



Report on the
International Status
of Open Source
Software 2010



Report on the International Status of Open Source Software 2010

National Open Source
Software Observatory



www.cenatic.es

Created by:

The CENATIC Team. National Open Source Competency Centre. National Open Source Software Observatory (ONSFA).

Penteo ICT Analyst

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Prologue

Information and communication technologies, hereafter ICTs, play a key role as a basic element of competitiveness, promoters of innovation and key factors in the knowledge society. Nowadays, more than half of the increase in productivity in Europe is generated by ICTs, not only in terms of the investment they represent, but also as an agent directly involved in improving the efficiency of the remaining economic sectors.

ICTs will continue to be a driving force in our economies in the future. We are still at an early stage in the exploitation of all the possibilities they currently offer, but we can already glimpse some elements that will become opportunities for growth. One of these elements is the extraordinary generalization of ICTs, which makes them accessible to any user, rather than being limited to experts. As a result, users can simultaneously benefit from them and play an active role in them. Moreover, there is the already-existing trend of exploiting the potential of cloud computing and social networks, as well as the application of collective intelligence provided by crowdsourcing, a term coined by Jeff Howe in 2006, according to which collective mass participation in development projects generates better ideas and more innovative products.

Finally, these developments will be characterised by interoperability. This will allow systems and applications to form a transparent service network over which knowledge can easily spread and be used in ways that are still difficult for us to foresee.

Interoperability, crowdsourcing, collective intelligence, generalisation, cloud computing and social networks... All these concepts are closely related to collective construction, the distinguishing feature of Open Source Software, that results in development sharing among companies, administrations and citizens all over the world, as well as transparency, efficiency and technological independence. The impact of Open Source Software on our society continues to grow, and it is one of the values of the Network Society. Open technologies are already part of the technological reality for citizens, companies and the public administration, as their benefits have led to them being chosen as a result of conscious and thorough selection processes.

The CENATIC Foundation, in keeping with its objective of raising awareness about open source technologies, regularly releases research reports that study the different aspects of open source software. The ultimate aim of these reports is to boost the competitiveness of the Spanish business sector by providing information about the business opportunities offered by these technologies and identifying international projects that can be implemented and applied to Spanish society.

The report we present here analyses the International Status of Open Source Software, enabling us to put the current situation in Spain in context based on the knowledge of technology trends around the world, the promotion and use of open technologies in the Spanish Private and Public sectors, and the contribution of Spanish Communities of Developers and Universities to important initiatives on an international scale.

It is, in conclusion, a thorough overview of the international context of open source software, creating a starting point for the identification of new business opportunities for Spanish companies, and new fields of study for CENATIC to continue promoting the use and development of open source software in Spain.

Francisco Ros Perán

Secretary of State for Telecommunications and the Information Society

President of CENATIC Board of Trustees



Introduction to the Report

Within the framework of CENATIC's regular publications for the dissemination and promotion of open source software in Spain, we present this report, "The International Status of Open Source Software," which offers an overview of the open source software situation in different geographical areas around the world.

The objective of this report is to understand the role played by open source software in the Information and Communications Technologies sector around the world, and to highlight its economic and social impact, on both advanced economies and emerging countries, by analysing the ecosystems that foster the development of open source software: the Public sector, the Private sector, Universities and Communities of Developers.

The result of this analysis is the identification of the factors that account for the differences in maturity and penetration of open source software in the different geographical regions. Among these factors, we must highlight the key role of Public Administrations in promoting open source software, both by developing policies to promote and encourage its use and by becoming a key user of this software, as happens in those European countries most advanced in the use and development of free technologies. Other factors that explain the different maturity levels among countries are the level of education and the access their citizens have to the information society. In this regard, as a result of its high level of technical training, India shows a high level of open source software development, despite the limited access the general population has to the information society.

Each geographical area has been characterized according to the level of maturity shown by the most relevant countries in the region, and this level has been established through a detailed analysis of the elements of each country's ecosystem. North America, Western Europe and Australia stand out as the most advanced regions, whereas the whole of Asia, Latin America and Africa show a lower level of development. Aside from these two groups, worth mentioning is the special position held by several of the most advanced Asian countries such as Japan, Korea, China and India, as well as Brazil in Latin America and South Africa in Africa, which stand out when compared to the rest of the countries in their region.

The analysis of the different initiatives taking place in these countries has also allowed us to observe the evolution of the operational model for the communities of developers inherent in open source software.

At the CENATIC Foundation, we hope that this report will contribute to the dissemination of the main initiatives implemented worldwide for the development of open source software. These initiatives will assist the different economic agents in finding new opportunities for the development of open source software in Spain.

Miguel Jaque Barbero
Managing Director of CENATIC

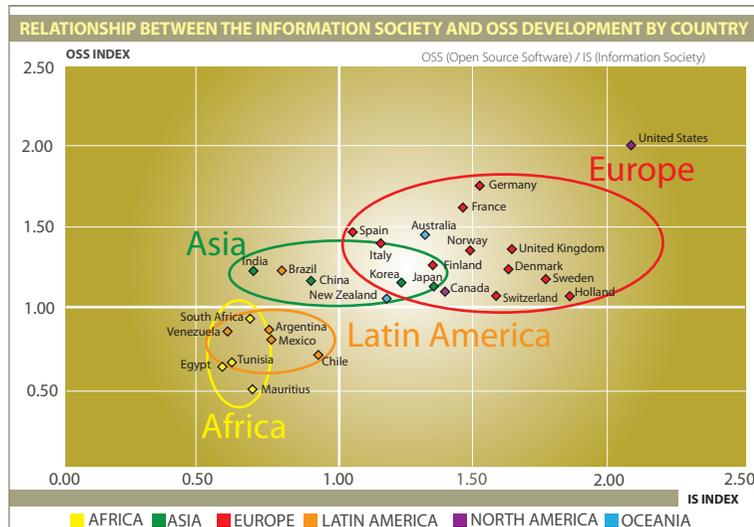


01

01 . Executive summary

1.1. Overview of the extent of Open Source Software development around the world.

The extent to which open source software (OSS) has been adopted and developed varies a great deal among the different geographical regions of the world, and this variability is correlated with the degree to which the information society (IS) has developed.



Countries with the strongest economies demonstrate a high level of both IS and the use of OSS. North America, Western Europe and Australia belong to this category. Africa, Latin America and Eastern Europe are found at the opposite end of the spectrum, with their countries registering low IS and OSS development indices.

The United States, Australia and the Western European countries lead the development and adoption of open source software.

The level of OSS adoption and development in India, China and Brazil is higher than expected, considering their level of IS advancement.

In North America, the United States stands out as the world's leading Information Society, in both the public and private sectors. This is to be expected from a country that is home to both the large multinational software companies (IBM, Microsoft, Sun Microsystems, Oracle, etc.), including those from the new generation that sprang up with the Internet (Google, Yahoo, etc.), and the world's most prominent OSS distribution companies (Sun Microsystem, Red Hat, Novell, etc.), and whose universities have made an indisputable contribution to the creation and development of OSS.

The United States, Australia and the Western European countries are the leaders in the development and adoption of OSS.

The level of OSS adoption and development in India, China and Brazil is higher than expected, considering their level of IS advancement.

In the public sector, Europe has experienced greater penetration. Germany, France and Spain lead Europe in the adoption of OSS. Government support for OSS adoption has been key, although different instruments have been used to implement policies. The German Government has launched policies promoting and supporting OSS, and the French Government has centralised the promotion of OSS implementation within the Administration and public companies. Meanwhile, the adoption of policies promoting open source software in Spain has largely been the responsibility of the Autonomous Communities, which have developed initiatives in this area, working under a clear policy framework established by the Ministry of Industry, Tourism and Trade and by the Ministry of the Presidency.

Surprisingly, more advanced Information Society countries such as the Nordic countries, the United Kingdom and the Netherlands show a lower degree of OSS development. The key difference appears to be the lack of support given to open source software in the early stages by their respective governments. Recent legislation and policies promoting the adoption of open standards and OSS enacted by these countries over the last few years will undoubtedly make it possible for them to close the gap with the leading countries.

We must also consider the supporting and harmonising role of the European institutions, which are contributing to the promotion of the Information and Communications Technologies (ICTs) sector, and within this area, to the promotion of OSS, as one of the key driving forces in the European sector. Similarly, under the Seventh Framework Programme for Research and Technological Development, the European Union finances technology-related projects that result in OSS developments, involving various firms and universities from different countries, each contributing different skills¹.

¹ Chapter 4 provides a brief description of the most important OSS projects within this framework programme, with an emphasis on the universities and companies participating.



In the Pacific region, Australia stands out as one of the countries with the highest degree of open source software adoption in the world, thanks to its active communities of OSS developers who participate in international projects. The universities also play a very important role in both training qualified ICT personnel and participating in OSS projects. The Australian business sector spends a significant part of its R&D budget on OSS projects, which results in the country having a large subsector of open source software companies within the ICT sector and in the presence of OSS centres of excellence in the country. This is accompanied by a policy of support by the government, which has encouraged the adoption of OSS by the Public Sector.

The combination of these four factors establishes Australia as the paradigm for OSS development in a country, thanks to a clear balance between the four forces: Government, Universities, the Private Business Sector and Communities.

In Asia, we find four countries that are leading the world in open source software, namely India, China, Japan and South Korea, although with very heterogeneous levels of advancement in terms of the Information Society. India is the most atypical country, because in spite of its low IS level, it has attained a significant level of OSS development, largely thanks to the educational level of its population and its involvement in programming for American and European companies. OSS development in China is tightly controlled by the Government, to the point that the main OSS supplier, Red Flag Linux, is partially state-owned.

In Japan and South Korea, the electronics sector has been one of the driving forces behind the development of OSS applications, but it is not the only one. The Korean Government has particularly promoted OSS as a means of boosting and dynamising the country's ICT sector. The presence of a local leading open source software distributor has favoured the adoption of OSS by companies in the private sector, contributing to the growth and maturity of the ICT sector.

China, Japan and Korea all have languages that pose an important barrier to the visibility of their communities abroad, isolating them from the rest of the world. To overcome this isolation, the three countries have formed an alliance to develop a version of Linux for the Asian market, Asianux, with the result that OSS projects are centred around Linux.

The Brazilian Government has managed to foster the development of open source software in all areas of its ecosystem.

In Latin America, Brazil stands out from the rest of the countries in the region due to the greater extent to which it has adopted and developed OSS, with levels comparable to countries such as India and China. This is in spite of the fact that its IS level is similar to that of other large Latin American countries, such as Argentina, Mexico and Chile. The reason can be found in the support the government has managed to provide in all areas of the OSS ecosystem: the publication of regulations, mass migrations in public sector agencies and companies, OSS product development (goods and services) at the public universities and the creation of a collaborative portal for Community players.



The Brazilian Government has managed to foster the development of OSS in all areas of the ecosystem.



Greater user awareness regarding the use of 100% legal software will permit higher rates of open source software use in the future. The lack of supportive policies from Governments and the absence of distributors able to provide the necessary support are the key factors explaining the lower rate of OSS development in Latin America.

Finally, Africa trails the world in the development of Open Source Software and the Information Society, lacking even the minimal means necessary for developing OSS. To this we can add the inexistence of public promotion policies and the high rate of illegitimate software use. Therefore, it is not surprising that only South Africa reaches a value that is anywhere near the worldwide average for the OSS index. Undoubtedly, its economic level, which is clearly superior to the rest of the countries on the continent, along with support from the government and non-governmental organisations, such as the Shuttleworth Foundation, explain South Africa's world ranking in terms of OSS.

This leads us to the observation that countries with a higher level of OSS development and adoption, such as the United States, Australia, Germany, France, Spain and Brazil, each demonstrate high levels of development in all parts of the ecosystem: the Government, Universities, Companies and the Community of Developers.

1.2. The contribution of the Community model to OSS Development and its evolution.

Since Richard Stallman began the GNU/Linux project in 1983, the open source software development model has evolved towards new forms of cooperation revolving around the basic concept of a community of developers.

Most Linux distributions are, to a greater or lesser extent, developed and led by their communities of developers and users. In some cases, they are led and financed completely by the community, as with Debian GNU/Linux, while others rely upon commercial distribution and a version of a community, as we see in the example of RedHat with Fedora or SuSE with OpenSuSE.

There are OSS communities whose members are small, medium or large companies, public administrations, universities and research centres and technology centres. They all share the principle that open source software is an effective strategy for improving the processes of technology research, development and innovation, making it possible to establish viable business models and win-win relationships that promote collaboration.

This evolution has led to the creation of three types of communities: ad-hoc communities that come together for specific projects; foundation communities for large projects that require the formalisation of the community's policies; and communities backed by companies, either individually or through a consortium of several companies, often from different sectors, formed for one specific, common project.

Based on this model of knowledge generation, five business models have been established:

1. Subscription to service-based products: the distribution of software packages with related maintenance services.
2. Value-added services, based on the knowledge generated by the community.
3. Software “as a service”: the client accesses and uses the software remotely, with no need to install it on his own computer. He pays only for his use of the software.
4. Hybrid model: the client has access to certain OSS-licensed software and receives extra features under another license.
5. Cross-selling. Another way to market OSS, along with the rest of the product portfolio.

The community model of OSS development is a global model, with collaboration from players in different countries.

The open source software development model is a globalising model in which players use the Internet to take part in projects in a cooperative environment, regardless of the nationality of the player or the project, and there are no differences between geographical areas, either in terms of the workings of the communities or the associated business models.



The community model of OSS development is a global model, with collaboration from players in different countries.

COMMUNITY OF DEBIAN DEVELOPERS AROUND THE WORLD





02



02 . **Overview** of the extent of Open Source Software development around the world

Overview of the extent of Open Source Software development around the world

This chapter presents an overview of the current Open Source Software (OSS) situation around the world, based on the extent to which users (companies, Public Administrations or individuals) use OSS and the level of development reached by the sector, taking into account the support provided through the policies of the Public Administrations and the existence of companies that market OSS products.

The degree of use and development must be put into context by examining the maturity of the Information Society (IS) in the countries that form the different geographical regions, since this will help to explain the different levels of OSS development.

An Information Society is one in which the creation, distribution and processing of information constitutes an important part of cultural and economic activities; it is seen as the successor to the industrial society. Information Societies emerge as the result of the implementation of Information and Communications Technologies (ICT) in a community. The effectiveness of this technology, which affects such basic elements of a person as speech, memory and learning, in many senses modifies the way in which many activities taking place in modern society can be performed.

According to the study by MERIT-UNISYS, *“Study on the effect of the development of the information society of European public bodies making their own software available as open source,”* which is based on the study of experiences surrounding the implementation of OSS in various Public Administrations in Europe, these initiatives have affected the IS in different ways. The greatest impact is evident when the decision to use open source software is not based on purely technical or

practical reasons, but instead is the result of a clear strategy that aims to affect the development of the IS, such as in the case of Extremadura or Andalusia, in Spain.

