF and PDF file formats as document formats for documents in a workflow and for fixed documents respectively. The main motive to migrate to open source was the reduction of software procurement costs by the replacement of MS Office with OpenOffice and the autonomy from software proprietary vendors. <i>"The municipality of Alingsås joined with other municipalities a public call to the vendors of software for Swedish municipalities."</i> The municipality asked from suppliers of municipal management system to open up their applications for the open standard and drop the hard links to Microsoft Office. A joint letter, dated in February 2009, from a number of municipalities to the system vendors requires transparency:</p> <p>http://www.kivos.se/openoffice/skrivelse-om-oppnhet-till-leverantorer</p>					
Duration / Preparation	Date/Year	2009	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External		Mostly in-house	Est. cost	15k – 49k €	
Software components / licenses	The open source components used by the municipality of Alingsås and the local schools were OpenOffice and OpenClipart. No modification of the source code was made and the license granted was GNU Lesser General Public License. The proprietary software used was ZENworks and MSI packets for the installation of OpenOffice.					
Source code / documentation	Source code modification	No	Documentation languages		Swedish	
Main results /achieved objectives	<ul style="list-style-type: none"> • Strategic independence from vendors lock-in • Reduction of procurement costs 					
Perspectives	In the municipality of Alingsås and in the local schools, they keep on using OpenOffice and adopting ODF and PDF standards, as standard document formats, and the perspective for the next years is to endure the usage of the aforementioned OSS components.					
Contact / info	Mr. Göran Westerlund, goran.westerlund@alingsas.se www.kivos.se					

4.2.4. Migration to Open Office in the Province of Bologna, IT

Title	Migration to Open Office in the Province of Bologna, IT					
Organisation	Province of Bologna, Emilia-Romagna Region, Italy					
Description	The decision to adopt OpenOffice was taken from the director of IT in agreement with the General Director and the political leadership of the organisation. The critical factors that influenced the decision were: saving of resources, independence from a single supplier, increased freedom to modify the software, the recommendation of "Codice dell'amministrazione digitale". The migration process -still in progress- involves the following stages: installation of OOO, training in classroom and distance learning, removal of MSOffice, troubleshooting and activating a Help Desk service.					
Duration / Preparation	Date/Year	01.04.2010	Person months	12 – 24	Staff preparation	Yes
Implementation	Internal / External		Both in-house and externally	Est. cost	1 – 14.999 €	
Software components / licenses	Open Office Writer, Calc, Impress. Some OOO extensions were developed in order to be able to save documents in the Hummingbird document management system. LGPL licences were used.					
Source code / documentation	Source code modification	Yes	Documentation languages		Italian	
Main results /achieved objectives	<ul style="list-style-type: none"> • Cost reduction and saving of resources • Independence from a single supplier • Increased freedom in software modification • Compliance with the legal framework for digital administration • Improvement of performance and effectiveness of the organisation • Optimization / Simplification of organisation processes • Improved software interoperability 					
Perspectives	Still in progress. To be sustained/retained.					
Contact / info	Paola Natali: Paola.Natali@provincia.bologna.it http://www.provincia.bologna.it/probo/Engine/RAServePG.php/P/1318510010600					

4.2.5. Migration to Open Office in the Municipality of Bologna, IT

Title	Migration to open office in the Municipality of Bologna					
Organisation	Municipality of Bologna					
Description	Migration from an old consolidated situation with Office 97 installed on 3600 PCs to an OpenOffice.org configuration. Half of the PCs were fully migrated due to applications constrains (IBM Lotus Domino applications using Office dll). OpenOffice.org was installed on all PCs but Microsoft Office was removed only from half of them. Users with both suites are encouraged to use OpenOffice.org as the main productivity suite. <i>“We hope to improve migration with an ongoing substitution of Domino applications with their web counterparts”.</i>					
Duration / Preparation	Date/Year	01.03.2008	Person months	24-36	Staff preparation	Yes
Implementation	Internal / External		Mostly by external consultants	Est. cost	b. 15.000 – 49.000 €	
Software components / licenses	Openoffice.org with heavy customization and use of extensions and macros. Every openoffice.org extension developed was released as GPL.					
Source code / documentation	Source code modification	No	Documentation languages		Italian	
Main results /achieved objectives	<ul style="list-style-type: none"> • enhancement of performance and effectiveness of the IT system • strategic independence from vendors lock-in • reduction of procurement cost • enhancement of performance and effectiveness of the IT system 					
Perspectives	In operation. To be expanded/ enhanced/ replicated.					
Contact / info	Dimitri Tartari d.tartari@gmail.com http://www.comune.bologna.it					

4.2.6. Scriptum: a platform for Government Document Management, GR

Title	Scriptum: a platform for Government Document Management.
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Organisation	Administration Office, Vice President of the Hellenic Republic.					
Description	<p>Scriptum is a web based open-source application that will be used in order to eliminate bureaucracy and document loss, providing the administration office of the Vice President of the Hellenic Republic an extensible and integrated environment for document publishing, categorisation and administration. The overall project involves two basic sub projects: 1. e-Protocol: for handling incoming/outgoing mail messages and their attachments. Using this system, the e-Protocol users can benefit from the advanced OpenKm properties in order to manipulate the messages. This subsystem provides an easy way to complete forms relevant to the incoming/outgoing mail, form letters from templates and maintains a document repository equipped with document based security. 2. e-Case: this sub system provides a well established work-flow for treating documentation relevant to specific organisation's operations. Assignment operations provides a standard way for managing and directing specific actions to be taken from the employees in the administration office of the Vice President of the Hellenic Republic in order to complete the organisation's operations.</p>					
Duration / Preparation	Date/Year	10.01.2011	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External		Implemented mostly by external consultants	Est. cost	15k – 49k €	
Software components / licenses	Architectural Blueprint – Technology Stack: 1. J2EE 6 2. Hibernate 3 3. ZK 3.5 4. JBOSS 4.2.3.GA 5. OpenKM 5.0 6. MySQL Server 5.1 as OpenKM and SCRIPTUM storage. Servers to install : SUSE Linux enterprise server. Licenses: GPL, LGPL, Apache, Java					
Source code / documentation	Source code modification	No	Documentation languages		Greek, English	
Main results /achieved objectives	<p>The main objective of SCRIPTUM is to eliminate bureaucracy and document loss using an open source, extensible environment ready to interconnect with other systems within the Greek public sector. Some of the main achievements were:</p> <ul style="list-style-type: none"> • improvement of performance and effectiveness of the organisation • strategic independence from vendors lock-in • facilitation of the exchange of data and shared development strategies • promotion of FOSS 					
Perspectives	The implemented solution is in operation and it is expected to be expanded or replicated in the future.					
Contact / info	Michael Mountrakis: mountrakis@uit.gr Official Page: http://www.scriptum.gr Wiki and Developer page: http://projects.ellak.gr/projects/scriptum/wiki					
4.2.7. Migration to Open Office, The State Social Insurance Agency, Riga, LV						
Title	Migration to Open Office, The State Social Insurance Agency, Riga, LV					
Organisation	The State Social Insurance Agency, Riga, LV					

Description	We adopted open source desktop office suite (OpenOffice.org) instead of upgrading Microsoft Office to newest version. We also adopted open source Zabbix monitoring system. None had tried to replace Microsoft Office with OpenOffice.org on such large scale before. This required to develop internal knowledge about all possible issues, and also required very detailed analysis before making decisions. Also with migrating OpenOffice.org, a new way how to deal with support were introduced - every release was tested on created image specially packaged for working stations. This helped also centralize and plan expenses for support.					
Duration / Preparation	Date/Year	2005-2006	Person months	N/A	Staff preparation	Yes
Implementation	Internal / External		Mostly in-house	Est. cost	N/A	
Software components / licenses	OpenOffice.org office suite, Zabbix monitoring system, GNU/Linux operational system for servers. GPL, LGPL.					
Source code / documentation	Source code modification	No	Documentation languages		English	
Main results /achieved objectives	The main objectives where to reduce licensing costs and achieve independence from vendor lock-ins.					
Perspectives	To be expanded/ enhanced/ replicated					
Contact / info	Peteris Krisjanis: pecisk@gmail.com http://www.vsa.lv/					

4.3. Administrative applications

4.3.1. Helpdesk and inventory software based on open source software, BE

Title	Helpdesk and inventory software based on open source software					
Organisation	Local Police of Brasschaat, Brasschaat, Belgium					
Description	<p>In 2009 the Local Police of Brasschaat decided to implement a helpdesk and an inventory software based on OSS in order to reduce the software procurement costs. After 3 months of studying, the Local Police of Brasschaat started to implement the open source solution. Only a few person months were invested from the internal resources of the organisation and the open source solution was finally developed. The OTRS (Open Source Helpdesk and IT Service Management Solution) and the OCS (Open Source and Software Inventory Next Generation) accompanied with GLPI (Information Resource Manager) were used so as to meet the needs of the Local Police of Brasschaat.</p>					
Duration / Preparation	Date/Year	2009	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External		Both in-house and external	Est. cost	1 – 15k €.	
Software components / licenses	<p>The helpdesk and the inventory software were implemented on SUSE Linux enterprise server and a KVM (Kernel based Virtual Machine) was used for their virtualisation. The source code of the open source component was not modified and the license granted for the OSS solution was the license for SUSE Linux 11. No proprietary software component was used.</p>					
Source code / documentation	Source code modification	No	Documentation languages	English, Dutch		
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Simplification of IT architecture 					
Perspectives	<p>In the Local Police of Brasschaat the open source solution adopted is still in use and the perspective for the next years is to be enhanced, expanded or replicated.</p>					
Contact / info	<p>Mr. Roel De Pooter, ict@politiebrasschaat.be www.politiebrasschaat.be</p>					

4.3.2. Asset management infrastructure, Bologna, IT

Title	Asset management infrastructure. Municipality of Bologna					
Organisation	Municipality of Bologna					
Description	Creation of an Asset Management infrastructure for the Municipality of Bologna. Following ITIL indication this infrastructure is also used to handle MACD and provisioning processes.					
Duration / Preparation	Date/Year	01.01.2008	Person months	6 – 12 [Staff preparation	Yes
Implementation	Internal / External		Both in-house and externally	Est. cost	15.000 – 49.000 €	
Software components / licenses	CMDBuild, OCS-NG GPL Licence.					
Source code / documentation	Source code modification	Yes	Documentation languages		Italian	
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Enhancement of performance and effectiveness of the IT system • Cost reduction • Facilitation of the exchange of data and shared development strategies 					
Perspectives	In operation. To be expanded/ enhanced/ replicated					
Contact / info	http://www.cmdbuild.org/diffusione/cmdbuild-day Valentina Zerbini: valentina.zerbini@comune.bologna.it					

4.4. E-mail & communication applications

4.4.1. Zimbra: Next-generation email, calendar and collaboration server, ES						
Title	Zimbra: Next-generation email, calendar and collaboration server					
Organisation	Foundation for the Development of the Science and Technology in Extremadura, Extremadura, Spain					
Description	In January 2009 the Foundation for the Development of the Science and Technology in Extremadura started to study the potential adoption of Zimbra server. Six months later, the decision was taken: Zimbra would be installed in the public administration. Zimbra is a next-generation collaboration server that provides organizations greater overall flexibility and simplicity with integrated email, contacts, calendaring, sharing and document management plus mobility and desktop synchronization to users on any computer.					
Duration / Preparation	Date/Year	2009	Person months	1-6	Staff preparation	No
Implementation	Internal / External		Mostly in-house	Est. cost	1 – 15.000 €.	
Software components / licenses	The Zimbra collaboration suite is the only application suite installed on the server, which bundles and installs, as part of the installation process, various other third party and open source software, including Apache Jetty, Postfix, OpenLDAP, and MySQL.					
Source code / documentation	Source code modification	Yes	Documentation languages		English, Spanish	
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Reduction of procurement/ licensing costs • Promotion of open source software • Minimization of the need for technical support 					
Perspectives	At the Foundation for the Development of the Science and Technology in Extremadura they keep on using Zimbra server and the perspective for the next years is to be enhanced, expanded or replicated.					
Contact / info	Mr. Nicolas Lopez de Lerma, nicolas@fundecyt.es http://www.zimbra.com/					

4.4.2. Asterisk telephony system, Schoten, BE						
Title	Asterisk telephony system					
Organisation	City of Schoten, Antwerp region, Belgium					
Description	<p>The city of Schoten was looking for a new telephony system at a reasonable price. The new system should be capable of integrating new applications, such as SMS (Short Message Service), MMS (Multimedia Messaging Service), chat and Skype and also integrating with existing and future installations. The IT (Information Technology) department should also be able to configure the telephony system according to the needs and requirements of the organisation. The telephony system should also be redundant. In 2006 the IT department of the City of Schoten started to study the possible solutions. Six months were invested for this study phase before the adoption of Asterisk telephony system. In 2007 the IT department started to implement the Asterisk solution and spent four months for this implementation. Synsip, a provider in VoIP solutions undertook the installation of Asterisk: <i>“Synsip had a good migration plan and there was a very good transfer of their knowledge in the City of Schoten”</i>.</p>					
Duration / Preparation	Date/Year	2006-2007	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External	Both in-house and external		Est. cost	50.000 – 99.000 €	
Software components / licenses	<p>The open source component used for the development of the Asterisk solution was MySQL / PostgreSQL database. The configuration files of this system can be accessible and modifiable. A redundant solution can easily be developed and especially, through the investment of few internal resources. A scope server and a GUI (Graphical user interface) were used to manage Asterisk proprietary components. The license granted for the implementation of the Asterisk telephony system was GPL for Asterisk license.</p>					
Source code / documentation	Source code modification	No	Documentation languages	English, Dutch, French, German		
Main results /achieved objectives	<ul style="list-style-type: none"> • Reduction of procurement/ licensing costs • Improvement of performance and effectiveness of the organisation • Enhancement of performance and effectiveness of the IT system 					
Perspectives	Asterisk telephony system is nowadays in operation and the perspective for the next years is to be enhanced, expanded or replicated.					
Contact / info	Mr. Jan Verlinden, jan.verlinden@schoten.be www.digium.com , www.voip-info.org					