As a result, the overview of the extent of OSS development around the world presents country rankings on the basis of their maturity in terms of both the open source software itself, and the Information Society. Considering both dimensions enables us to adequately evaluate the current state of each country and determine its starting point for exploiting the benefits of OSS.

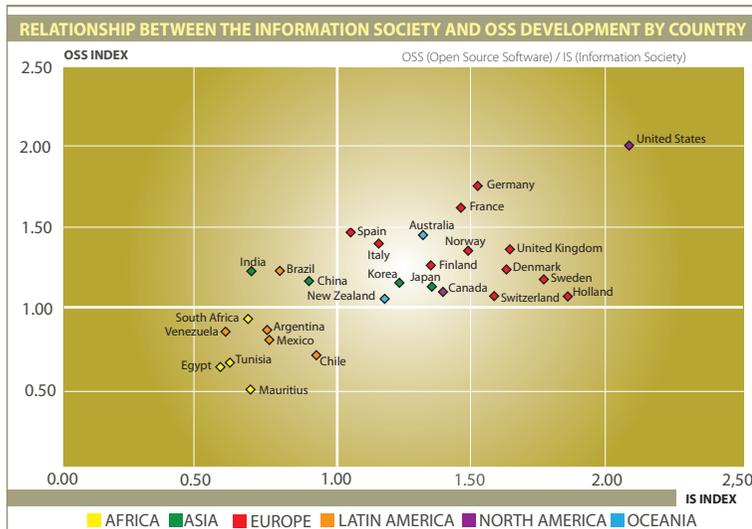
To determine the ranking of each country with regard to these factors, two indices have been created from specific variables that measure not only the degree of advancement of the IS, but also the degree of development of each country in the use of OSS. Each country's score on the index is the result of weighting the deviation from the mean for each variable, using specific weights assigned to each variable¹. In both cases, economic, technological, social, educational and political variables have been considered to create an index which takes into account the influence of these areas on both IS and OSS development. The use of indices allows for an objective comparison among countries.

Looking only at the score obtained by each country for the open source software index, three groups emerge: Advanced Countries, Less-advanced Countries and Developing Countries. Among the countries in the first group are the United States, Germany, France and Spain, with scores that are clearly above average, leading the advancement and development of OSS. In the second group are countries such as Austria, Slovenia and Poland, with around average scores for the use and development of OSS. Finally, the last group contains countries such as Romania, the Ukraine, Greece and Chile, which have clearly below average scores, accompanied by low usage and development of open source software.

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¹ A detailed explanation of the methodology used to create the Open Source Software and Information Society indices can be found in the appendices.

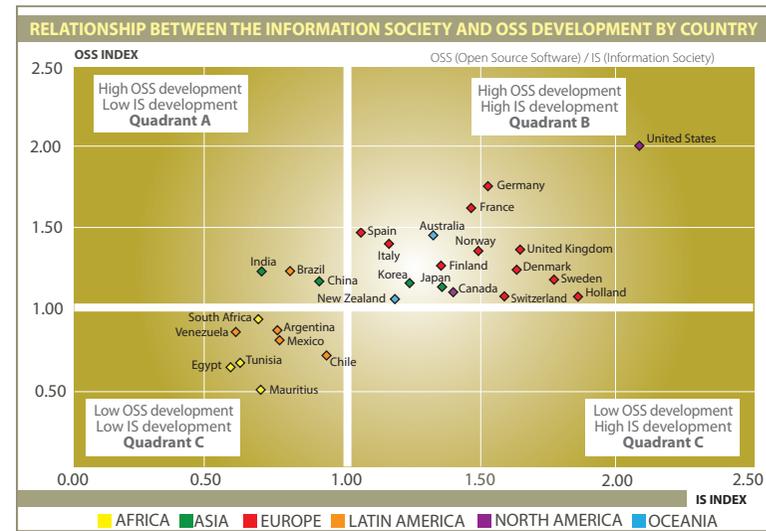
Adding the second dimension to understand the reasons behind the differences in the degree of OSS development, a matrix was created to cross the open source software index with the IS advancement index.

As can be seen in the following graph, there is a high degree of correlation between both indices; countries with a high degree of IS development also have high degrees of OSS development.



This relationship has already been clearly established in studies such as the “Study on the effect of the development of the information society of European bodies making their own software available as open source,” conducted by Unisys-MERIT in 2007 and the “Study on the Economic impact of open source software on innovation and the competitiveness of the Information and Communication Technologies (ICT) sector in the EU,” conducted by UNU-MERIT in 2006.

If we divide the previous graph into four quadrants, four groups emerge, crossing the high/low levels of the IS Index and the high/low levels of the OSS Index, and using an index value of 1 as the average value for both indices.



The countries with the strongest economies are concentrated in quadrant B, with values greater than 1 for both the IS Index and the OSS Index. This group includes the United States, the countries of the EU-15 and the most developed Asian economies, such as Japan, South Korea, and Australia.

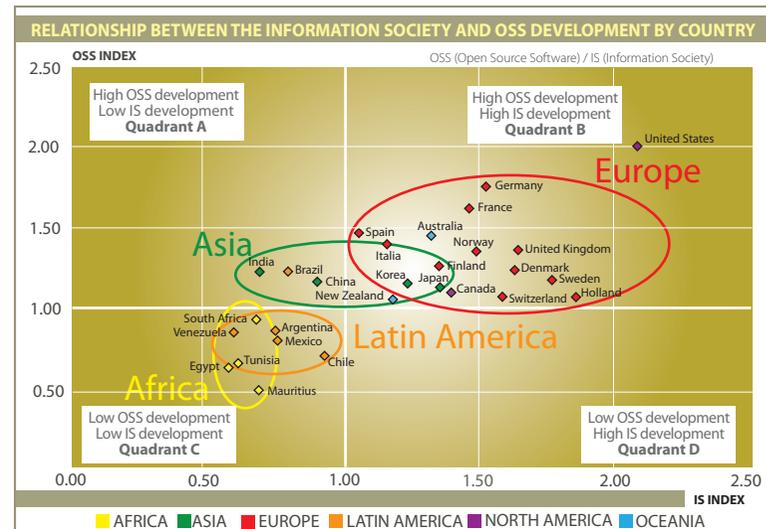
Quadrant C includes countries with weaker or developing economies, mainly African countries and most Latin American countries, as well as the latest additions to the EU (Latvia, Bulgaria and Cyprus) and Asian countries such as Cambodia and Vietnam. Except for a few notable exceptions, such as South Africa, Vietnam, Malaysia and Venezuela, most of the governments of the countries in quadrant C make no significant efforts to promote the IS, or to develop OSS.

Exceptions to the general pattern are India, Brazil and China, which appear in quadrant A. These countries score highly on the OSS Development Index, but are below average on the IS Index. This is explained by the fact that these countries are important developers of OSS and outsourcing production centres where OSS applications are developed, but are not large users or consumers of OSS. Nonetheless, in spite of being countries with low usage levels for the new technologies, their OSS know-how contributes to a high score on the OSS Index. This relationship corroborates a market situation in which OSS is designed in countries with advanced economies and produced in countries where labour is very cheap. In other words, an offshoring model is used for economic reasons. It is interesting to note that the countries in this group stand out for their high scores on social and academic variables on both indices, and for the support given by their respective governments for OSS development. As a result, these countries have the qualified human resources that make the development of OSS applications possible.

Engaging in a deeper analysis of the ranking of the countries in the matrix relating the Degree of IS Advancement to the Degree of OSS Development, we observe the formation of clusters or groups of countries according to their geographic region. For example, the main European countries (shown on the graph as red dots) are grouped around values between 1 and 2 on the X-axis, and values between 1 and 1.75 on the Y-axis.

The main Asian countries are concentrated in the area bounded by IS Index values between 0.75 and 1.5 and OSS Index values between 1 and 1.5.

Latin American countries are concentrated in the area bounded by values between 0.5 and 1 on both indices, while African countries show a similar dispersion with regard to the degree of OSS development, but less dispersion in the degree of IS advancement, with values between 0.5 and 0.75 on this index, representing the least developed geographical area in the world for IS and OSS.



A detailed analysis of each of the major geographical areas in the world has been carried out based on the relative position of the countries in each region for the analysed indices. The aim of the subsequent examination of each country is to understand the factors explaining these ranking differences, based on the four elements that form the OSS ecosystem²:

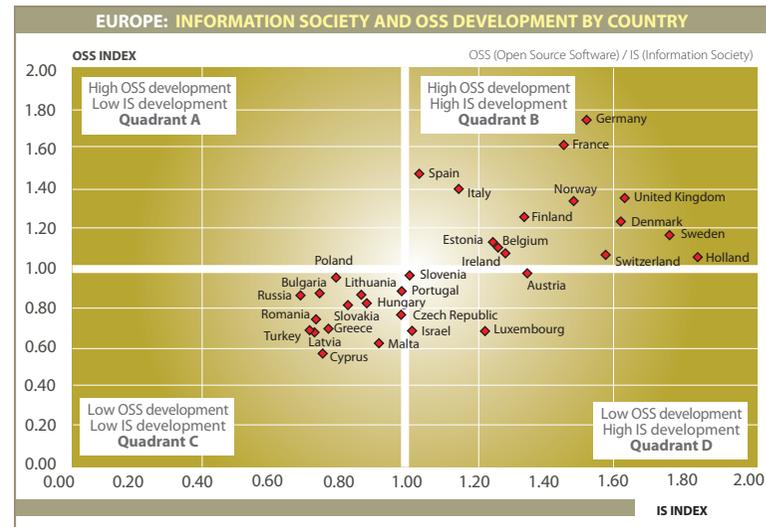
² Chapter 4, "State of affairs for Open Source Software by area," gives a detailed description of the situation in each geographical region with regard to open source software development, as well as the specific contribution made to this position by the most representative countries in the region.

1. The Administration's two-fold activity as a promoter of public policies in the area of OSS and as a user of OSS.
2. The degree of OSS production and adoption by the country's private business sector and the size and composition of the subsector formed by OSS companies.
3. The contribution of the country's universities to training qualified human resources and carrying out OSS-based projects.
4. Efforts by Communities of OSS Developers and Users³.

In **Europe**, the countries belonging to the EU-15 are ranked among the most advanced in terms of information technologies and OSS, while countries that have recently been admitted to the EU and non-member states are located in quadrant C.

Among the leading countries are Germany, France and Spain. These countries all have significant institutional support for the development and use of OSS, but also have some very interesting fundamental differences. While Germany has promoted OSS through policies to recommend and facilitate its use, France has fostered OSS through its implementation in public institutions and large public companies. In Spain, most public initiatives have taken place in the Autonomous Communities, under the OSS framework policies established by the Ministry of Industry, Tourism and Trade and the Ministry of the Presidency, resulting in a wide variety of OSS projects. These three countries also have excellent OSS suppliers in the internationalisation phase of their operations.

³ Chapter 4, "State of affairs for Open Source Software by area," gives a detailed description of the situation in each geographical region with regard to open source software development, as well as the specific contribution made to this position by the most representative countries in the region.



At the opposite end of the scale, we see the countries recently admitted to the EU, but we also find Portugal and Greece in quadrant C, meaning that they have below-average IS and OSS development despite both countries being members of the EU-15.

The low level of development in the use of OSS in Portugal seems to originate from the rejection by Parliament in 2003 of the proposed legislation that would have imposed the use of OSS on the Public Administrations. This appears to be the turning point that halted OSS development in Portugal, where to date most projects have been focused on the educational sector, thanks to the agreement signed with Sun Microsystems in 2004. In the case of Greece, the explanation also seems to lie in a lack of committed support from the Government. By comparison, Norway seems to be following exactly the opposite policy: in 2002, it declined to renew a contract with Microsoft in an effort to foster competition between proprietary software companies and OSS.

Between the leading group and the countries in quadrant C, we can identify at least two other groups of countries, based on their OSS Index level. Not far from the top group are Italy, the United Kingdom and the Nordic countries. The small difference between them and the leaders is mainly explained by the Administration's delay in implementing policies supporting OSS, as compared to the countries in the first group.

Both groups share numerous communities of qualified developers who are contributing to OSS projects and the development of the ICT sector in Europe.

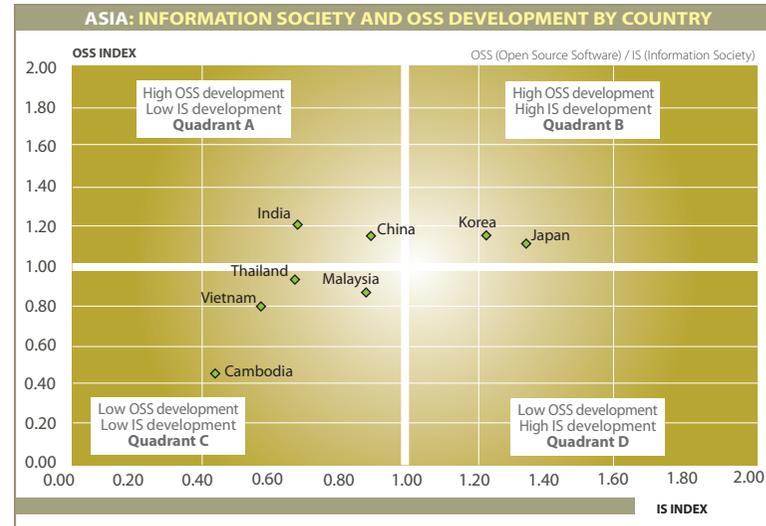
The most prestigious universities in these countries are collaborating with the main companies in the European ICT sector on research projects developing OSS. Many of these projects are financed by the European Union, within the framework of policies promoting the ICT sector in the European Union.

The following group of European countries, all found in quadrant B of the IS/OSS matrix, consists of Holland, Switzerland, Belgium, Ireland and Estonia. They demonstrate a lower degree of OSS adoption and development.

In the **North American** region, we find different levels of OSS development: while the U.S. is the leader in OSS, Canada has not fully exploited its potential. Although the Federal Government has not enacted clear, decisive policies supporting OSS in either country, in the U.S., different states have been active in promoting it, such as in the case of projects stemming from Law 2892 in Oregon and Law 1579 in Texas.

What has really positioned the United States as world leader in OSS development has been its private and social initiatives. Both the Free Software Foundation and the Open Source Initiative originated in the U.S. American universities have been the birthplace of many OSS projects.

In the **Asian region**, large, consolidated economies such as Japan and Korea stand out, as do developing nations such as India and China.



India is one of the most advanced developing countries in terms of OSS. The high level of training has created a very developed software industry in the country, where European and American companies subcontract development. On the one hand, India has abundant talent: it turns out 200,000 engineers, 300,000 technicians and over 3 million university graduates each year. Added to these figures are the many students who travel to the United States at some point in their university career to complete their training. On the other hand, labour costs are much lower than in most developed countries, where salary costs are on average 4 times greater for the same task.



However, even though a great quantity of OSS is developed in the country, the implementation level is not as high as it should be. This is due in part to the government not wanting to create a conflict of interests with the proprietary software companies that provide a great deal of work to local industry.