4.4.3. Asterisk telephony solution, Vysocina, CZ						
Title	Asterisk telephony solution, CZ					
Organisation	Vysocina Region					
Description	The main advantage of the Asterisk solution was its cost, complexity and a very positive response from companies that already operate it. Based on market research a decision was made to use the Asterisk solution to replace the old analogue telephone exchange. The telephone exchange was used in distributed CRM solutions, where a single call center operators were composed of various communities and organizations connected with the SIP protocol.					
Duration / Preparation	Date/Year	01.01.2009	Person months	1-6	Staff preparation	No
Implementation	Internal / External		both in-house and externally	Est. cost	1 – 14.999 €	
Software components / licenses	Asterisk PBX, AstBoxLinux, Mysql, PHP, Apache GNU General Public License					
Source code / documentation	Source code modification	No	Documentation languages		Czech, Slovak, English	
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendor lock-ins • Enhancement of performance and effectiveness of the IT system • Optimization of organisation processes • Cost reduction 					
Perspectives	In operation. To be expanded/ enhanced/ replicated.					
Contact / info	Jaroslav Krotky vysocinaA1@bestpractices.osepa.eu					

4.4.4. Jitsi: open source real-time communications system, FR

Title	Open source real-time communications system, FR
Organisation	University of Strasbourg, Strasbourg / Bas Rhin
Description	<p>Skype is, without a doubt, one of the most popular communications solutions in the world. It is seeing wide adoption in various entities, be it public or private. A few years ago, however, the French Ministry of Defence issued a memorandum advising against the use of Skype in French universities and research centres. Their concerns were based on Skype's obscurity and the security implications that it had. Another problem raised by the ministry was Skype's use of Internet resources. The university networks are one of the last places where a high number of computers use public IP addresses on a relatively high bandwidth. Most of the computers using Skype in such network, would hence automatically transform into Skype supernodes: computers that other Skype instances would use freely to relay media when necessary. The recommendation was acknowledged by most universities but it was rarely enforced. The reason for this was quite simple: Skype was an essential communications tool in a number of collaborative projects and any ban on using it needed to be accompanied with an alternative. That alternative needed to be: free of charge, easy to use, offer good quality for audio and video communication, be able to organise conference calls and -particularly important- make it possible to communicate with a large number of users without having to make these users use the same solution or infrastructure.</p> <p>This is when Jitsi came into consideration. Jitsi is an audio/video Internet communicator, with instant messaging capabilities. It supports a large number of protocols, starting with standardized ones like SIP and XMPP, as wells as other proprietary, but yet popular ones, such as Windows Live (MSN), Yahoo! Messenger, AIM and ICQ. (Audio and Video communication are only available with SIP and XMPP). Jitsi (formerly SIP Communicator) was born at the very same university which was probably why the name came up so quickly when the discussions started. It quickly became clear, however, that, when combined with the proper server-side components, it had the potential to become a true alternative of Skype. First of all, Jitsi had an impressive number of features. Things like good quality video, file transfer, conference calling, desktop streaming and sharing, to name but a few, are hard to come by in an open source application that is available on Windows, Mac OS X and Linux. More importantly, Jitsi's support for the XMPP protocol meant it would be possible for users in the University of Strasbourg, to conduct audio/video calls with anyone who had a Gmail account. This does</p>

	<p>make the solution comparable to Skype in terms of connection possibilities and it also addressed one of the university's main concerns for deploying a Skype alternative: it would only make sense if people would actually be able to talk to someone. It was hence decided that the following set of products would be deployed for use by students, researchers and other university personnel: XMPP was to be used as the backbone for this service and the server side would be covered by the Openfire XMPP server. It would use an existing LDAP directory for authentication. This way users won't need new accounts for this service. In order to make the application usable from anywhere on the Internet, TurnServer and JingleNodes were to be used for their NAT traversal capabilities. Finally, in order to provide free calling capabilities toward any PSTN number in the university conventional telephony network, FreeSwitch was to be deployed and connected to the existing telephony switches. Finally, in order to make the service as easily usable as possible, a few modifications were to be made on Jitsi so that connecting and using it in this particular environment was to be as easy as possible. The changes included the possibility to create accounts with minimum configuration, as well as automatically adding connections to the university's directories and telephony gateway. All these changes have been accessory only. It is still possible for users to connect with any standard XMPP agent if they so desire to. All of the above are currently in the process of being deployed.</p>					
Duration / Preparation	Date/Year	10.02.2010	Person months	6-12	Staff preparation	No
Implementation	Internal / External		Both in-house and externally	Est. cost	N/A	
Software components / licenses	<p>The main investment in the university was based on Jitsi: http://jitsi.org Other components employed in the architecture also include: Openfire http://www.igniterealtime.org/projects/openfire/ JingleNodes http://jinglenodes.org TurnServer http://turnserver.org FreeSWITCH http://www.freeswitch.org</p> <p>Changes made on Jitsi for the University of Strasbourg were delivered under an unrestricted perpetual license. The rest of the code in Jitsi and the other projects is being deployed under the original licences of the corresponding projects.</p>					
Source code / documentation	Source code modification		Yes	Documentation languages		French, English
Main results /achieved objectives	<ul style="list-style-type: none"> • A real-time communications system with audio, video, instant messaging and file transfer capabilities. (FOSS alternative of Skype). • Strategic independence from vendors lock-in • Facilitation of the exchange of data and shared development strategies • Enhancement of system security • Promotion of OSS • Software interoperability or compatibility 					
Perspectives	In operation. To be expanded/ enhanced/ replicated.					

Contact / info	Emil Ivov emcho@jitsi.org
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4.4.5. Antispam solution, Vysocina, CZ						
Title	Antispam solution, CZ					
Organisation	Vysocina Region					
Description	<p>AntiSpam solution - a solution based on SpamAssassin pearl scripts in Postfix.</p> <p>SpamAssassin is a software program released under the Apache License 2.0 used for e-mail spam filtering based on content-matching rules. The solution runs on FreeBSD and Postfix products in which pearl SpamAssassin scripts are deployed. The solution has 2 instances - for incoming and outgoing mail.</p>					
Duration / Preparation	Date/Year	01.06.2009	Person months	1-6	Staff preparation	No
Implementation	Internal / External	Mostly in-house		Est. cost	1 – 14.999 €	
Software components / licenses	Apache License 2.0					
Source code / documentation	Source code modification	No	Documentation languages	Czech, English		
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendor lock-ins • Cost reduction • Enhancement of performance and effectiveness of the IT system 					
Perspectives	In operation. To be retained / sustained.					
Contact / info	Jaroslav Krotký vysocinaC1@bestpractices.osepa.eu					

4.5. Servers, databases and internet applications

4.5.1. Touristic web portal, Vysocina, CZ						
Title	Touristic web portal					
Organisation	Jihlava/Vysocina Region, Czech Republic					
Description	<p>Vysocina Tourism, an allowance organisation of Czech Republic, started in March 2007 to study the possibility of creating a touristic web portal based on OSS tools in order to reduce licensing costs. Five months later, the Vysocina Tourism implemented the touristic web portal. Only four person months were invested from the internal resources of the Vysocina Tourim and the web portal was ready for use. <i>"We decided to use OSS because it was suitable solution for this project. Low (zero) cost and very good functionality of OSS software were the main motives for this selection. We had also very good knowledge and skills with implementation of OSS because we used these components in some small projects."</i></p>					
Duration / Preparation	Date/Year	2007	Person months	6-12	Staff preparation	No
Implementation	Internal / External		Mostly in-house	Est. cost	1 – 15k €.	
Software components / licenses	<p>The major OSS components used are the web server Apache 2, the hypertext preprocessor PHP4/5, Google API, MySQL database SQL server, Mozilla Firefox web browser, GIMP 2.6 graphical software and Open Office. The source code of the OSS components was not modified for the implementation of the solution and the license granted was GNU General Public License. The only proprietary software used was the operating system of the server, the Microsoft Windows 2003 Server.</p>					
Source code / documentation	Source code modification	Yes	Documentation languages		Czech, English	
Main results /achieved objectives	<ul style="list-style-type: none"> • Strategic independence from vendors lock-in • Enhancement of performance and effectiveness of the IT system • Promotion of open source software • Minimisation of technical support needs 					