Japan, Korea and China signed a collaboration agreement to develop and support OSS, which has enabled the development of a standardised version of Linux, adapted for the Asian market. The three countries face a language barrier that makes it difficult for them to collaborate with the international community, leading to their lack of visibility. The community model is fundamental for localisation, and in this sense OSS makes a special contribution to bringing the IS closer and making it available to non-English speaking people, especially those from countries that do not use the Latin alphabet.

However, the development model in these countries is different. The Chinese Government has made a firm commitment to this model, with

activity planned and orchestrated by the state. To provide an example, the main supplier, Red Flag Linux, is partially state-owned, and is used by the government in its implementations.

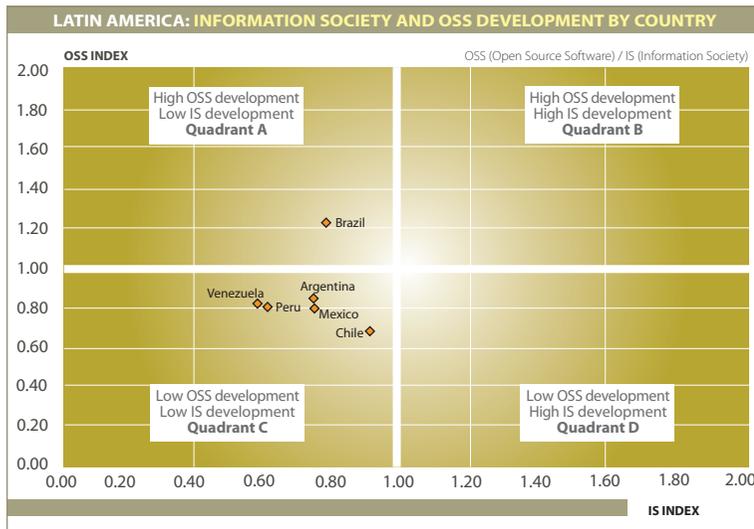
In Japan, the electronics sector enthusiastically promotes OSS development. Most products in this industry require the inclusion of embedded OSS systems. However, advancement in the adoption of OSS by the business sector seems to be slowed by the lack of suppliers.

For several years, Korea was very active in supporting OSS, and after a few years of inactivity it has recently resumed its activities. One of the latest government initiatives has been the creation of an international contest for developers, in which the leading supplier Haansoft participates.

As shown on the graph, the highest ranked country in **Latin America** is Brazil. Brazil has become the leading country in Latin America in terms of OSS development, and it also fits the paradigm of an ecosystem formed by four balanced elements: the Government, the private business sector, universities and the community of developers.

The government promotes its development and use, operating in all areas of the ecosystem through numerous regulations, such as Law 4/2008, on the process through which the Administration contracts IT services, and by mass migrations in the public sector, coordinated by specialised committees and included in annual plans (currently, the Strategic Plan from the Federal Government's Open Source Software Committee, CISL 2009).

Another Brazilian initiative has been the creation of a Public Software Portal to generate collaboration between users and developers and the Centre for the Diffusion of Technology and Knowledge (CDTC), promoted by the National Institute of Information Technology (ITI).



In 1999, the university centre UNIVATES, in southern Brazil, decided to develop its own academic administration system, called SAGU, using OSS tools. SAGU enabled UNIVATES to save almost €140,000 in license fees and nearly €48,000 in server and equipment updates. As a result, UNIVATES offered to let its IT team form a separate entity from the university, called SOLIS, as it was already developing solutions for regional industrial and economic problems that went far beyond its original functions. SOLIS currently has 51 employees developing OSS-based solutions for local industries and universities in Brazil. It charges for its services and provides its products under a GPL license.

On the second tier are countries like Argentina, Mexico, Venezuela, Peru and Chile. Generally speaking, greater user awareness regarding the use of 100% legal software will permit higher rates of open source software use in the future. Among these countries, the first three are the most active and have come the furthest in terms of OSS development,

although only the Government of Venezuela has come out in favour of OSS, as opposed to proprietary software. In 2004, the “Yellow Book of Open Source Software: the use and development of OSS in Public Administration” was published. The government also published Decree 3390, which establishes the mandate for the Administration to migrate to OSS over a two-year period.

In Argentina, Ututo was developed, which is the country's first Linux distribution to be recognised by the Open Source Software Foundation. Ututo plays an important and symbolic role in Latin America⁴, in spite of the central Government's lack of support. In Mexico, civil servants are able to choose the solution that best meets their needs, but the lack of suppliers is slowing down the rate of OSS adoption in the country.

Africa is still starting to take its first steps in the adoption and development of OSS, and governments in the respective countries still have not made a clear commitment in this regard. Nonetheless, it should be pointed out that greater awareness concerning legal software use would enable greater OSS development.

Tunisia and South Africa are the two countries with the greatest knowledge about OSS, and some official policies promoting it. Morocco is exploring the possibility of developing this type of policies.

The OSS community on the continent is very fragmented, and the most common projects are local adaptations. A good example of this is translate.org.za, a South African project for the local adaptation of several OSS initiatives to the country's 11 official languages. In this manner, OSS contributes to overcoming the English barrier, bringing the IS to people in developing countries.

⁴ El software libre y las perspectivas para el desarrollo en América Latina y el Caribe [Open source software and the prospects for development in Latin America and the Caribbean] http://www.mentores.net/Portals/2/mentores_net_sabemos_software_libre.pdf

To date, only South Africa has made significant advances in OSS in the country's economy, thanks to support from the government and organisations such as the Shuttleworth Foundation, which ran an interesting campaign to promote OSS: Go Open Source. The OSS Law of 2006⁵ established the preference for OSS over proprietary software.

Companies from the sector, in collaboration with the country's universities, contribute to training qualified OSS personnel. A flourishing subsector of OSS suppliers provides the support needed for the adoption of OSS by the Administration and private companies.

Here, we also find the combination of the four elements of the OSS ecosystem that have made South Africa the regional leader.

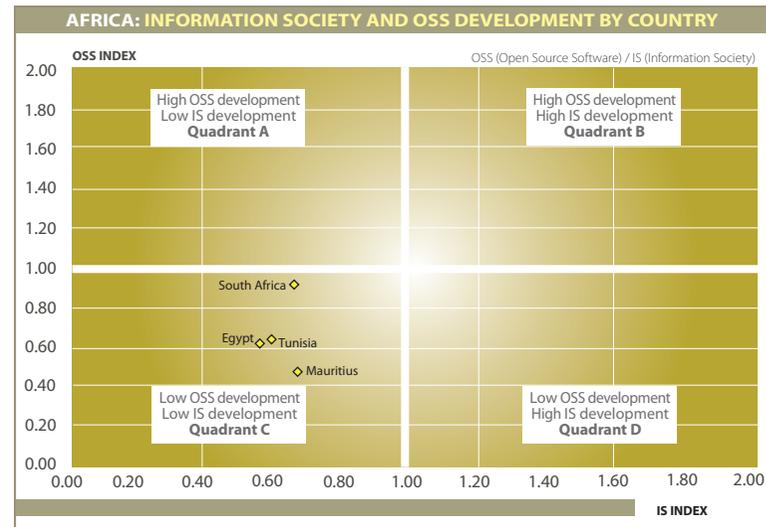
Organisations like UNESCO are contributing to the dissemination of OSS on the continent with projects such as the MITFTAAH memory stick, which is distributed in Tunisia, Algeria, Libya and Morocco, with OSS in Arabic, English and French.

There is no doubt that OSS will contribute to improving access to ICTs for those living in developing countries by reducing the cost of the minimum infrastructures required for the IS in countries with emerging economies, thereby eventually reducing the digital divide.

In the Oceania region, Australia leads the way as one of the countries with the highest level of OSS adoption worldwide, thanks to its active communities of OSS developers. Its participation in international projects is widely recognised. It is one of the countries with the highest number of contributors per capita, one-third of whom serve as project leaders⁶.

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⁵ <http://www.oss.gov.za/wp-content/uploads/2009/03/foss-policy-approved-by-cabinet-2007.pdf>

⁶ Waugh Partners. The Australian Open Source Industry & Community Report 2008 <http://census.waughpartners.com.au/census-report-2008-r1.pdf>



In addition, its universities play a very important role in the training of qualified ICT personnel. One of the best-known universities is the College of Information Technology at the University of Queensland, where students are exposed to OSS from the first semester of their studies. The university sector also plays an important role in collaborating on OSS projects. One such case is the state-run NICTA company, where different Australian universities⁷ engage in close collaboration with various governmental agencies for OSS projects.

An OSS-oriented business framework, the fourth essential element in the ecosystem, provides the support needed by the private business sector to adopt OSS. This makes Australia the paradigm of an ecosystem ripe for OSS development.

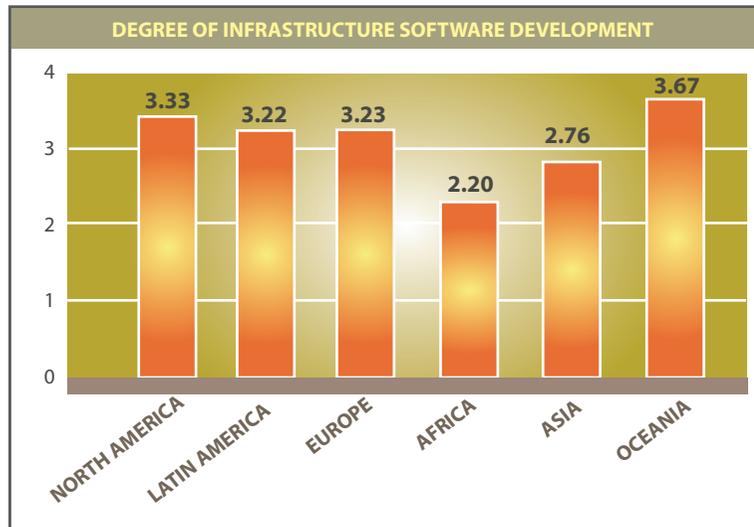
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⁷ University of Sydney, University of Melbourne, Griffith University, Queensland University of Technology and University of Queensland

2.1. Degree of advancement of OSS in technological categories.

With regard to the extent of OSS development in the different technological categories, a high degree of homogeneity is observed in all geographical areas in each category.

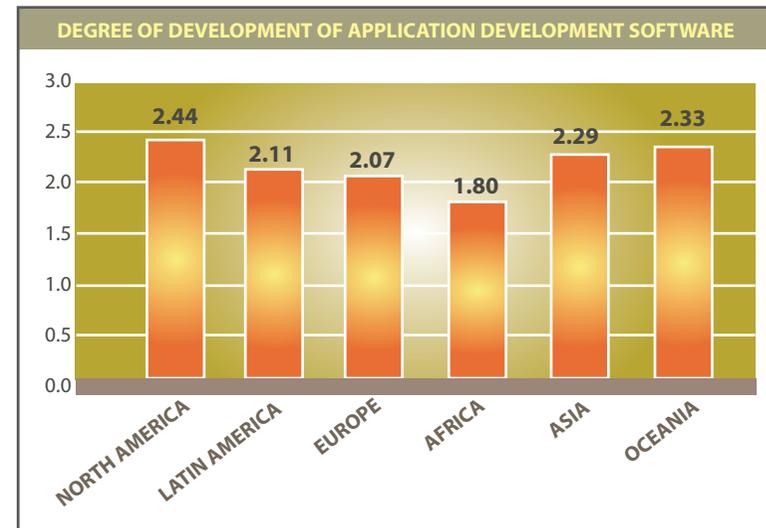
Based on a survey of a panel of experts, an average score was assigned for the degree of OSS development in each category. The experts were asked to rate, from 1 to 5, the degree of OSS development in their geographical region for each technological category. The results are shown below.

Infrastructure software is the category that shows the highest degree of development around the world, with an average value of 3.07, followed by applications development software, which obtained an average score of 2.89.

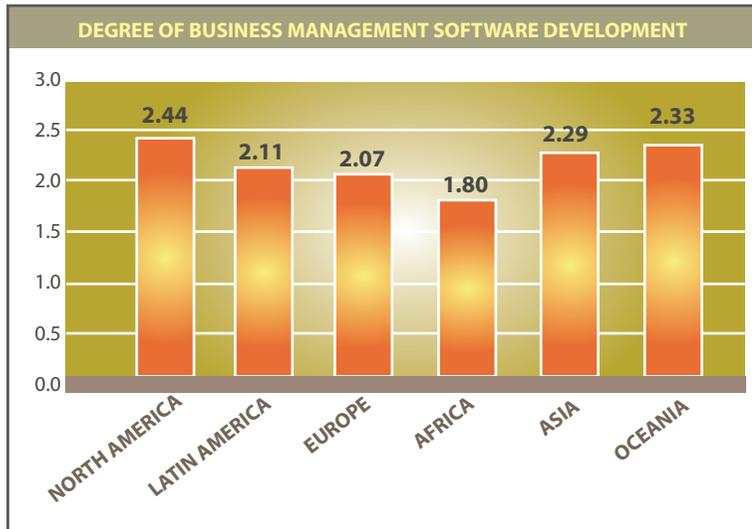


Oceania stands out for having the greatest OSS penetration in infrastructure software, followed closely by North America, Europe and Latin America. Asia and Africa have lower levels.

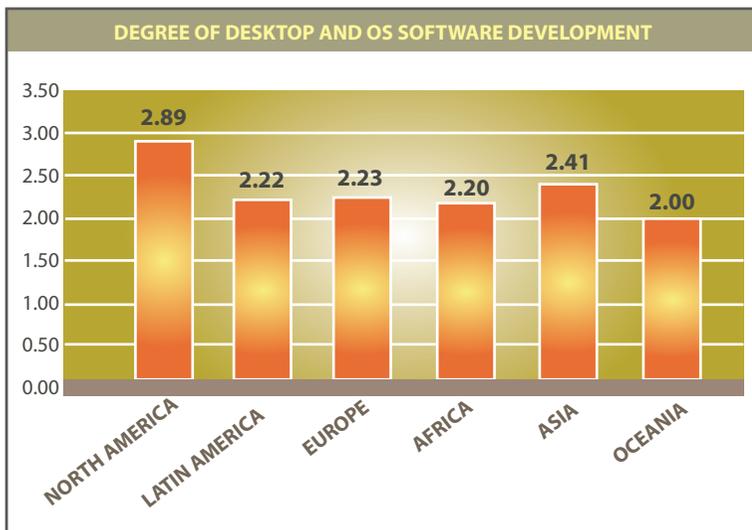
With regard to applications development software, all geographical regions except Africa have a similar level of OSS development, with a value of around 3, with North America leading the way with a higher score of nearly 3.50. Africa, on the other hand, clearly lags behind in this category, with experts giving its degree of development as a score of 2 on the 5-point scale.



In the business management software category, penetration is lower around the world, with a worldwide average of 2.17. All geographical regions show a similar level of development, with values between 2.20 and 2.40. Once again, the exception is Africa, which scored less than 2. North America and Asia lead in this category.