Perspectives	Nowadays the touristic web portal is in operation and the perspective for the next years is to be expanded, enhanced and replicated.
Contact / info	Mr. Jaroslav Krotky, vysocina03@bestpractices.osepa.eu http://www.region-vysocina.cz/index.php?jazyk=en , http://www.region-vysocina.cz

4.5.2. Untangle: a powerful suite for Internet management applications, CY

Title	Untangle: a powerful suite for Internet management applications					
Organisation	Municipality of Strovolos, Nicosia, Cyprus					
Description	<p>In October 2009 the municipality of Strovolos was looking for an internet content filter solution with the less possible cost in order to enhance the productivity of the municipality's staff by minimizing the time spent on internet by the staff and also to strengthen the system security of the municipality. After one person month of studying the alternative solutions and half person month spent in the implementation of the Untangle application, the IT department of the municipality could finally benefit from the features of Untangle: web filter, virus blocker, spam blocker, ad blocker etc. <i>"It was both the Management and the IT department effort to have an internet content filter solution with the less cost as possible for the municipality. The solution was needed for the improvement of the productivity of the municipality's staff by minimizing the time spent on not work related on internet usage. In addition by implementing such a solution the effort was to provide better security for the Municipality network."</i></p>					
Duration / Preparation	Date/Year	2009	Person months	1-6	Staff preparation	No
Implementation	Internal / External		Both in-house and external	Est. cost	1 – 15k €.	
Software components / licenses	The only open source component used for the installation of the software package of Untangle was a Linux server. The source code of the application was not modified. No proprietary software component was used. Untangle is licensed under GNU Public License v2 (GPLv2).					
Source code / documentation	Source code modification	No	Documentation languages		English	
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendors lock-in • Reduction of procurement/ licensing costs • Enhancement of system security 					
Perspectives	Untangle application is nowadays in operation and the perspective for the next years is to be enhanced, expanded or replicated.					
Contact / info	Mr. Nicos Kyriakides, nkyriakides@strovolos.org.cy www.untangle.com					

4.5.3. JBOSS Information Portal, GR

Title	JBOSS Information Portal, GR					
Organisation	Municipality of Arcalochori					
Description	<p>JBOSS Portal Server OSS has been adopted for the development of an Information Portal for the Municipality having as main target the promotion of the local attractions.</p> <p>The Information Portal has been funded partially from EU and partially from national resources. The project has been successfully fulfilled in cooperation with the technology provider (CYBERCE SA), through an open tender. The final system consists of a set of OSS and commercial solutions, while the main Portal Server is JBOSS OSS software. During the project 5 Municipalities (Arcalochori, Thrapsano, Oropedio Lasithiou, Krousonas and Tylios) cooperated with the technology provider in order to fulfill necessary requirements. The communication of the involved parties has been excellent, but this could be considered as the most difficult task of the project (involvement of many key players). Data from the existing portals of the involved Municipalities have been successfully migrated to the new Information Portal.</p>					
Duration / Preparation	Date/Year	29.04.2009	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External	Mostly external		Est. cost	50.000 – 99.000 €	
Software components / licenses	<p>The selected OSS solutions for the development of the Information Portal include the following: JBoss Application Server (application server), JBoss Cache (complementary software of the application server), Jboss Profiler (traffic monitoring), JBoss Portal Server (portal server), OpenLDAP (LDAP server) and Eclipse IDE (development environment)</p> <p>ORACLE Database 10g Standard Edition ONE (database server), ArcGIS Server Workgroup standard & ArcGIS 9.x ArcEditor Concurrent - includes ArcPress – ArcScan(GIS software), NowSMS/MMS Gateway - Now Wireless (SMS software), VERISIGN Secure Site Pro (server certification).</p>					
Source code / documentation	Source code modification	Yes	Documentation languages	English, Greek		
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Facilitation of the exchange of data and shared development strategies • Promotion of oss Experimentation with new IT technologies 					

Perspectives	In operation. Has been replicated to similar public organisations.
Contact / info	George Lytras g.lytras@cyberce.gr

4.5.4. Digital Visit Guide, Umeå, SE

Title	Digital Visit Guide, SE
Organisation	Municipality of Umeå
Description	<p>The guide is a web application built in the Joomla CMS with an interface suited for mobile phones. Joomla is in turn built on a LAMP-stack (Linux, Apache, MySQL, PHP). The Mobile Guide is accessed using the web browser of a mobile phone or a tablet/computer. The code was originally developed for Joomla 1.5.xx but has been or is about to be adapted to Joomla 1.6.xx. The additional templates, plug-ins and components created to enhance the existing functionality in Joomla have also been released as OSS, hence making it possible for anyone wanting to adapt and use the guide to do so. The project has created official visitor guides accessed using web browsers on mobile phones. Existing open source software (OSS) has been combined with extensions created by the project to achieve the required functionality. The guides were created to provide visitors with information when tourist bureaus and tourist-oriented companies are either closed or do not exist. Another objective was to generate business for restaurants, art and crafts shops, and other businesses in the vicinity of points of interest (POIs).</p> <p>The project was conducted by Umeå Municipality and was funded by Umeå, Robertsfors, Skellefteå and Piteå municipalities and the regional authorities for Västerbotten and Norrbotten, together with the European Union's Structural Funds. It originated through a study on increasing the region's attractiveness as a tourist destination and economic output from tourism by providing information to visitors about points of interest (POIs).</p> <p>By providing information about additional commercial POIs, such as restaurants and arts & crafts shops, in the vicinity of both existing non-commercial POIs and commercial POIs, more business activity would occur. It was also important that the solution can be used by small destinations, small commercial operations in the tourist industry and by non-profit organizations without them having to pay expensive licensing fees. Small financial resources should not prevent anyone from creating their own guide. Low costs for creating and running a guide would also make it financially viable to create guides for smaller target groups that could be a significant target group for a small actor. For the "Tourist bureau workload" dimension, a cost-effective solution was important, especially regarding the cost of maintaining and running the guide after the system development phase. To limit additional workload on the tourist bureaus or destination companies, it was crucial that the existing information about POIs in current the systems for official web pages could be re-used in the mobile guide. It was also important that the solution did not involve any hardware that must be sold, lent or rented from the tourist bureaus or destination companies since the level of wear and tear is high and this generates cost.</p>