Finally, with regard to desktop applications, the average world penetration is similar to that of business management software, with experts giving an average score of 2.33 on a 5-point scale. Only North America stands out with a score close to 3, while for the rest of the geographical regions, the degree of OSS development in this category earns scores of around 2. In this case, Africa is at the same level as the rest of the continents, with the exception of North America.



With regard to the extent of OSS development in the different technological categories, a high degree of homogeneity is observed in all geographical areas in each category.



03



03 ■ Models / Typologies of Open Source Software ecosystems

Models/Typologies of Open Source Software ecosystems

Considering this study from a worldwide perspective, we proposed an examination of the types of business models in existence in the area of Open Source Software (OSS). Our aim was to understand the characteristics of the different models and their key success factors, and eventually the differences by geographical region.

To start with, we considered the OSS development model that became popular thanks to the GNU project, begun in 1983 by Richard Stallman, with the objective of creating an operating system similar to and compatible with UNIX and the POSIX standards. He also established the Open Software Foundation (OSF) in 1985, which developed the General Public License (GPL) to provide a legal framework for the free diffusion of the software generated. This permitted the project to be developed very quickly by many people, by means of a community of developers that joined forces to improve the initial product, the source code of which was accessible to members of the community.

By the early 90s, there was enough software available to create a complete operating system. The core was still lacking, however. In 1991, in Helsinki, Linus Torvalds began a project that would later become core Linux, capable of running BASH and the compiler known as the GNU Compiler Collection. The GPL for Linux was adopted in January 1992. This licensing model facilitates what is known as the bazaar development model¹, based on the exchange of information and work by community members.

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1 See "The Cathedral and the Bazaar," Eric S. Raymond, September 11, 2000. <http://catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/index.html>

This model currently permits:

- The creation of groups of developers on a worldwide scale, in different time zones and different geographical regions, who share knowledge and code.
- High-quality developments and innovations that otherwise only large corporations could afford, due to the cost they represent.
- Shorter timescales for launching new products on the market.
- Access to low-cost solutions, upon which many of today's successful companies are based.
- Scalability; OSS allows capacity to be increased to meet growing demand.

According to Rishab Ghosh in his study "The Economic Impact of FLOSS"², version 2.2 of Debian GNU/Linux, launched in 2001, contains 55 million lines of code, of which core Linux occupies only 6%. If Debian had been developed by a private company, the estimated commitment would have been 14,005 persons/year, and the estimated project would have taken 6.04 years to complete with a team of 2,318 developers, at a development cost of €1,294,110,796.

Eric Raymond characterised the differences between the software development models by dividing them into two types: "cathedral and bazaar."³ Accordingly, the development of proprietary software is likened to the building of a cathedral (enormous, closed, slow), while the development of open source software is like a bazaar (flexible, open to new ideas, fast and very independent).

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2 <http://robertoallende.com/tecnologia/eventos/rishab-ghosh-el-impacto-economico-del-software>

3 See "The Cathedral and the Bazaar," Eric S. Raymond, September 11, 2000. <http://catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/index.html>

OSS is developed through a model that combines the advantages of scientific research; namely, altruism, collaboration, communitarianism and meritocracy; with the so-called good economic practices, such as free market competition, for example.

The community forms an extensive ecosystem, where all players have a place and participate in the community, each contributing improvements to the project based on their perspectives and interests.



The development model based on communities provides a vision that is user-focused, as opposed to supplier-focused.

The ecosystems that exist around a community are formed by the Public Administration, universities, developers, OSS suppliers, integrators, hardware companies, users and clients.

The variety of players involved has resulted in two phenomena that contribute two fundamental values to the model. The first is that OSS is based on user-centred development, as opposed to supplier-centred development, the principle behind which is to make the user or end client a participant in the development, from tasks such as error reports to collaboration by means of functionality routing sheets. The second phenomenon is “cooperation⁴,” in which potential competitors collaborate in the same community on the specific project being developed by the community. They cease to compete and enter into collaboration with one another so that both may obtain benefits.

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4 Cooperation and Competition

According to Gartner⁵, there are four different types of communities:

- “Ad-hoc” communities, which emerge from concrete, specific projects that meet niche needs, for example, “Three Guys” at SourceForge.
- “Foundation” communities, from which projects evolve that grow to such an extent that it becomes necessary to formalise the governance of the community. Examples include Debian, Ubuntu, Apache Foundation, Gnome, KDE, etc.
- “Business consortium” communities that emerge when their members participate in the OSS development philosophy and are also interested in maintaining commercial relationships. One clear example is Eclipse, in which IBM, Oracle, SAP, Motorola and Nokia (among others) participate⁶; another is Genivi, which involves participation from BMW, GM, PEUGEOT, CITROËN, Windriver, Intel, etc.,⁷.
- “Sole supplier” communities, where a single company controls the project development, but encourages the participation of a “subcommunity” to perform certain types of services, such as local adaptation, “add-ons,” etc. Examples of this type of community are MySQL and SugarCRM.

In the study by the International Development Research Centre⁸, it is argued that the greatest advantage that OSS suppliers have is the community that surrounds them. This community becomes a growing market, a source of innovation, a method for improving and escalating products, a place to try out new ideas and versions, and a source of

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5 How Open Source is changing the shape of IT www.gartner.com

6 The strategic members of the community are Actuate, brox, Cloudsmith, CA, Genuitec, IBM, Innoo pract, itemis, Motorola, Nokia, Obeo, Oracle, SAP, Sonatype and Sopera. There are also approximately 170 other companies that participate.

7 <http://www.genivi.org/>

8 El software libre y las perspectivas para el desarrollo en América Latina y el Caribe [Open source software and the prospects for development in Latin America and the Caribbean] http://www.mentores.net/Portals/2/mentores_net_sabemos_software_libre.pdf

qualified human resources. Many companies are set up as a result of the spaces created by OSS communities and continue to maintain a close relationship with them (assuming leadership roles in user groups, organising events, collaborating financially and working on non-profit projects). The people who form the companies and the new human resources that are incorporated often know each other and recognise each other's merits due to their roles in the community and their contributions to development. Some companies, like Open Intelligence in Mexico, operate as intermediaries between developers who lack a high commercial profile and clients who need their services, providing the infrastructure to facilitate full-time work for the developers.

One opportunity perceived by companies is the capacity to form alliances on a local, national and international level. Some see certifications as an opportunity to market their products, guaranteeing a standard of quality. One example is Argentina's Opensa, which in its day formed alliances with players from different sectors to seek out fair business ventures of benefit to both parties. In a general sense, competition and collaboration are two elements that always come into play when trying to do business within the community.

Companies look for appropriate partners for distribution, hardware manufacturers that use OSS, integrators that sell OSS services, etc.

Currently, there are different business models, some of which have already proven to be profitable, while others are still very new.



The OSS sector seeks partners and alliances based on “coopetition” as a model for improvement and evolution.

The different business models can be classified into five groups:

- Subscription to service-based products
- Value-added services
- Software as a service (SaaS)
- Hybrid model
- Cross-selling

Companies in the sector can, and usually do, operate more than one business model simultaneously and adapt to market demands, meeting the needs of the clients in each case.

In the first model, the client pays a subscription to receive a series of related services, such as support, maintenance, etc. One example of this very successful model is SpikeSource. This company distributes, integrates, manages and provides related support services, for which it charges a subscription fee. SpikeSource works with major OSS suppliers, including Apache, MySQL, etc.

The second model is one in which the company provides OSS-related value-added services. This covers a wide range of services, from consulting to integration. These companies actively participate in different communities, acquiring vast knowledge and skills that allow them to market their know-how in the field of OSS.

The third model is new. Software as a service consists of a service through which clients remotely access applications over the Internet. Clients only pay rent for the services they use.

The hybrid model merges elements of proprietary software with those of OSS. In this case, clients have access to specific software under a free license. However, when they decide to increase its functionalities, want extensions or improvements, etc., these improvements are then distributed under another license.

Finally, the business model we refer to as cross-selling covers a very heterogeneous group of activities, from companies whose business model is based on OSS, such as Google and Collax, to companies that use OSS embedded in the hardware (decoders, "boxes"⁹, etc.) they sell, to OEM suppliers¹⁰ or the mobile telephone sector.

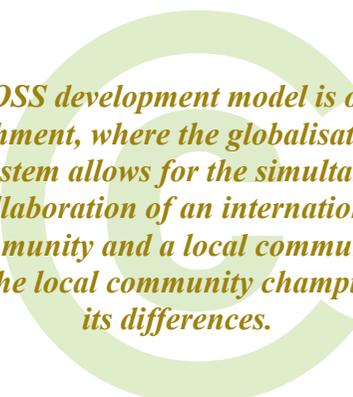
Clients in the embedded OSS market are the manufacturers of various devices, such as mobile telephones or decoders. This is a B2B market, where the end customer has no knowledge that he is using OSS. The advantage of OSS use in this market is cost reduction and the possibility for the manufacturer to customise the software. With regard to OSS for mobile phones, it is not yet a question of generating income, rather a "war" for positioning, for dominating the operating system in the terminals, which will potentially generate significant income along the value chain in this business.

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9 Such as Netezza or Collax, for example.

10 Original Equipment Manufacturers

Neither the secondary sources consulted nor the telephone interviews with experts identified any significant differences in either the communities or business models by geographical region. The OSS development model is a model that globalises, where players take part in different projects over the Internet, regardless of the nationality of either the player or the project.

It could be said that OSS development is perfectly framed within the global IS model of the 21st century, built from the Internet and with the possibilities for interaction and cooperation at a global level that it provides. The Internet is clearly an essential medium for the development of these communities, enabling "spontaneous" participation in areas of global interest. The advantage of the OSS development model lies in its universalising factor, with the international community collaborating on and enriching projects, but at the same time being capable of generating local adaptations.



The OSS development model is one of enrichment, where the globalisation of the system allows for the simultaneous collaboration of an international community and a local community, with the local community championing its differences.



04

04 . State of the art for Open Source Software **by region**



State of affairs for Open Source Software by region

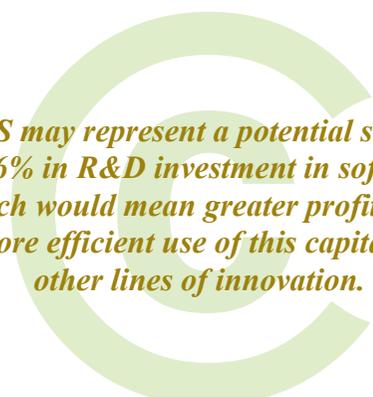
The Information and Communications Technologies (ICT) sector is becoming increasingly important in the economy of all countries, representing approximately 10% of GDP in most developed countries and accounting for more than half of their economic growth forecasts. Software constitutes one of the main elements in the role played by the ICTs in the economy, and the structure, competitiveness and performance of the ICT industry may be greatly affected by Open Source Software (OSS). According to UNU-MERIT, OSS may represent a potential saving of 36% in R&D investments in software, which would mean greater profits or a more efficient use of this capital in other lines of innovation.

OSS is experiencing significant development in our Information Society (IS). Many examples exist of technological implementations based on OSS. Administrations, universities, companies and organisations of all types around the world are opting for OSS products.

OSS has obtained a significant share of several markets, such as web servers, server operating systems, desktop operating systems, web browsers, databases, e-mail and other ICT infrastructure systems. These market shares are higher in Europe than in the United States (with Asia in third place), and they have grown significantly over the last five years.

In the public sector, Europe has greater penetration, although Asia and Latin America may soon catch up. In the private sector and at an international level, OSS adoption is led by medium and large companies. While the United States leads in terms of large OSS-related companies, the greater individual contribution from Europe has resulted in a growing

number of success stories from small and medium-sized European companies in the field of OSS. Europe is the leading region in terms of collaboration among OSS developers, followed by North America. Asia and Latin America are faced with a great disadvantage because of language barriers, but they may be experiencing an increase in activity in the local communities. OSS has been implemented for quite some time in universities and R&D centres around the world. The availability of source code, cost savings, its adaptability, independence from suppliers, and its robustness and security are some of the advantages that free technologies offer over private software in this area.



OSS may represent a potential saving of 36% in R&D investment in software, which would mean greater profits or a more efficient use of this capital in other lines of innovation.

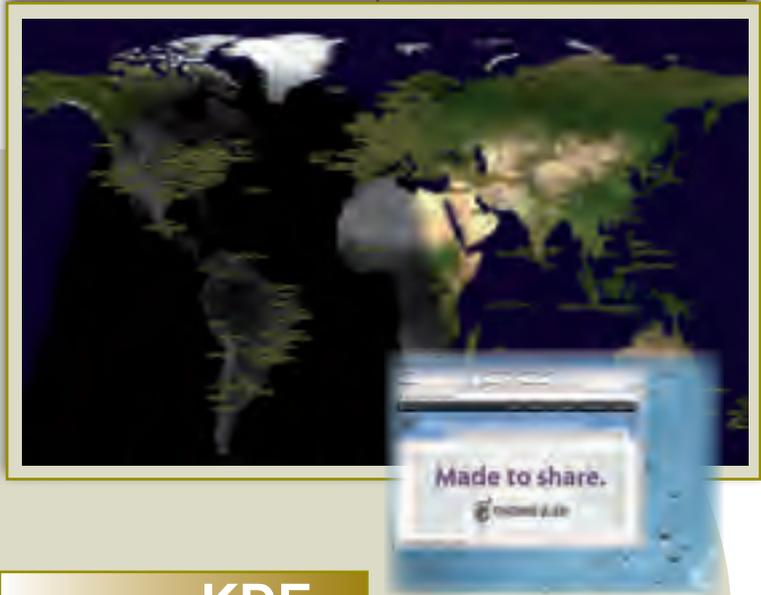


The following maps show the worldwide distribution of some of the main OSS development communities:

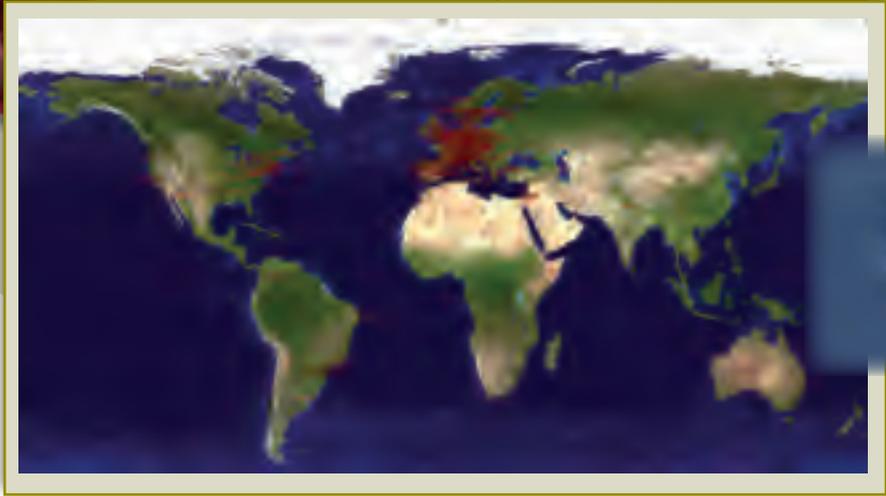
DEBIAN



GNOME



KDE





Most Linux distributions are, to a greater or lesser extent, developed and led by their communities of developers and users. In some cases, they are led and financed completely by the community, as with Debian GNU/Linux, while others rely upon commercial distribution and a version of a community, as we see in the example of RedHat with Fedora or SuSE with OpenSuSE.

There are OSS communities whose members include small, medium or large companies, public administrations, universities and research centres and technology centres. They all share the principle that OSS is an effective strategy for improving the processes of technology research, development and innovation, making it possible to establish viable business models and win-win relationships that promote collaboration.

OSS has a great future ahead of it. There are several reasons to promote and support OSS:

- Financial reasons (it is cheaper, has lower development costs, reduces development time, enables local ICT company development, etc.)
- Cultural reasons (it fosters and meets the demands of multiculturalism and the presence and needs of minority languages and cultures.)
- Technological reasons (it is more flexible and user-oriented, involves the end user in the development, is more advanced, more stable, more secure, etc.)

According to Mark Shuttleworth of Ubuntu, software distributions will be universal in the future, but will leave room for customisation, whether cultural (according to different languages or cultures), sector-based (for the educational or industrial sectors), or professional (distributions for physicians, architects or teachers, etc.).

Everything would seem to indicate that this adoption process will accelerate over the next few years. In spite of this, however, the level of adoption in each country, the approaches of the different governments, the commitment by private companies, society's participation in communities and university-based research will vary significantly, according to geographical region.

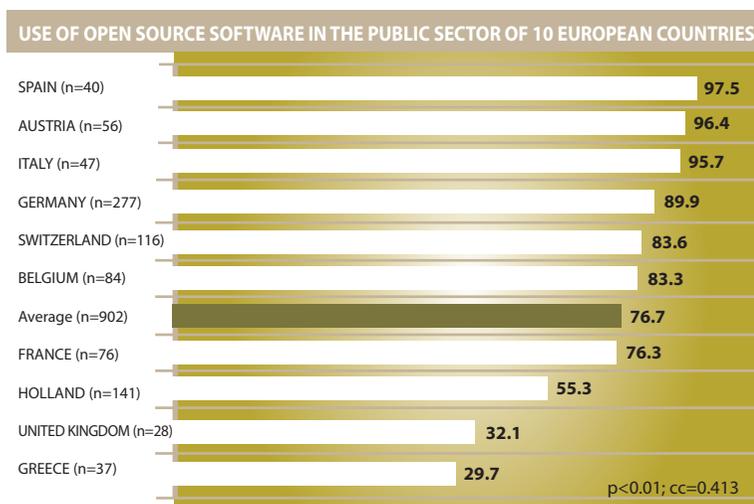
This chapter provides an in-depth analysis of the degree of OSS maturity in each geographical region, and the current status of the main countries that significantly contribute to the state of affairs for OSS use and development by geographical region.





4.1. EUROPE

The difference among European countries in terms of OSS development is evident. According to the “Flosspols” survey conducted in the EU in 2005, 79%¹ of the countries surveyed use OSS to some degree. However, while some countries, such as Germany, Spain and Italy, are significant users, others such as Greece and the United Kingdom show a lower degree of adoption, coinciding precisely with the fact that their public administrations have not been pioneers in adopting and promoting OSS.



SOURCE: MERIT 2000 (FLOSSPOLS LocGov Survey)

The survey examines the reasons for these differences among countries. One of the influencing factors is the professional experience of IT directors: the greater their programming experience, the more they appreciate access to code.

¹ See “Guidelines Public procurement and Open Source Software,” published in 2008 by IDABC OSOR

In some countries, such as Holland, Sweden, France and Italy, interoperability was one of the factors taken into account when deciding to implement OSS, while in others, such as Greece and the United Kingdom, compatibility with already installed software was especially important.

According to Gartner², the level of OSS implementation in Europe will gradually increase as the supply and support services mature. Based on a series of surveys conducted in different European countries, Gartner published some interesting conclusions about the starting point for OSS in Europe and its short-term prospects.

European countries show considerable interest in OSS for different technologies, from operating systems to applications, infrastructure and development tools.

OSS is commonly used in server operating systems, and is already considered to be a “commodity³”. In a similar manner, database management systems (DBMS) are widely implemented. According to Gartner's survey sample, one of every five companies in France, Germany and the United Kingdom have implemented OSS for CRM.

Institutions in the European Union have been an important driving force in terms of OSS development and adoption in Europe. As a result, various OSS policies⁴ and reports have been developed at a European level, such as “A Guideline for F/OSS Adoption in Public Sector with special focus on target countries,” which formed part of the tOSSad project, and “Guidelines for Public Procurement and Open Source Software” from the IDABC OSOR. The “European Interoperability Framework” establishes a set of recommendations and guidelines for electronic administration services.

² Open Source in Europe 2008 by Gartner. www.gartner.com

³ Commodity: English term commonly used in business jargon to describe basic or generic goods, with no distinction between the two.

⁴ For more information, see Government Open Source Policies published by CSIS in 2007 and 2008.



The “eEurope: An Information Society for All” document recommended that, during 2001, the European Commission and the Member States promote the use of OSS in the public sector and best practices in electronic administration by means of an experience exchange (IST and IDA programmes). The IDA Programme’s study on the use of open source programs in the Public Sector analyses different aspects related to OSS use by the Public Administrations.

Especially relevant for the promotion of OSS in Europe is the report issued by the European Commission, “Pooling Open Source Software,” which pointed out the potential savings derived from sharing open license software in the electronic administration and recommended the creation of a public sector OSS repository.

In 2003, the European Commission issued the document “Encouraging good practice in the use of open source software in public administrations,” which focused on the development of OSS competence centres at a national and regional level to facilitate the exchange of information about the opportunities and risks associated with OSS.



This same year, it also published the “Open Source Migration Guidelines,” which highlighted the main reasons for and benefits of migration to OSS for the Public Administrations. These recommendations from the community’s IDA programme are intended for use by information technology managers and professionals in the Public Administrations, with the goal being to help them decide whether they should undertake migration to OSS and to describe how to proceed with this migration, if appropriate.

On a practical level, worthy of mention is OSS adoption by EU institutions through projects such as the implementation of OSS in Eurostat. The lack of interoperability in data exchanges among the different countries led to the launch of the SDMX Open Data Interchange (SODI) project in 2005. As part of this project, a series of tools were developed and published under an EUPL license⁵.

In its role determining the development policies at a European level, the European Union has worked to promote the information society in Europe, as well as the development of the ICT sector. When establishing ICT development directives in Europe, important studies show the fundamental role that may be played by OSS. In their article “The Rain Forest and the Rock Garden: The Economic Impacts of Open Source,” Forge and Simon⁶ reflect on the need to promote OSS in Europe, in order to create a solid software industry.

The report on the economic impact of OSS, commissioned by the European Commission,⁷ also lends support to the great importance of OSS in the development of the ICT sector in Europe, and highlights this by estimating that OSS-related activities generate a turnover of around

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⁵ For more information, see http://www.osor.eu/case_studies/eurostat-standards-and-open-source-software-for-data-interoperability

⁶ Published in The Journal of Policy, Regulation and Strategy for Telecommunications, Information, and Media 8, No. 3 (2006)

⁷ European Commission’s Directorate General for Enterprise and Industry. “FLOSS impact: a study about the economic impact of OSS.”



€263,000m in the European Union, which will result in an estimated contribution of 4% to the community's GDP in the year 2010.

Europe has an important community of developers helping this institutional push for OSS development to come to fruition. The aforementioned report from the European Commission estimates that 565,000 jobs in the European Union are linked to OSS-related activities, making Europe the leading region in terms of the number of active OSS developers and the number of global OSS project leaders. According to Alfresco⁸, the size of the OSS community in Europe may be as much as 2.5 times the size of the OSS developer community in the United States.

However, the fragmentation of the universities and the lack of coordination of academic efforts is one of Europe's weaknesses when it comes to its universities making a greater contribution to the development of the ICT sector. The creation of the European Institute of Technology and Innovation is intended to alleviate the effects associated with this academic fragmentation and to strengthen the role of universities in innovation. One exception to this is the OpenSPARC CMT (Chip Multithreading Technology) project launched by SUN Microsystems and Europractice, involving 650 European universities and research institutes in 38 countries, to foster innovation in processor design and promote the development of a high-tech industry in Europe.

The Framework Programmes for Research and Technological Development begun by the European Union have contributed to the participation of the universities in open source projects. One such example is the SHARE project, founded as part of the ICT agenda of the Seventh Framework Programme (FP7) to improve the competitiveness of the European embedded systems industry through OSS sharing. The University of Bologna and Madrid Polytechnic University participate in this project, as do companies such as Siemens, SESM scarl and Ciotech.



Other OSS-based projects of seminal importance for Europe carried out within the scope of the Seventh Framework Programme for Research and Technological Development are RESERVOIR, P2P-NEXT and ASPIRE. What stands out in these projects is the contribution of prestigious European universities and their close collaboration with large companies in the sector. Worth mentioning is the involvement of the University of Delft in Holland, University College London and the University of Lancaster in the United Kingdom, the University of Aalborg in Denmark, Complutense University of Madrid and the Barcelona Media Foundation-Universitat Pompeu Fabra in Spain, the University of Lugano (l'Universita Della Svizzera italiana) in Switzerland, the University of Bologna and the University of Messina in Italy and Bucharest Polytechnic University in Romania, among others.

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8 Alfresco: The Open Source Barometer, 3rd Edition.



Also noteworthy is the OSAmI-Commons project, part of the Eureka-ITEA2 project financed by PROFIT, which has benefited from the participation of leading European businesses, research institutes and universities. Its goal is to develop the base platform for ambient intelligence applications. OSAmI-Commons intends to establish a common open code infrastructure oriented toward dynamic services, which will be capable of autoconfiguration in different cooperative environments involving Software-Intensive Systems. The platform will be validated by demonstrators in the areas of energy, health, public services, education and software development. Public and private organisations from Germany, Finland, France and Turkey also participate in the project consortium, under Spanish direction.

Like the Public Administration, large European companies are also adopting OSS as part of their business process management. Airbus is one such company. It uses Eclipse-based OSS in development tools when creating critical business systems. We find other examples of OSS use in large European companies such as EDF (France) and Deutsche Bank (Germany), among others.

According to a study by Forrester⁹, the type of service that European companies look for in an OSS supplier is advice on the selection of operational software and services, while American companies are more interested in the suppliers certifying the OSS.

On the following pages, we shall describe the contribution made by the main European countries to the development and adoption of OSS in Europe, highlighting the role of the Public Administration and the degree of development in the private business sector based on the development and marketing of OSS. We shall also analyse the contributions of universities and the Community to the level of OSS in each country.

⁹ Open Source Software's Expanding Role in the Enterprise http://www1.unisys.com:8081/eprise/main/admin/corporate/doc/Forrester_research-open_source_buying_behaviors.pdf

The main OSS projects carried out over the last decade will be presented in order to determine the extent of OSS adoption in each country. The process followed by each country to reach its current degree of OSS adoption conditions both its current position and its possible development over the next few years.



4.1.1. Germany



Public Sector

Germany is one of the leading countries in terms of implementation¹⁰, with the German Government for years being one of the most active in promoting the development of this type of software, along with the French

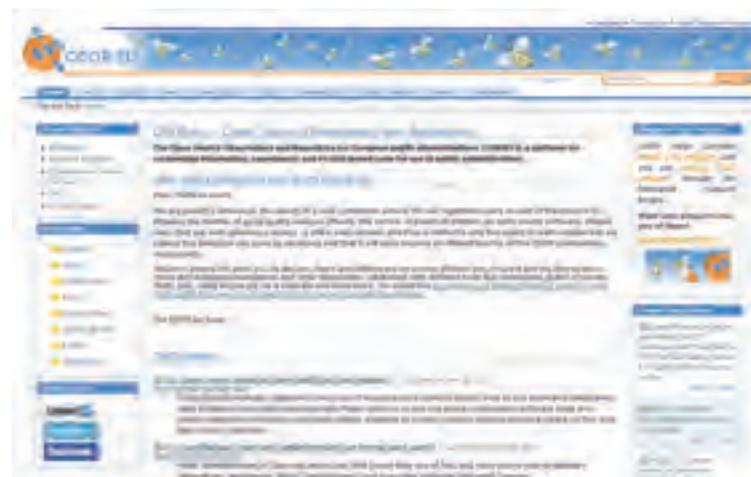
¹⁰ "Office suite: When it comes to content, it comes from Microsoft Office. However, users in Germany and France are twice as likely to use OpenOffice than in the US or UK. Microsoft Office 66%, OpenOffice 24%," and "We believe that in Europe, government is driving adoption, with leading exponents being France and Germany" in The Open Source Barometer by Alfresco, published in November 2008. <http://www.alfresco.com/community/barometer/files/wp-osb-III.pdf>



and Spanish Governments¹¹. As early as 2000, the German Government showed public support for OSS as the base model for the information era in Europe¹², with the aim of reducing costs and improving security.

The German Federal Government has carried out a series of specific initiatives to inform about the advantages and disadvantages of OSS. One of these initiatives has been the creation of the KBSt, an agency advising on and coordinating Information Technologies for the federal Government. This agency publishes reports, documents and press articles about OSS in the Federal Administration¹³. Reports from the KBSt are intended to provide an overview of IT best practices, developments and experiences coming from the federal authorities. One of the most important reports is “Letter No. 2/2000 Open Source Software in the Federal Administration” about OSS in the Public Administration¹⁴.

At a later date, in November 2001, the Bundestag approved a resolution promoting the use of OSS as a means of ensuring competition to the proprietary companies dominating the sector, stressing its advantages¹⁵ and portraying it as an opportunity for the European software sector. That same year, the BMWi, the Federal Department of Economy and Technology, published an open source software guide for small and medium-sized companies entitled “Open Source Software, A guide for



small and medium enterprises.”¹⁶ At the same time, the Court of Auditors published a report in which it declared that OSS provides functionalities comparable to those of proprietary software and recommended the use of OSS in the Federal Administration, estimating savings of around €100m¹⁷.

In 2002, the German Federal Ministry of the Interior signed an agreement with IBM and SuSe, according to which government agencies would receive discounts for implementing Linux¹⁸. With this agreement, the German Government moved from a recommendation-based support for OSS to explicit support, coordinating tools for obtaining tangible benefits for public agencies that implemented Linux. One year later, more than 500 government agencies had already benefited from the agreement¹⁹.