	<p>The reason for choosing a web application was mainly the cost of future maintenance of the application. For a non-web application to work for most mobile phones requires maintaining multiple versions of the code. Many small tourist bureaus or destination companies have small budgets but might have access to people who have knowledge about IT. Since this guide is available free of charge and will be very cheap to adapt and run due to the lack of licensing costs, any interested party that has knowledge but lacks financial resources will be able to act thanks to the use of OSS.</p> <p>By using open source software, much of the basic functionality is already created by someone else. We can focus on adding functions that increase value explicitly to visitors/tourists. We can also take advantage of the on-going development of "Joomla". We have used an agile developing method with frequent releases made operational, each iteration adding to the functionality in the previous version.</p>					
Duration / Preparation	Date/Year	15.10.2008	Person months	24-46	Staff preparation	N/A
Implementation	Internal / External		Mostly by external consultants	Est. cost	100.000 – 499.000 €	
Software components / licenses	<p>MobiView and MobiVisit: templates for Joomla designed to fit the screen of most smartphones and tablets on the market.</p> <p>MobiMaps: a plug-in that shows POIs on a scrollable map in which different layers can be activated/deactivated and geo-tagged images from Flickr can be retrieved.</p> <p>MoreInfo: a small plug-in that provides contact information and other information connected to POIs.</p> <p>MobiRate: a component that provides functionality for the visitor to rate and comment on the performance/quality of POIs.</p> <p>MobiShare a plug-in that connects the Mobile Guide to Facebook and Twitter, making it easy to switch to that system for commenting on POIs.</p> <p>MobiForms: a component that provides functionality for the visitor to answer questions in the form of a survey or a competition. The guide also has functions for importing information about POIs from Tellus and a function for initiating a telephone call to a predefined number by touching an icon. The latter function is used to provide an "audio guide" by directing the call to an answering machine with a recorded message containing information about the POI. We have avoided using JavaScript in the code we developed. Some phones do not support JavaScript and some users have disabled JavaScript on their phones due to security concerns. The webpages generated with the code created by the project complies to W3C Standards XHTML Mobile Profile v1.2 and CSS Level 2.1.</p> <p>Licenses used: GPL V2</p>					
Source code / documentation	Source code modification	Yes	Documentation languages		Swedish	

Main results /achieved objectives	<ul style="list-style-type: none"> enhancement of the quality of visitor experience in “Quality of the experience for the visitor” in Umeå 				
2.2.1. FREEBSD - Firewall solution, Vysocina, CZ					
Title	FreeBSD Firewall solution, Vysocina Region <ul style="list-style-type: none"> cost reduction improvement of organisation processes 				
Organisation	Vysocina Region				
Description Perspectives	External firewall to shield the local network from the Internet. The firewall was enabled packet filter, which is to prevent attacks from the Internet and to shield the local network. In operation. To be expanded or replicated.				
Contact / info	solutions were stored in the Firewall log for later analysis. Firewall has 8 interfaces - 1Gbit, Thomas Kvist, thomas.kvist@umea.se				
Duration / Preparation	Date/Year	Person months	Est. cost	Staff preparation	Yes
	01.01.2005	6	1 – 14.999 €		
Implementation	Internal / External	Mostly in-house		Est. cost	1 – 14.999 €
Software components / licenses	FreeBSD, Mysql, Packet filter. FreeBSD License				
Source code / documentation	Source code modification	No	Documentation languages	Czech, English	
Main results /achieved objectives	<ul style="list-style-type: none"> Improvement of performance and effectiveness of the organisation Strategic independence from vendor lock-ins Cost reduction Facilitation of the exchange of data and shared development strategies Stable solution not subject to commercial pressures. 				
Perspectives	In operation. To be retained / sustained.				
Contact / info	Jaroslav Krotký vysocinaB1@bestpractices.osepa.eu				

2.2.2. Promox Server Virtualisation Platform, Valmiera City Council, LV

Title	Promox Server Virtualisation Platform, Valmiera City Council, LV					
Organisation	Valmiera City Council, LV					
Description	The decision to move our virtualisation platform to Proxmox was taken by the IT manager at Valmiera City Council considering Proxmox as the ultimate hypervisor (it runs two types of hypervisors on one physical server). Server virtualisation before was also done using open source tools. The migration from the old solution to the new was done online, no real downtime of services occurred. Another good factor for Proxmox is that it is really easy to setup and has all necessary documentation. If we are speaking about the alternatives, there are none that provide this level of functionality. From the moment, we started using Proxmox, we have never thought about changing the hypervisor! We have also managed to migrate physical MS Windows servers into this solution. It gives us a really good level of service.					
Duration / Preparation	Date/Year	15.04.2010 – 15.05.2010	Person months	1-6	Staff preparation	No
Implementation	Internal / External		Practice has been mostly implemented by external associates or contractors.	Est. cost	a. 1 – 14.999 €	
Software components / licenses	The solution is used under it's original licence.					
Source code / documentation	Source code modification		No	Documentation languages		English
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendors lock-in • Reduction of procurement (licensing) cost • Enhancement of performance and effectiveness of the IT system • Optimisation/ Simplification of organisation processes • Simplification of client and / or server architecture 					
Perspectives	The solution was implemented in 2010 and is still in operation. It is expected to be expanded or replicated.					
Contact / info	Zane Duze: zane.duze@lps.lv http://www.valmiera.lv/en					

2.2.3. Pfsense firewall solution, Extremadura Region, ES						
Title	Pfsense firewall solution, Extremadura Region, ES					
Organisation	Extremadura Region, ES					
Description	<p>In the organisation we have a growing demand from users who have requested, among other things, to have access to information from outside the organisation, enable and provide access to those attending the meetings within the organisation, etc. For the staff this meant a number of drawbacks especially in ensuring the security problem and finding a comprehensive tool that would not require the use different applications for each solution adopted. After several weeks of research and investigation we found the solution to better meet user needs while also not losing data integrity through certain measures of computer security and access control. The solution was pfSense. PfSense is a distribution which is derived from BSD Unix that serves as Firewall, Captive Portal, VPN server, DDNS, DHCP, among others. PfSense is an open source security solution meaning that any developer can add improvements to the OS under certain conditions. We chose pfSense because its development model is open source, the core is based on the free operating system called BSD and its core-type of pfSense is monolithic.</p>					
Duration / Preparation	Date/Year	13.06.2011 – 18.07.2011	Person months	1-6	Staff preparation	No
Implementation	Internal / External		Mostly in-house	Est. cost	a. 1 – 14.999 €	
Software components / licenses	PfSense is an application that is installed as an operating system because it has several features such as: Firewall, VPN Server, Load Balancing, Captive Portal, State table, DNS cache, DHCP server, PPPoE server, Static Routing, Redundancy, Reporting and Monitoring. PfSense source code is released under the BSD license.					
Source code / documentation	Source code modification		No	Documentation languages		English
Main results /achieved objectives	<ul style="list-style-type: none"> • Optimisation/ Simplification of organisation processes • Facilitation of the exchange of data and shared development strategies • Facilitation of the exchange of data and shared development strategies • Enhancement of system security • Strengthening of data security 					
Perspectives	To be retained/ sustained					
Contact / info	Gustavo A. gustavo@fundecyt.es http://www.pfsense.org/					

2.2.4. Bacula Open Source Network Backup Solution, Extremadura, ES

Title	Bacula Open Source Network Backup Solution, Extremadura, ES					
Organisation	Foundation for the Development of Science and Technology in Extremadura / FUNDECYT.					
Description	<p>In our role as system administrators, there is always a task that is tedious but at the same time is the most important for the safeguard of our information: data backup. Data backup is undoubtedly a vital role to recover our information when a problem occurs, either hardware or software, for which, it is important to have appropriate policies and tools for this activity. Basically, an application is network-based backup. Its structure is ideal for maintaining support from different computers (clients) with a centralised control server (director), and other data storage (storage). Bacula stores the list of jobs, files and volumes associated in a database. Bacula can backup data stored in different types of media such as tape drives or hard drive. The disk backup can be on a directory or directly on the raw partition. Restoring Files: the goal of maintaining a backup is to recover and restore data as quickly as possible. This task becomes trivial from Bacula, all that is required is to have properly configured the demons and keep on hand bconsole command. Conclusion: Bacula is a great tool to keep track of automated backup of a network by adding very little burden on customers and maintaining centralised control. In our view, it is one of those tools that all system administrators should consider essential. The major complication is the huge amount of options and the learning curve involved. But once understood, it can really save you from many disasters, and save time in system restoration. As a final comment, it should be stressed that it is very important to have backup policies and retention of well-defined data to maximise our resources.</p>					
Duration / Preparation	Date/Year	15.09.2010 – 15.10.2010	Person months	1-6	Staff preparation	No
Implementation	Internal / External		Implemented mostly in-house	Est. cost	1 – 14.999 €	
Software components / licenses	<p>Bacula is a set of computer programs that permits the system administrator to manage backup, recovery, and verification of computer data across a network of computers of different kinds. Bacula can also run entirely upon a single computer and can backup to various types of media, including tape and disk. Bacula is made up of the following five major components or services: Director, Console, File, Storage, and Monitor services.</p> <p>There are a number of different licenses that are used in Bacula. GPL: The vast bulk of the source code is released under the GNU General Public License version 2. Portions may be copyrighted by other people. These files are released under different licenses which are compatible with the Bacula GPLv2 license. LGPL: Some of the Bacula library source code is released under the GNU Lesser General Public License. This permits third parties to use these parts of our code in their proprietary programs to interface to Bacula. Public Domain: Some of the Bacula code, or code referenced in Bacula, has been released to the public domain. E.g. md5.c, SQLite.</p>					
Source code / documentation	Source code modification		No	Documentation languages		English, Spanish
Main results /achieved objectives	<ul style="list-style-type: none"> • Simplification of client and / or server architecture • Enhancement of system security • Strengthening of data security 					
Perspectives	To be retained/ sustained					
Contact / info	<p>Nicolas Lopez de Lerma: nicolas@esdebian.org</p> <p>http://www.bacula.org/en/</p>					

2.2.5. Open source online survey tool, University of Sheffield, UK						
Title	Open source online survey tool, University of Sheffield, UK					
Organisation	University of Sheffield, UK					
Description	LimeSurvey online survey software was used to conduct a survey across 20 European countries targeting 12 thousand respondents.					
Duration / Preparation	Date/Year	01.08.2011 – 01.09.2011	Person months	1-6	Staff preparation	No
Implementation	Internal / External		Both by internal staff and by external associates	Est. cost	1 – 14.999 €	
Software components / licenses	N/A					
Source code / documentation	Source code modification		No	Documentation languages		English
Main results /achieved objectives	<ul style="list-style-type: none"> • Reduction of procurement (licensing) cost • Facilitation of the exchange of data and shared development strategies 					
Perspectives	“This was a successful implementation of a survey targeting large numbers of respondents in a number of countries. We would recommend this solution for subsequent surveys”.					
Contact / info	Andrea Corbett: ufsd01@osepa.eu www.osepa.eu					

4.6. E-government / public service platforms

4.6.1. PloneGov, IT	
Title	PloneGov
Organisation	Nationwide project
Description	<p>PloneGov (http://www.plonegov.org), a multi-awarded world wide initiative, -a finalist at the European e-Government awards, is perhaps one of the most successful cases in collaborative software ecosystems for the Public Sector. With subcommunities in four continents and 20 countries, among which the Italian sub-community PloneGov Italia (http://www.plonegov.it), PloneGov proved capable to unite the efforts and the experience of Public Organizations, cities and local governments faced with the same situations and challenges in terms of e-government.</p> <p>All the participant organisations share a common technology, the free CMS Plone, world noted as the most complete and versatile software framework to build Web portals and Intranets, as well as application software including document and workflow management, and capable to integrate with third-party services (like those from Google), as well as of providing more than a thousand free add-ons for specific uses including newsletters, forum, multimedia, "Web 2.0" interactivity, surveys, online forms and many more. PloneGov provides both a software repository for sharing several different solutions based on Plone, and a mind pool where any organization from the Public Sector can offer or receive - for free - reusable Plone solutions, expertise and know how from the very same people that designed and developed those best-practice solutions, fit for the public sector.</p> <p>PloneGov takes advantage of the technical support by ZEA Partners, a global network of SMBs, available when needed. Thanks to this support and to the active involvement of both the PloneGov member organizations and of the SMBs in the Plone community, PloneGov is constantly growing along with the number of solutions available. Plone SMBs may help even the smallest organizations willing to engage in reuse, a good practice usually precluded to those lacking an internal IT staff. Based on a powerful, enterprise Content Management System, the PloneGov initiative can: include groups at risk of exclusion in eGovernment practices; improve user segmentation in eGovernment services; provide invaluable experiences, like those from the awarded best practice, Health Atlas Ireland, for inclusive eGovernment in healthcare; provide multichannel delivery services and eGovernment services at the different levels of the value chain; give autonomy to public organisations in all the lifecycle of design, production, delivery, access and use of inclusive eGovernment services; boast an "Inclusive by design" approach, thanks to an architecture designed for accessibility by users, including those sensorially impaired, and for crawlability by search engine spiders; leverage on Plone to market, target and promote eGovernment services for specific disadvantaged groups.</p> <p>Initiated by small towns, PloneGov is open to all type of collaborations. It already reaches cities, regions, parliaments and administrations. Truly international, the project spans over 4</p>

	<p>continents and reaches 20 countries. PloneGov success results from a close collaboration between public organisations, open source communities and Zea Partners, an international non-profit network for companies building open source solutions, with registered office in Ferrara, Italy. Compared with other PloneGov subcommunities, PloneGov Italia is both the most lively and the one encompassing the highest diversity of organizations, making it a scaled-down version of the PloneGov global initiative. In Italy, the diffusion of Plone and the success of PloneGov Italia were favored by the advanced Italian Laws encouraging the reuse of software among Public Organisations. Adopters from the Public Sector felt encouraged, and the availability of technical support from several SMBs providing installation, customization and training services, put the Italian Public Sector in the condition of adopting Plone in a variety of niches. Among the key users of Plone in Italy, is the Emilia Romagna Region. A Plone solution from Emilia Romagna, the “Youth Information Portal”, was selected by the Ministry of Youth for national adoption.</p>					
Duration / Preparation	Date/Year	01.01.2008	Person months	>36	Staff preparation	Yes
Implementation	Internal / External		Both in-house and externally	Est. cost	N/A	
Software components / licences	<p>Whole CMS-based solutions, including institutional web Portals, intranets, web applications. Furthermore, thanks to the modular nature of Plone, based on the Python language, hundreds of add-ons ("Plone products") are available on http://pypi.python.org/pypi?%3Aaction=search&term=plone&submit=search and on http://plone.org/products. Besides customizing their Plone installation with these products, many public organizations in Italy developed their own new products and often released them for public reuse. At Intranet level, complex document-management and process-management solutions were developed, including http://plone.org/support/case-studies/quasar-scrivania-virtuale</p> <p>Licences used: Plone itself is released under the GNU General Public License (GPL) version 2. The adoption of EUPL license is under discussion within PloneGov Italia. EUPL can be implemented with non-conflicting additional clauses that may include the obligation to release any derivative work to the PloneGov Italia community.</p>					
Source code / documentation	Source code modification	Yes	Documentation languages		English, Italian and all languages natively supported by Plone.	
Main results /achieved objectives	<ul style="list-style-type: none"> • Compliance with laws about software reuse in the Public Sector • Compliance with the laws about website accessibility • Improvement of performance and effectiveness of the organisation • Strategic independence from vendors lock-in • Reduction of procurement (licensing) cost • Strengthening of data security 					
Perspectives	In operation. To be expanded/ enhanced/ replicated					
Contact / info	Cesare Brizio cesare@zeapartners.org					