11 A 2000 research study by Paul Jones about the contribution of Linux concludes that the group making the second greatest contribution consisted of Germans. Matthew Aslett, June 2008. <http://blogs.the451group.com/opensource/2008/06/26/open-source-tour-of-europe-germany/>

12 “I am convinced that open source development can form the European base model in the information age,” declared German Secretary of State Siegmur Mosdorf from the Federal Ministry of the Economy and Technology during LinuxTag 2000. <http://www.internetnews.com/bus-news/article.php/408271>

13 <http://linux.kbst.bund.de>

14 Open Source Software in the Federal Administration http://www.bit.bund.de/nn_1333080/BIT/DE/Shared/Publikationen/OSS/KBSt-Brief-nr-2-2000__engl,templateId=raw,property=publicationFile.pdf/KBSt-Brief-nr-2-2000_engl.pdf

15 Article in the Michigan Telecommunications and Technology Law Review, “Government Preferences for Promoting Open-Source Software: A Solution in Search of a Problem Sent: Thu Jan 14 17:35:02 2010h. <<http://www.mtlr.org/volnine/evans.pdf>>

16 Study into the use of Open Source Software in the Public Sector del 2001. <http://www.osor.eu/idabc-studies/expert-docs/oss-fact-sheet>

17 To read more about policies and reports published by the German Administration, see “Government Open Source Policies,” published by the CSIS in 2007 and 2008.

18 BBC News article <http://news.bbc.co.uk/2/hi/business/2023127.stm>

19 Infoworld news article <http://www.infoworld.com/t/platforms/over-500-german-government-agencies-using-open-source-429>



In 2003, the government published a guide for migration to OSS for Federal Agencies and Public Administrations²⁰.

By creating BerliOS, an OSS competence centre, the government provided a support structure and a way of mediating between the different players in the OSS sector. BerliOS maintains a web portal with documentation and a database of distributors, products, applications, downloads, etc. In this sense, BerliOS provides the opportunity for OSS developers and companies to introduce themselves to a wider public, enabling new projects to be set up.

Until 2003, the German Government was very active in promoting the use and implementation of OSS. However, this firm support slowed until 2007, when action in favour of OSS was once again observed.

In the public sector²¹, examples of OSS projects are quite varied: The Federal Ministry of Finance, the German Aerospace Centre, the Federal Ministry of Foreign Affairs²², the German public company Deutsche Bahn, the Monopoly Commission, Air Traffic Control, the German Federal Institute of Geoscience and Natural Resources, etc.

One of the best-known cases of OSS migration is that of the city of Munich. In May 2003, the city announced its plans to migrate 14,000 PublicAdministration computers over to Linux and other OSS applications

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20 Updated in 2005 and 2008 (Migration Guide 3.0) <http://ec.europa.eu/idabc/en/document/7675/499%20>

21 <http://www.osor.eu/news?> <http://ec.europa.eu/idabc/en/document/2204/470%20http://ec.europa.eu/idabc/en/document/4396/470%20>

<http://ec.europa.eu/idabc/en/document/3411/499%20>

"Software Libre na Europa" [Open Source Software in Europe], published in 2005 by SoftwareLivre@AP.

"Guidelines Public procurement and Open Source Software," published in 2008 by IDABC OSOR

22 In October 2007, the Foreign Office expressed its support for the OpenDocument format, while in 2008 it described the adoption of OOXML as inappropriate.

through an agreement with IBM and SuSe (the LiMux project²³). Despite Microsoft making a special offer, with a cost lower than that estimated for the migration to OSS, it was decided to implement OSS as opposed to proprietary software because it provided a greater level of independence²⁴. The migration process eventually began in 2006, to attain greater independence, increase the security level and achieve savings in the IT area. Finally, the Linux migration was performed by two local suppliers, Softcon and Gonicus. Novell participated in the migration from NetWare to Open Enterprise Server²⁵. A budget of €35m was allocated, 38% of which is to train the Administration's staff²⁶.

There are other examples of OSS implementation at a local or regional level, such as those in Schwäbisch Hall, Mannheim, North Rhine Westphalia, Lower Saxony, Heidenheim, Berlin, Treuchtlingen, Osterburg, Stuttgart, Frisia, Friesland, Freiburg, Nordrhein-Westfalen and the German Alliance of Cities and Communes.

Private sector

According to a survey conducted by Actuate in 2009²⁷, 60.6% of the companies in the private sector said that they were already using OSS, 4.1% were in the process of implementation, and only 8.1% had no plans for adoption.

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23 Similar projects are underway in Holland, with OpenAmsterdam, in Vienna, with Wienux, and in Saragossa, with AZLinux.

24 Declarations made by Otto Schily, German Interior Minister, in June 2003: "We raise the level of IT security by avoiding monocultures; we lower the dependency on single software vendors; and we reach costs savings in software and operation costs." Report "Open Source software: Perspectives for development," by Paul Dravis.

25 Matthew Aslett, June 2008. <http://blogs.the451group.com/opensource/2008/06/26/open-source-tour-of-europe-germany/>

26 For more information, see the study "Software Libre para el Desarrollo del Tercer Mundo" [Open Source Software for Third World Development] by Jesús Javier Estepa Nieto and http://www.osor.eu/case_studies/docs/IDABC.OSOR.casestudy.LiMux.pdf

27 Actuate: <http://www.actuate.com/download/OpenSourceSurvey/oss2009.pdf>



According to a survey conducted by Actuate in 2008, the most commonly used technologies are Linux Operating Systems (55%), Apache (52.1%), Tomcat (44.3%), MySQL (35.7%), Mozilla (34.3%), PHP (33.6%) and Eclipse (30.7%). Of particular interest is the penetration of Apache, Tomcat, JBoss and especially Eclipse with respect to the previous year in companies in the financial sector.

One of the main Linux distributors is SuSe Linux. While in the rest of the countries, Red Hat Enterprise Linux is used twice as much as SuSe, in Germany, SuSe Linux is used four times more than Red Hat Enterprise Linux²⁸.

The German market includes international OSS suppliers with operations in Europe and the United States. Particularly relevant are Open-Xchange, formerly known as Netline, which provides products based on OSS technologies and recently transferred its headquarters to New York, and sCredativ, which is in the process of European expansion.

Another success story is Collax, which has also entered the United States market thanks to Collax Business Server, providing an alternative to Microsoft Business Server for SMEs. The success of its positioning stems from the concept behind its "Simply Linux" strategy, reducing the number of applications to the tools that SMEs need the most. The Synerpy company actively competes in OSS through its open source ERP offer for companies of up to 500 employees, representing a serious alternative to the conventional licensing model.

Universities

The contribution of universities to OSS appears mainly linked to cooperative projects between the business world and universities. One example is the Opencirrus project, sponsored by HP, Intel and Yahoo,

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²⁸ According to Matthew Aslett, June 2008. <http://blogs.the451group.com/open-source/2008/06/26/open-source-tour-of-europe-germany/>

to create a test bank for designing and managing data centres in cloud-computing. The project involves the University of Illinois in Urbana-Champaign, the Technological Institute of Karlsruhe in Germany and the Infocomm Development Authority of Singapore.

The Polytechnic University of Hannover has recently developed an OSS-based application for use in the rehabilitation of athletes. The use of db4o and the Java platform have been one of the keys to the project, which has been helped by the familiarity of students with Java language.

Communities

As is to be expected from one of the most advanced countries in the use of OSS, Germany boasts an extensive community of developers. Especially active in Germany are the SUSE, Debian, KDE and OpenSolaris communities.

Several organisations attest to the existence of a vast community, such as "The German Unix User Group", an organisation of developers, security experts and network administrators; and Linux-Verband, whose mission is to expand the use of OSS and open standards in Germany.





The BerliOS project mentioned earlier provides documentation and general information about the OSS community and its projects. It represents the ideal platform for developers to find projects of interest to them.

4.1.2. France



Public Sector

With regard to OSS, since 2001, the Agency for Administration Development (ADAE)²⁹ has promoted the use of open standards and Linux in French Administrations, with this being considered in 90% of public tenders.

Taking into consideration the number of OSS-related policies, the number of projects and suppliers, and the number of departments in the French Administration that have adopted OSS, France is, along with Germany and Spain, one of the countries with the greatest level of OSS adoption.

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29 "EuroLinux Alliance: French Govt. Agency to Enforce Open Standards and Promote Open Source/Free software," November 21, 2001 <http://linuxtoday.com/developer/2001112102120PRLL>

United Nations Conference on Trade and Development, "E-Commerce and Development Report 2003," Chapter 4: Free and open-source software:

Implications for ICT policy and development. Pages 114-9. http://www.unctad.org/en/docs/ecdr2003ch4_en.pdf

ATICA - <http://www.atica.pm.gouv.fr/>

In 1999, the French Parliament considered a proposal to reinforce the use of OSS in the Public Administrations. The project, known as Project Lafitte, Trégouet and Cabanel, was not carried out in the end. A similar proposal was launched the following year by Congressmen Le Déaut, Paul and Cohen. They presented a proposal for Law 117, to increase the use of the Internet and OSS in the Administration, which was also rejected.

Following these unsuccessful efforts, in 2001, the French ATICA (currently the ADAE) announced that it was going to promote the use of open standards and OSS for electronic administration applications³⁰.

In 2002, the Administration's policies moved toward clear support for OSS, as is reflected by the publication of the guide "Guide de choix et d'usage des licences de logiciels libres pour les administrations"³¹ [Guide to the selection and use of open source software by the administrations]", the goal of which was to facilitate the selection and use of OSS by the Public Administrations. During this same year, the General Plan Commission published an analysis³² on the French software industry, in which it recommended that the Public Administrations promote the development of open standards and OSS. In 2002, the network of public hospitals in Paris migrated to Linux to reduce maintenance costs and as an instrument to homogenise its systems.

Among the activities conducted over the last few years, especially noteworthy are the declarations made in 2007 by the Ministry of Defence, in which it came out in favour of OSS projects, both those developed internally and those subcontracted.

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30 News article published on CNN.com <http://archives.cnn.com/2001/TECH/industry/11/27/french.open.source.idg/>

31 "Guía para la selección y el uso de las licencias de software libre por la Administración Pública" [Guide for the selection and use of open source software licenses by the Public Administration]

32 International Trade Administration, U.S. Department of Commerce, "European OSS Policy Initiatives"



These policies have been accompanied by the adoption of Linux by the Public Administrations. In the year 2000, the Ministry of Culture and Communications replaced proprietary software with Linux on some servers. In two years, 50 of the 300 planned servers were migrated.

In 2004, Paris studied the possibility of carrying out a migration similar to that of Munich. That same year, the government distributed AGORA, its OSS content manager, in order to standardise its websites³³, and the Ministry of Equipment and Transportation selected the Mandrakesoft company to migrate 1,500 servers to Linux between 2003 and 2005.

During the same year, the Ministry of Defence³⁴ contracted five suppliers to create a variation of Linux with a high level of security. In addition, the Family Assistance Agency migrated to Red Hat and JonAS, and the Ministry of Foreign Affairs implemented an application and a platform for web development in OSS.

In October 2004, approval was given for France's Atomic Energy Commission and China's Ministry of Science and Technology to collaborate in the development of OSS-based software³⁵.

In 2005, the Ministry of Agriculture and Fishing migrated 500 Windows NT servers to Mandriva, and in 2007 it migrated 400 more. In addition, the Revenue and Customs Agency implemented JBoss as part of the Copernic project.

There is no doubt that for many of these implementations, cost savings were the driving force behind the change and the adoption of OSS. In 2001, the Gendarmerie Nationale began to introduce OSS. In 2005, 80,000 computers were migrated to OpenOffice, with expected savings of €2m. Furthermore, since then it has been mandatory for all Customs

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33 "eGovernment in France," European Union Open Source Observatory, June 2005, <http://ec.europa.eu/idabc/servlets/Doc?id=21009>

34 <http://www.osor.eu/news?>

35 "France to collaborate with China on Linux," DesktopLinux.com, October 2004, <http://www.desktoplinux.com/news/NS3169048255.html>

Administration documents to be produced with ODF. Later, in 2008, the decision was made to migrate all new workstations to Ubuntu³⁶.

An important milestone in OSS development in France was the project to develop the region around Paris as a Centre of Excellence for OSS Development. Called "Paris, Capitale du Libre," it began at the end of 2006. The objective of this project is to develop the information technologies industry, which had suffered greatly from the flight of companies to low-cost locations. The OSS market in France grew by around 80% in 2007³⁷.

Institutional support for OSS continued, as demonstrated by the representative project in 2007 that began with the migration of 1,154 French parliament computers to Ubuntu, Firefox, OpenOffice, Mozilla Thunderbird, etc. and servers to Apache and Mambo Content Manager.

During 2008, the Ministry of Education reached an agreement with Mandriva to apply a 60% discount over the next four years to the adoption of Linux by teaching staff and other administrative personnel in 250 French schools and universities. In addition, 2,500 servers were migrated to Linux and the Ministry of Culture and Communications implemented OpenOffice, replacing Microsoft Office.

In 2008, a commission headed by Jacques Attali³⁸ came to the conclusion that OSS, broadband and IT security are very important factors for development. Furthermore, since the private software development companies are mainly American, the document proposes adopting OSS formats to generate a greater number of information technology and communications companies in France. OSS is more economical, may

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36 See http://www.osor.eu/case_studies/towards-the-freedom-of-the-operating-system-the-french-gendarmerie-goes-for-ubuntu

37 Report from the Consulting Firm PAC (Pierre Audoin Consultants) in "Software Libre para el Desarrollo del Tercer Mundo" [Open Source Software for Third World Development] by Jesús Javier Estepa Nieto, 2007

38 <http://www.liberationdelacroissance.fr/files/rapports/rapportCLCF.pdf>



In France, 67% of companies are using OSS.

be developed anywhere around the world and enables companies to achieve greater innovation. In 2008, Nicolas Sarkozy recommended that France increase its use of OSS and argued that tax incentives should be considered as a way of stimulating OSS development.

There are also abundant examples of OSS implementation at a local level (Arles, Grand Nancy, Lille, Val d'Oise, Marseille, Brest, Grenoble, Lyon, Rennes, etc.). Additional support for OSS development came about when a new OSS working group was set up within the "system@tic Paris-Region" competitiveness group. The aim of this group is to facilitate the creation of an ecosystem in the Paris area, in which SMEs and large companies, developers and universities all collaborate. Different projects are being carried out within the framework of this group.

Private sector

In the private sector, there are examples of large companies that base their key business processes on OSS-based tools. One such example is the implementation of MySQL in the retailers Franprix and Leader Price to manage their supply chain data and their product distribution platforms. Another example is Agence France-Presse, which has adopted an OSS-based management system, as have public companies like SNCF, La Poste and Gaz de France³⁹.

In the automotive sector, Peugeot and Citroën have installed Linux in nearly 20,000 workstations, and EMI Music France uses eZ Publish.

According to the Actuate survey, in 2009⁴⁰, 67% of the companies said that they were already using OSS, 1.1% were in the process of implementing it and only 6.7% had no plans for adoption.

According to a survey conducted by Actuate in 2008⁴¹, the most commonly used technologies are Linux (30%), Apache (30%), Eclipse (25%), Tomcat (25%), MySQL (24.3%), PHP (19.3%) and Mozilla (16.4%). The penetration of Eclipse in France is greater than in Germany, the United Kingdom and the United States. However, the use of JBoss is noticeably low.

In terms of niche market suppliers, of particular interest is the OW2 consortium, an initiative by Bull and INRIA. It is the largest not-for-profit middleware consortium in the world and is the result of merging ObjectWeb and Orientware⁴². The European members of the OW2 consortium are France Telecom, Bull, Thales and Inria. The consortium's main projects are Bonita, the eXo platform, JonAS and SpagoBI.

39 See other Nuxeo clients at <http://www.nuxeo.com/en/customers/>

40 Actuate: <http://www.actuate.com/download/OpenSourceSurvey/oss2009.pdf>

41 Actuate: Annual Open Source Survey <http://www.actuate.com/OpenSourceSurvey2008>

42 For more information, see <http://orientware.objectweb.org/xwiki/bin/view/Main/Members>



Universities

Among the ecosystems created around “system@tic Paris-Region” is the Codex project, in which Innovimax, Inria Grenoble, Inria Lille, Inria Saclay, François Rabelais University, Denis Diderot University and the University of Paris Sud collaborate; and the Couverture project, in which Adacore, Open Wide, Telecom Paristech and Pierre et Marie Curie University collaborate⁴³.

An important project resulting from a purely university-based initiative is the ESUP-Portail consortium, originally formed by 15 French universities, and ultimately including 80 universities, to create the digital education portal that enables information exchange among educational teams, students and families. The final objective is to establish a large community and ensure technological coherence and convergence in order to accelerate OSS use in French secondary education.

Communities

The importance achieved by OSS in French society, both in the public and the private sector, can only have been attained through a solid, active community of OSS developers within the country. OW2, Mandriva, Alfresco, Drupal and FUSE are important communities in France.



⁴³ For more details, see http://www.systematic-paris-region.org/fr/logiciel/t_5_Projets.html

CeCILL⁴⁴. It is compatible with both French law and the GNU GPL and was approved by the Free Software Foundation. CeCILL-B is similar to the BSD license, while CeCILL-C is more comparable to LGPL. This fact, along with the firm support for OSS shown by the French Administration, constitutes a solid base for continuing OSS development in France in the future.

4.1.3. Spain



Public Sector

In Spain, more and more Public Administrations, companies, universities and users are turning to OSS in order to reduce costs during the current economic crisis. Spain is “among the most active countries in the EU in terms of OSS adoption,” since many of the open code initiatives are being widely accepted in both the public and private sectors. In 2009, in its report “Worldwide Open Source Activity and Growth,” RedHat pointed out the fact that Spain is the second ranked country in the world in OSS activity, trailing only France and surpassing Germany and other countries that have traditionally been very strong in this area.

In Spain, most OSS projects in the administration have been carried out at the Autonomous Administration level, although the National Administration has also been responsible for initiatives and policies with a national impact and for implementing important OSS projects.

⁴⁴ For more information, see <http://www.cecill.info/index.en.html>



In the 2003 document “Criterios de seguridad, normalización y conservación de las aplicaciones utilizadas para el ejercicio de potestades” [Security, standardisation and conservation criteria for applications used for exercising powers]⁴⁵, the recommendation made was to use OSS whenever possible, as long as it meets the required needs. The Ministry of Public Administrations later published a guide with recommendations for adopting OSS in the Public Administrations.

In 2005, the guide “Software libre: Propuesta de recomendaciones a la Administración General del Estado sobre utilización del software libre y de fuentes abiertas [Open source software: Proposed recommendations to the General State Administration on the use of free and open source software]⁴⁶” was published, written by the National Government’s OSS Group, created by the Higher IT Council for the Promotion of the Electronic Administration, with the aim of formulating a set of recommendations regarding the use of OSS by the National Administration.

In July 2006, at the request of the Ministry of Industry, Tourism and Trade, the Council of Ministers approved the creation of CENATIC, the National Open Source Competency Centre. CENATIC is the Spanish Government’s only strategic project promoting awareness and use of OSS in all areas of society.

In 2006, the Spanish Parliament unanimously agreed upon a resolution urging the government to actively promote OSS⁴⁷ and its use in the Administration.

In 2008, the Ministry of Finance recommended the use of open standards when exchanging information⁴⁸, and that same year, a Parliamentary commission approved the “Law Regulating Electronic Access by

45 The latest version is dated June 2004 <http://www.csi.map.es/csi/pg5c10.htm>

46 For more details, see <http://www.csae.map.es/csi/pg5s44.htm>

47 <http://ec.europa.eu/idabc/en/document/6468/5934%20>

48 <http://www.osor.eu/news/es-finance-ministry-recommends-open-standards>

Citizens to the Public Administration” (Laecap), which ensures the right of Spanish citizens to use whatever software they wish to communicate electronically with the government⁴⁹.

The Schmitz Study covers several initiatives in the Spanish public sector⁵⁰ with regard to the implementation of Linux and other OSS applications in the Senate, the Nuclear Security Council, the Ministry of Internal Affairs and the Ministry of Justice⁵¹.

Among the projects undertaken by the National Administration in the area of OSS, of particular interest are the Virtual MAP of the Ministry of Public Administrations, which implemented Linux on 220 servers, and the Agrega project⁵², promoted by the Ministry of Industry, Tourism and Trade and by the Ministry of Education.

Among the regional initiatives, the projects carried out in Extremadura and Andalusia are especially noteworthy, although there are also important initiatives to implement OSS in other regions, such as Castile La Mancha, Catalonia, the Community of Valencia, Aragón, Asturias, Cantabria, the Balearic Islands, Madrid and Galicia.

In 2002, the most famous OSS implementation project, gnuLinEx⁵³ began in Extremadura, the objective being to ensure IT access for all citizens and to set up a regional intranet. Linex is a GNU/Linux distribution designed for use in the Administration and in schools. Later, in December 2004, Linux was chosen as the operating system for the Extremaduran Health System⁵⁴. One of the latest projects underway in

49 <http://www.osor.eu/news/es-congress-commission-forces-public-it-to-accept>

50 For more details on OSS in the Public Administrations, see “Software de Fuentes Abiertas para el desarrollo de la Administración Pública española” [Open Source Software for the development of Spanish Public Administrations] (2008) from the National Open Source Software Observatory and the “Libro Blanco del Software Libre en España (II)” [White Paper on Open Source Software in Spain (II)], by the Regional Government of Andalusia.

51 “Study into the use of Open Source Software in the Public Sector,” published in 2001 by the European Commission

52 For more details, see <http://www.proyectoagrega.es/default/Inicio>

53 For more details, see <http://ec.europa.eu/idabc/en/document/1637/470%20>

54 For more details, see <http://ec.europa.eu/idabc/en/document/4002/505%20>



the region is Sextante, a geographical information system (GIS) set up to meet the needs of the region's forestry department⁵⁵.

Guadalinux was created as a software distribution intended to ensure compliance with Decree 72/2003, in which the Regional Government of Andalusia opted for OSS as an instrument to promote the Knowledge Society in Andalusia. Guadalinux⁵⁶ is an adaptation of Ubuntu for use in schools, libraries and public Internet centres. The G-Forja repository was also created. In 2008, the Regional Government of Andalusia selected Alfresco as its content management application⁵⁷.

In 2003, the Regional Government of Valencia's Department of Infrastructures and Transport issued a call for tenders for the development of geographic information management software (GIS), referred to as Gvsig. The project is co-financed with European funds and will be released under a GPL license. It is available on its website for both users and developers. The project has crossed national barriers and an increasing number of magazines, websites, universities and organisations are touting its existence. LliureX⁵⁸ was created in 2004. The objective of this project by the Regional Government of Valencia's Department of Culture, Education and Sport is to introduce new information and communications technologies based on OSS into Valencia's educational system.

Other Linux distributions in Spain are: MAX, created by the Community of Madrid's Department of Education in 2002; AugustuX, by Aragón in 2003; MoLinux, from the Regional Government of Castile-La Mancha; LinuxGLOBAL from the Regional Government of Cantabria in 2004; Linkat, from the Regional Government of Catalonia's Department of Education in 2006; and recently, Asturix in Asturias.

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55 For more details, see http://www.osor.eu/case_studies/sextante-a-geographic-information-system-for-the-spanish-region-of-extremadura

56 http://www.osor.eu/case_studies/andalusia-floss-as-a-tool-for-the-information/?searchterm=guadalinux

57 <http://www.computing.es/Noticias/200804240009/Andalucia-apuesta-por-Alfresco-como-solucion-ECM-corporativa.aspx>

58 For more details, see <http://ec.europa.eu/idabc/en/document/3341/505%20>

Galicia launched its Forxa repository in 2007. Also noteworthy is the Trisquel GNU/Linux distribution, a project that began in 2004, under the auspices of the University of Vigo. Its main objective is the production of an operating system that is totally free, easy to use, comprehensive and with good language support. Current versions include translations into Galician, English, Spanish, Catalan and Basque; the next version will also include Chinese, French, Hindi and Portuguese. The Galician OSS Mancomún portal (Open Source Software Service and Reference Centre) was launched in 2008⁵⁹.



Spain leads the European countries in terms of legislation that promotes Open Source Software use.

Private sector

Among the most important Spanish suppliers are Openbravo, specialising in ERP and with offices in Barcelona and Pamplona; the Seville company BitRock, with offices in the United States; Octality, which recently announced an EMEA agreement with Silicon Graphics; Telefónica Research and Development, with more than 60 OSS projects; and Telvent, the first Spanish company to be listed on the prestigious NASDAQ market.

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59 For more details, see http://www.osor.eu/case-studies-and-idabc-studies/case_studies/docs/IDABC.OSOR.casestudy.mancomun.17.pdf



The ASOLIF National Federation of Open Source Software Companies has more than 150 affiliated companies and 8 regional associations, constituting the main private organisation dedicated to defending and promoting the interests of OSS business organisations.

Among the private initiatives, of particular interest is the Morfeo project, which includes players from all fields. Morfeo is a project led by Telefónica R&D, created in an OSS environment and focused on facilitating technology transfer among companies, generating social and collaborative networks among them, and serving as a support for new SMEs. It is a community that constitutes an ecosystem. Recognising that a single company cannot lead innovation processes by itself, the Morfeo Community acts as an incubator for R&D&I projects involving administrations, companies (SMEs and large corporations), technology centres and clusters, universities and research centres, as well as prominent users. Its success stems from the free licensing of the technology it develops.

Among its projects is EzWeb, a standard, open Web platform that enables users to build their own work environments by selecting, configuring, combining and interconnecting available applications to create a new application that may be distributed. The members of EzWeb are TID (Telefónica Research and Development), the CTIC Foundation (Information and Communications Technology Centre), INTERCOM, CodeSyntax, ITI (IT Technology Institute), Yaco, Gesimde, Alimerka, Treelogic, UPM (Madrid Polytechnic University), IMDEA (Madrid Institute of Advanced Studies), CENATIC and Integrasyes.

Universities

Besides the participation of universities in the Morfeo project, there have been other significant university contributions made to the development of OSS in Spain. The Open University of Catalonia (Universitat Oberta de Catalunya) began its first International Masters programme⁶⁰ in Open Source

60 http://www.uoc.edu/portal/english/la_universitat/sala_de_prensa/noticies/2006/noticia_005.html

Software in 2003. In addition, King Juan Carlos University collaborates in an Open Source Software Masters with Caixanova⁶¹. Similarly, the University of Extremadura offers a Masters in open source software⁶².

In the field of education, the SILU (Free University IT System) project was run by the Open Source Software Office (OSL) at the University of Las Palmas de Gran Canaria (ULPGC). It consists of a live CD with a whole series of programs of particular interest to university students. 23,000 copies of this CD were published and distributed to all students registered at ULPGC in 2004. A CD with OSS was also prepared for use with operating systems belonging to the Windows family, thus facilitating the first contact for users with OSS⁶³.

In addition, the Linux user group at Carlos III University is seen as a good training ground for OSS project collaborators⁶⁴.

Among the projects financed by the European Union under the Seventh Framework Programme for Research and Technological Development, the Complutense University of Madrid participates in the RESERVOIR project to develop an architecture that allows the deployment of an infrastructure built on open standards and new technologies for distributing services based on cloud computing. The infrastructure will permit the dynamic reassigning of virtual spaces to underlying physical resources to allow for the efficient use of resources and the provision of services to users as they need them. Also participating in this project are University College London, the University of Lugano (USI) and the University of Messina (UniMe) in the field of education; and in the field of business, important corporations in the world of Information and Communications Technologies, such as IBM, Thales, SAP and Sun Microsystems.

61 www.masterssoftwarelibre.com

62 <http://www.unex.es/eweb/msl/>

63 Libro Blanco del Software Libre en España (II) [White Paper on Open Source Software in Spain (II)] <http://creativecommons.org/licenses/by-nc-nd/2.1/es/legalcode.es>

64 http://observatorio.cenatic.es/index.php?option=com_content&view=article&id=432:grupo-de-usuarios-de-linux-de-la-universidad-carlos-iii-de-madrid-gul-uc3m-comparte-su-trabajo-con-el-onsfa&catid=50:entrevistas&Itemid=86



Communities

In Spain, there are many OSS community members with extensive experience in project leadership⁶⁵.

Among the most active communities in Spain are the Gnome, KDE, Ubuntu and Debian communities. GUL-uc3m is an association comprised mainly of students that seeks to promote OSS at universities, focusing mainly on students, but without neglecting university institutions. The main objectives of the Spanish Java community are the diffusion of Java technologies in Spanish and the promotion of OSS around these technologies.

GNOME Hispano is an association integrated within the GNOME Foundation whose purpose is to promote the use and maintenance of the GNOME desktop environment in Spanish. The KDE Spain community promotes the use of OSS, and specifically, the KDE desktop.

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65 Matthew Aslett, at <http://blogs.the451group.com/opensource/2008/06/27/open-source-tour-of-europe-spain/>

4.1.4. Italy



Public Sector

Until the year 2000, the Italian Government carried out practically no initiatives to support OSS. Until then, initiatives could be found in schools and in towns in certain regions, such as Trentino, in Tuscany. Following a proposal from Senator Millio, the Italian Senate studied an amendment to the financing law that ultimately resulted in a recommendation for OSS use⁶⁶.

In 2002, the Commission for OSS Use was created by the Public Administration to study OSS adoption⁶⁷. The Commission suggested that OSS use should be considered for electronic administration projects, as observed in the European Commission during the Fifth and Sixth Framework Programmes. Finally, the procedure was included in public tenders, and OSS use in the directive of 18 December 2003, referred to as Legge Stanca.

During 2002, OSS became a hot topic of debate in the Italian Government. This culminated in 2004 with the creation of a CNIPA (National Centre for Information Technologies in the Public Administration) working group, which published a document⁶⁸ with instructions on how to comply with the directive. The Italian OSS Observatory⁶⁹ was also created.