4.6.2. OTRS ticketing system, Bologna, IT						
Title	OTRS ticketing system, Municipality of Bologna					
Organisation	Municipality of Bologna					
Description	Using OTRS, a ticketing system has been created to handle end user requests. OTRS has been heavily customized to integrate with LDAP, mail and web services to transfer ticket to external support. Now we handle about 20 queues ranging from HW problems to application problems. Queues are assigned to different groups to solve problems.					
Duration / Preparation	Date/Year	01.08.2007	Person months	6-12	Staff preparation	Yes
Implementation	Internal / External	both in-house and externally		Est. cost	15.000 – 49.000 €	
Software components / licenses	Asterisk PBX, AstBoxLinux, Mysql, PHP, Apache GNU General Public License					
Source code / documentation	Source code modification	No	Documentation languages	Italian		
Main results /achieved objectives	<ul style="list-style-type: none"> • Enhancement of performance and effectiveness of the IT system • Optimization of organisation processes • Cost reduction 					
Perspectives	In operation. To be retained / sustained					
Contact / info	Laura Badini laura.badini@comune.bologna.it					

4.6.3. Electronic Systems for Vending Machines - Codes service Provision (E-CODES), GR						
Title	Electronic Systems for Vending Machines - Codes service Provision (E – CODES)					
Organisation	Region of Western Greece					
Description	<p>The solution intended to manage geographically propagated vending machines, however it can be transferred to Public Administrators for example to control parkings, parking meters, tourist kiosks, etc. The solution is currently used to control more than 50 vending machines in the wider area of Western Greece Region. The system is able to manage propagated geographically vending machines that provide specific services. These vending machines (via their equipment) fulfil specific services to the citizens (such as provision of theater tickets, vending cards for mobile telephones). In order to keep the cost for the whole system in acceptable levels (since the number of vending machines increases rapidly), an open source operating system (Debian-Linux) was selected for the vending machines. Moreover, it is worth mentioning that the installed version in the vending machines was Debian Stable Netinst (base installation) with the addition of several packages for desktop environments (Xserver, Fluxbox, etc.). This version was selected in order to reduce the installation space (running from a memory card of 1GByte). All the unnecessary packages were removed from the basic installation. The installation space was finally reduced to 380-400 MBs. Among others, Debian Linux was selected for the following advantages: upgradability, cost-efficient (it's free), bug tracking system, small size of distribution. The user interface in the vending machines was implemented using Mozilla Firefox. R-kiosk extension was used that defaults to full screen, disables all menus, toolbars, key commands and right button menus. This extension could prevent end-users from exiting the application and possibly damage the operation of the vending machines. The system was designed in order to ensure the security and record all running operations. All the distributed information from and towards the vending machines is stored in a data base created in MySQL. The operations executed in the data base include the management and registration of all the terminals that belong to the system, monthly recording of the provided services, monitoring of the terminals with diagnostic tools, storage the information. In order to manage the information and stored data the system uses phpMyAdmin.</p>					
Duration / Preparation	Date/Year	03.2003 – 12.2004	Person months	24-36	Staff preparation	Yes
Implementation	Internal / External	Mostly implemented by external associates or contractors		Est. cost	15k – 49k €	
Software components / licenses	<p>The vending machines and the central servers do not use any proprietary software components. The only proprietary software necessary were the drivers for the corresponding peripheral devices (such as printer and touch screen).</p> <p>Debian-Linux operating system (http://www.debian.org/index.en.html), - Mozilla Firefox for the user interface (http://www.mozilla-europe.org/en/firefox/), - R-kiosk extension (https://addons.mozilla.org/en-US/firefox/addon/1659/), - MySQL for system database</p>					

	(http://www.mysql.com/), - phpMyAdmin for database management (http://www.phpmyadmin.net/home_page/index.php).			
Source code / documentation	Source code modification	Yes	Documentation languages	Greek
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendors lock – in • Optimisation/ simplification of organisation processes • Minimisation of need for technical support 			
Perspectives	E - CODES system is nowadays in operation and the perspective for the next years is to be enhanced, expanded or replicated. The system is operating at the moment and controls more than 50 vending machines. With minimal changes it may be used by local or regional public administrations.			
Contact / info	Vasileios Kokkinos: kokkinos@upatras.gr			

4.7. Education / e-learning platforms

4.7.1. MOODLE: e – learning software platform, CY						
Title	MOODLE: e – learning software platform					
Organisation	University of Cyprus, Computer Science Department, Nicosia, Cyprus					
Description	<p>In July 2008 the IT department, responsible for the development and support of software application within the Computer Science department of the University of Cyprus, took the decision to adopt the MOODLE platform as an alternative to the proprietary course management system previously used, <i>blackboard</i>. MOODLE (Modular Object-Oriented Dynamic Learning Environment) is a free and open-source e-learning software platform, belonging to the Content Management Systems (CMS). The adoption of MOODLE was overall successful, as <i>“there weren't any problems during the adoption of the software and not any migration was needed. No legal issues were arisen at the time.”</i></p>					
Duration / Preparation	Date/Year	2008	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External		Mostly in-house	Est. cost	1 – 14.999 €	
Software components / licenses	The open source components used were Linux server, Apache web server and MySQL database. The source code of MOODLE was not modified. No proprietary software component was used. MOODLE is released under GPL license.					
Source code / documentation	Source code modification	No	Documentation languages		English	
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendors lock-in • Reduction of procurement/ licensing costs • Minimisation of the need for technical support 					
Perspectives	MOODLE is nowadays in operation and the perspective for the next years is to be enhanced, expanded or replicated.					
Contact / info	Mr. Nicos Kyriakides, knicos@gmail.com www.moodle.org					

4.7.2. Adoption of OpenOffice, Ubuntu LTSP and Samba server by Swedish schools in Vindeln, SE						
Title	Adoption of OpenOffice, Ubuntu LTSP (Linux Terminal Server Project) and Samba server by Swedish schools in Vindeln municipality					
Organisation	Vindeln Municipality, Västerbotten, Sweden					
Description	In 2008 the civil service organization of Vindeln municipality took the decision that the schools of the municipality would migrate to OSS. After eight months of study (August 2006), the migration was implemented. The implementation lasted for eight months and only a few person months (1 to 6) were invested from the internal resources of the municipality during the implementation phase. Before the decision was taken, tests were made and requirements were identified from the schools.					
Duration / Preparation	Date/Year	2008	Person months	1-6	Staff preparation	
Implementation	Internal / External	Yes		Est. cost	1 – 15k €.	
Software components / licenses	The open source components used by the schools in Vindeln municipality are Open Office, Ubuntu LTSP server installation - by secondary schools - and Samba server as a file server. Also the DNS (Domain Name System) server of schools is based on open source software.					
Source code / documentation	Source code modification	No	Documentation languages	Swedish		
Main results /achieved objectives	<ul style="list-style-type: none"> • Strategic independence from vendors lock-in • Reduction of procurement (licensing) costs 					
Perspectives	The OSS applications are still in use by the schools of Vindeln municipality.					
Contact / info	Mr. Lars Eriksson, lars.eriksson@vindeln.se www.vindeln.se					

4.7.3. Fosie Edubuntu in Malmö, SE

Title	Fosie Edubuntu in Malmö City, SE					
Organisation	Malmö City, SE					
Description	<p>Edubuntu 10.04 "Fosie Distro" is an Edubuntu distribution specially made for young children learning in collaboration with teachers.</p> <p>The solution has been deployed in cooperation with teachers with the aim of finding a stable, flexible, easily manageable learning solution for young children also aiming to be a sustainable solution for reusing computers not strong enough for other complex proprietary software use. It is also a learning project that has had an evolutionary growth as more teachers can handle the technology themselves.</p>					
Duration / Preparation	Date/Year	15.03.2007	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External		Mostly in-house	Est. cost	1 – 14.999 €	
Software components / licenses	<p>The Fosie Edubuntu is based on Ubuntu applications and distributed on DVD and can be downloaded from http://ubuntuone.com/p/17bf/ as an iso file for anyone to try and install. Wine windows emulator, Sugar software, Clonezilla, VVoice Synteziser, Novo software.</p>					
Source code / documentation	Source code modification	No	Documentation languages		Swedish, English and all languages natively supported by Ubuntu/Edubuntu	
Main results /achieved objectives	<ul style="list-style-type: none"> • increased sustainability as we can use hardware better and longer with smarter software • cost efficiency and increased sustainability for educational use • minimized need for technical support • strategic independence from vendor lock-in • improvement of performance and effectiveness of the organisation 					
Perspectives	In operation. To be expanded/ enhanced/ replicated.					
Contact / info	<p>Staffan Hessel staffan.hessel@gmail.com</p> <p>www.fosienet.se (in Swedish)</p> <p>Short article in English: http://www.wideminds.eu/cms/index.php?option=com_content&view=article&id=307:linux-for-kids-the-edubuntu-project&catid=45:bestpractice&Itemid=69</p>					

4.7.4. E-gnosi: open source course management system that supports asynchronous eLearning services, GR

Title	E-gnosi: Open source and complete Course Management System that supports Asynchronous eLearning Services					
Organisation	PETA S.A., CTI-Diophantus, GR					
Description	The e-gnosi platform is based on OPENeCLASS platform (http://www.openecclass.org). OPENeCLASS, is based on the philosophy of open source code, it is actively supported by GUNet and is freely distributed (under GNU GPL license). For the installation of OPENeCLASS platform the following applications may be required: Apache, MySQL, PHP, XAMPP, LAMP, WAMPP, EasyPHP, phpMyAdmin. In detail, the e-gnosi platform is a complete Course Management System that supports Asynchronous eLearning Services via a simple web browser. Its goal is the incorporation and constructive use of the Internet and web technologies in the teaching and learning process. It supports the electronic management, storage and presentation of teaching materials, independently of the spatial and time limiting factors of conventional teaching and creating the necessary conditions for a dynamic teaching environment. The introduction of eLearning into the traditional teaching process provides new capabilities and allows new means of interaction between students and teachers, through a contemporary technological peak environment.					
Duration / Preparation	Date/Year	01.01.2009 - 01.05.2009	Person months	1-6	Staff preparation	Yes
Implementation	Internal / External	Implemented by both internal staff and external associates or contractors.		Est. cost	1 – 14.999 €	
Software components / licenses	The e-gnosi platform is based on OPENeCLASS platform (http://www.openecclass.org). OPENeCLASS, is based on the philosophy of open source code, it is actively supported by GUNet and is freely distributed (under GNU GPL license). For the installation of OPENeCLASS platform the following applications may be required: Apache, MySQL, PHP, XAMPP, LAMP, WAMPP, EasyPHP, phpMyAdmin.					
Source code / documentation	Source code modification	No	Documentation languages	Greek		
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendors lock-in • Reduction of procurement (licensing) cost • Optimisation/ Simplification of organisation processes 					
Perspectives	The implemented solution is in operation and several users already use the Openecclass platform.					
Contact / info	Vasileios Kokkinos: bill_kokkinos@hotmail.com http://egnosi.info-peta.gr/ http://www.openecclass.org/					

4.8. Geographic Information Systems (GIS)

4.8.1. Geographic Information System (GIS) Schoten, BE						
Title	Geographic Information System (GIS) for viewing, querying and editing of geographic data in a GIS-Viewer on a client computer.					
Organisation	City of Schoten, Belgium					
Description	In 2006 the City of Schoten took the decision to adopt a GIS Manager in order to set up a GIS system in the whole municipality of Schoten. The implementation of the GIS system derived from the need to organise and administer the available geographic data in a common system, which could be used by each municipality in Flanders. The criteria for selecting between the available solutions were the cost of implementation and of maintenance for the next five years, the quality, the interoperability, the knowledge transfer and the previous experience with OSS. The study phase lasted for eight months. The implementation of the selected OSS solution started in early 2007 and completed within half a year.					
Duration / Preparation	Date/Year	2007	Person months	6-12	Staff preparation	Yes
Implementation	Internal / External		Mostly external	Est. cost	50k – 99k €	
Software components / licenses	Firstly, the various geographic data were imported in a PostGIS database, which is a component of PostgreSQL. Then, a geoserver was used so as to provide access to the geographic data. The geoserver uses OGC-standards (Open Geospatial Consortium): the WMS (Web Map Service) in order to produce maps from vector and raster data and the WFS (Web Feature Service) to show attribute information from vector data in the viewer. Multiple geoportals can be consulted in GIM WebGIS. GIM WebGIS is a CMS (Content Management System) where the GIS Manager configures the required parameters and data and the end-users view detailed maps. With GIM WebGIS the GIS Manager can make geoportals. In a geoportal, data belonging to a specific theme can be grouped (planning, environment, cemetery, addresses, etc). The GIS Manager can create as much geoportals as it is required. The GIS Manager administers and decides about the rights of the users regarding their access to geoportals. The aforementioned OSS components run on a server with Linux CentOS as operating system. All vector data are stored in a PostGIS database. Raster data are stored in files on the geoserver. The only (partially) proprietary software used was GIM WebGIS. The source code of the OSS components which have been used was not modified and the GPL (General Public License) license was granted for the implementation of the GIS system.					
Source code / documentation	Source code modification		No	Documentation languages		English, Dutch, French
Main results /achieved objectives	<ul style="list-style-type: none"> • Improvement of performance and effectiveness of the organisation • Strategic independence from vendors lock-in • Optimisation of organisation processes • Strengthening of data security • Software interoperability 					
Perspectives	The GIS system implemented by the City of Schoten is nowadays in operation and the perspective for the next years is to be enhanced, expanded or replicated.					
Contact / info	Mr. Steven Vermeir, steven.vermeir@schoten.be http://geoserver.org , http://postgis.refractions.net/ , http://www.gim.be					