In 2007, Italy launched an OSS repository for Public Administrations, called the ASC or the Ambiente di Sviluppo Cooperativo⁷⁰, as a means for

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66 15 December 2000, Ref. 9.4885.564 <http://www.interlex.it/pa/emendam.htm>

67 <http://robertogaloppini.net/2006/12/22/italian-government-funds-to-sustain-open-source-innovation/>

68 http://www.cnipa.gov.it/site/_files/Rapporto%20conclusivo_OSS.pdf

69 http://www.ossipa.cnipa.it/home/index.php?option=com_content&task=view&id=14&Itemid=30

70 <http://robertogaloppini.net/2007/05/16/open-source-government-italy-launches-its-forge/>



co-developing open code applications with other Public Administrations, developers, research institutes, etc. However, as of 2009, it only housed around a dozen projects⁷¹.

The problem is that Italy is divided into 20 regions, each of which is currently free to establish its own laws, including those related to ICTs. Many of the regions have their own laws related to the public purchase of software and the adoption of open standards and OSS. This makes it difficult for there to be a clear policy on adopting this type of software in Italy.

According to statistics provided by the Italian Observatory, in 2006, 72% of the Public Administrations used OSS, while in 2007, this increased to 80%. Among the most important advantages of its adoption, 68% of the Public Administrations surveyed mentioned financial reasons.

In 2007, the Ministry of Reform and Innovation in the Public Administration announced the creation of a second OSS Commission to establish a public OSS purchasing guide, which was finally published in May 2008⁷².

With regard to implementation projects in the Public Administration, the greatest success stories include the Ministry of Justice⁷³, the Ministry of Economy and Finance⁷⁴, the Court of Auditors and the National Institute of Design and the Mint⁷⁵.

71 <http://robertogaloppini.net/2009/02/09/open-source-governance-state-of-the-art-and-lesson-learnt-in-italy-part-i/>

72 <http://www.innovazione.gov.it/ministro/salastampa/notizie/1022.htm>

73 <http://www.allbusiness.com/technology/software-services-applications-information/10525398-1.html>

74 <http://customers.redhat.com/2008/06/10/italian-ministry-of-economics-and-finance-powers-mission-critical-applications-with-red-hat-solutions/>

75 http://www.redhat.com/about/news/prarchive/2008/corte_dei_conti.html

In July 2007, the Italian Parliament's IT department presented a plan for the migration of 200 servers over to Linux and more than 3,500 workstations to OpenOffice. This migration will take place over approximately two years⁷⁶.

At a regional level, there are OSS projects in Cremona⁷⁷, Foggia⁷⁸, Rome, Tuscany, Emilia Romagna, Genoa, Bologna, Bolzano, Savona and Umbria⁷⁹.

Private sector

The Italian market has reached an important stage of maturity with regard to the adoption of corporate business solutions, especially in the areas of web servers, databases, operating systems and security.

The extent of OSS adoption in the Italian business sector is significantly higher in large companies, with a 38% penetration in the use of OSS operating systems, and lower among SMEs (10% in the segment of companies with less than 50 employees)⁸⁰. The main reasons given by companies for adopting OSS are the cost and the options for customisation.

In Italy, the number of OSS suppliers is gradually increasing. Prominent companies include SpagoBI, specialising in Business Intelligence, and service companies, such as Sourcesense. In the mobile phone software sector, the American company Funambol maintains its R&D centre in Pavia.

76 <http://www.osor.eu/news/it-parliament-to-switch-to-gnu-linux-and-open>

77 http://www.osor.eu/case_studies?

78 <http://www.linux.com/archive/articles/45714>

79 <http://www.osor.eu/news?>

80 Alessandro De Rossi, Vladi Finotto, Antonio Picerni. "Doing Business with Open Source: An analysis of Italian OSS Firms."



Universities

In the university sector, since 2008, the University of Perugia has offered a Masters in OSS⁸¹. The University of Bologna is a particularly active participant in research and development projects involving collaboration with companies. Among other projects, we might mention the SIRIA project, which led to the development of the GIS platform for archiving and managing archaeological information, which permits simultaneous access by several people to the same information over the Internet. The code has been released under a GPLv3 license.

The University of Bologna participates, along with the Universities of Milan and Trento, in the initiative for the development of the OW2 Consortium's Business Intelligence platform.

Equally important is the participation of the University of Laguno (USI) and the University of Messina (UniMe) in project RESERVOIR.

Communities

Several organisations are dedicated to promoting OSS in Italy, such as the Italian Linux Society, which promotes GNU/Linux and OSS in Italy, and the Italian Free Software Foundation. The Orvieto user group also promotes the use of Linux and the philosophy behind the GNU Project. In the commercial environment, active communities in Italy are the Linux, PostgreSQL, Plone, Mozilla and Sugar CRM communities.

81 <http://www.osor.eu/news/it-university-starts-open-source-master-course>

4.1.5. Norway



Public Sector

In 2001, the public company Statskonsult wrote a report recommending the use of OSS in the public sector and in education⁸². One year later, the Norwegian Government decided not to renew a contract with Microsoft to foster competition among software companies and, in particular, OSS⁸³.

In 2004, an independent advisory group also recommended that the government create pilot initiatives to stimulate OSS development in the country⁸⁴.

In 2007, the Norwegian Government decided that all documentation produced should be in ODF for editable documents, PDF when it was desirable to preserve the characteristics of the original document and HTML when it was public information on the Internet⁸⁵.

The government created the Norwegian OSS Competence Centre, Friprog, to advise the Ministry of the Administration and Government Reform. This centre provides advice on the use of OSS in both the public and private sectors, and also participates in the creation of OSS policies⁸⁶.

82 Statskonsult, "Open-source software," August 2001, <http://www.statskonsult.no/publik/rappporter/2001/2001-07eng.pdf>

83 Wired News, "Norway Says No Way to Microsoft," July 16, 2002 <http://www.wired.com/news/business/0,1367,53898,00.html>

84 "Software Policy for the Future," The Norwegian Board of Technology, December 2004, http://www.teknologiradet.no/files/english_summary_041223_copy.pdf.

85 "Norwegian Standards Council Recommends Mandatory use of ODF and PDF," May 13, 2007 <http://www.consortiuminfo.org/standardsblog/article.php?story=20070513180219689>

86 http://www.osor.eu/case_studies/independent-advice-norways-friprog-competence-centre



***46% of Norwegian companies use
OSS in their organisations.***

In 2008, the Norwegian Government allocated funds to stimulate the use of OpenOffice in order to reduce its dependence on proprietary software⁸⁷.

At the local level, the projects carried out in the cities of Oslo and Bergen are especially noteworthy.

In 2003, the city of Oslo announced its intention to migrate all schools to Linux, integrating it into the municipal administrative systems⁸⁸. One year later, the city of Bergen decided to migrate its servers dedicated to education and healthcare to SuSe Linux Enterprise⁸⁹.

Another example of successful OSS implementation in the Public Administrations is the FriKomPort project. The Norwegian region of Kongsberg launched an OSS-based portal to coordinate and manage training. Other areas of the country expressed their interest, and finally it was published with a GPL license.

87 <http://www.msnbc.msn.com/id/27768462/>

88 "Linux in Oslo high schools," 2003 <http://www.a42.com/node/399>

89 "Norway's second city embraces Linux," ZDNet UK, June 15, 2004. <http://news.zdnet.co.uk/0,39020330,39157677,00.htm>

The Skolelinux project began in 2001. Skolelinux is a Norwegian OSS project specifically for schools. Skolelinux has been implemented in more than 200 educational centres throughout Germany and Norway.

Private sector

Private sector adoption of OSS is average, and it is expected that OSS penetration in this sector will increase. A survey conducted by TSN Gallup for Sun's MySQL in 2009⁹⁰ showed that 46% of Norwegian companies use OSS in their organisations, a rate that matches the average for the Nordic countries.

The main companies developing OSS in Norway are Redpill-Linpro, Freecode, Ez Systems, Qt Software and Moava.

Universities

The Norwegian University of Science and Technology plays an important role in projects involving OSS development. The University of Bergen and the University of Oslo also make important contributions.

Communities

The Norway User Group and SkoleLinux are two of the most important organisations promoting OSS in Norway. The OSS Development Community in Norway makes a very valuable contribution, as the high cost of qualified labour in this country encourages the reuse of available OSS.

Redpill-Linpro, Freecode, Ez Systems, Qt Software, Moava, Drupa and Alfresco are the main communities of commercial OSS developers in Norway.

90 TSN Gallup for Sun's MySQL: Open Source Software Barometer 2009 Nordic and Benelux Report.



4.1.6. United Kingdom



Public Sector

In 2003, nine government agencies tested OSS to measure the effectiveness and the costs/benefits of systems based on open sources⁹¹.

That same year, the e-Envoy Office and the British Department of Trade and Industry (DTI) declared that the government's default position was to adopt OSS licenses in accordance with the definition from the OSI (Open Source Initiative) or other similar licenses⁹². Later, based on these experiences, the British Office of Government Commerce (OGC) published a "Proof of Concept" report which concluded that OSS is a viable, credible alternative to proprietary software and recommended that the public sector consider development and migration to OSS⁹³.

In 2004, the OGC drew up a proposal, approved as the policy on OSS use, in which the government specified that the selection of software in

the Public Administrations must be based on the price-quality ratio of the offer, with the British Government showing no preference for OSS⁹⁴.

In 2005, the government agreed to sponsor research at the National Computing Centre into applications based on open source code for the public sector⁹⁵.

In spite of the government-issued policies and reports, to date it has remained quite neutral with regard to the use and promotion of OSS. Only recently has a policy been presented that clearly promotes the use of OSS⁹⁶. The most significant examples of OSS implementation in the public sector are those by the city of Birmingham, Powys County, the BBC and the National Health Service (NHS).

The city of Birmingham migrated 330 workstations in its libraries to Openoffice, Gimp and Firefox⁹⁷.

The Powys County Council implemented a server with OSS in schools to facilitate the access of all students in the county to the Internet and e-mail. OSS had previously been installed on local council web servers.

91 Computer World, "Nine British government agencies to test open-source software," Todd R. Weiss, October 2003 <http://www.computerworld.com/softwaretopics/os/linux/story/0,10801,85896,00.html>

OGC News Release, October 2003: http://www.ogc.gov.uk/application.asp?app=press_release.asp&process=full_record&id=1000030

Final report: "Government Open Source Software Trials," October 2004 <http://www.ogc.gov.uk/index.asp?id=2190>

92 International Trade Administration, U.S. Department of Commerce, "European OSS Policy Initiatives."

93 Office of Government Commerce, OSS Page <http://www.ogc.gov.uk/index.asp?id=2190>

Case Study: http://www.ogc.gov.uk/embedded_object.asp?docid=1000435

Final report: http://www.ogc.gov.uk/embedded_object.asp?docid=1002367

OSS Policy Document : http://www.govtalk.gov.uk/documents/oss_policy_version2.pdf

94 "Open Source Software Use within UK Government, Version 2," e-Government Unit, October 2004. http://www.govtalk.gov.uk/documents/oss_policy_version2.pdf

2002 Office of Government Commerce OSS Procurement Guide: http://www.ogc.gov.uk/sdtoolkit/reference/ogc_library/procurement/OSSGuidance.pdf

Office of Government Commerce, Open Source Software page. <http://www.ogc.gov.uk/index.asp?id=2190>

OSS Trials Final Report (October 2004): http://www.ogc.gov.uk/embedded_object.asp?docid=1003914

95 Robert Jaques, "UK Government turns to open source," VNUNET.com, June 20, 2005. <http://www.vnunet.com/vnunet/news/2138325/uk-government-turns-open-source>

96 "The UK Government beefs up its open-source policy," published by Gartner, 2008.

97 <http://www.silicon.com/management/public-sector/2006/03/02/academy-builds-business-case-for-linux-in-govt-39156889/>



A group of programmers in the R&D department at the BBC developed a tapeless recording system for PCs using OSS, called Ingex, that takes advantage of the benefits of cheap storage and high processing power. They released it under a GPL license.

In 2004, the National Health Service (NHS) decided to migrate 5,000 computers to the Java Desktop System (JDS). It signed an agreement with Sun Microsystems to carry out a pilot test⁹⁸. Later, at the end of 2005, it signed another agreement, this time with Novell⁹⁹, to implement SuSe Linux Enterprise Server in order to save €83m over three years.

Private sector

The British private sector continues to be quite reticent with regard to OSS use. In its report on the United Kingdom (June 2009), Survey Interactive stated that 42% of the companies surveyed already used OSS and 22% were considering it. The rate of OSS adoption by SMEs in the United Kingdom was 34%, according to a survey conducted by TNS Gallup for SUN's MySQL in 2009¹⁰⁰.

In the financial sector, the adoption rate appears to be somewhat higher. According to a 2008 Actuate survey¹⁰¹, 46.7% of the companies responded that they were already using OSS, 3.3 % were in the process of implementing it and only 10% had no plans for adoption.

98 http://www.theregister.co.uk/2003/12/08/uk_nhs_trials_sun_linux/http://www.theregister.co.uk/2003/12/08/uk_nhs_trials_sun_linux/

99 http://www.opensourceacademy.gov.uk/news_and_events/news/open-source-in-the-nhs-a322-million-contract-awarded-to-novell

100 <http://www.h-online.com/open/news/item/Survey-UK-SME-s-low-adoption-level-for-open-source-812350.html>

101 Actuate: Annual Open Source Survey <http://www.actuate.com/OpenSourceSurvey2008>

Universities

Universities in the United Kingdom participate very actively in the world of OSS, making a very valuable contribution, with high levels of participation by professors, researchers and students alike on numerous projects.

The Universities of Edinburgh, Glasgow and Aberdeen have important OSS research programmes financed by outside funds. The University of Edinburgh won the OSS Award in Scotland in 2008. One of the greatest contributions from the University of Edinburgh to OSS has been the development of “OGSA-DAI middleware,” which supports the consolidation of massive databases from large-scale computing resources in different locations. This software is used in e-science projects worldwide.

The knowledge generated by research and the OSS-related capacity of the professors involved in the research programmes is transmitted to the students through its presence on the curriculum offered by the IT faculties. On the other hand, where universities do not have these externally-financed programmes, OSS courses tend to be minimal.

The University of Lincoln provides its students with the option to participate in OSS development projects. The OSS Research Centre coordinates the CODEX (Collaborative Development for the XO Laptop) projects to create resources that permit students to develop applications on their XO and SoMOSS laptop computers, focusing on instant messaging software architecture. A clear success of these projects is that the student-researchers greatly benefit from the interaction with the OSS community, from whom they receive continuous support.



Among the most important projects financed by the European Union under FP7¹⁰² involving universities in the United Kingdom is the P2P Next generation Peer-to-Peer Content Delivery Platform project, involving a consortium of academic institutions and companies from the sector aiming to develop a new open standard-based platform for content exchange using the P2P paradigm, with a vision focused on the user, regardless of place and time. The University of Lancaster and the Kendra Foundation participate, along with other institutions from the country, such as the BBC and Pioneer's Digital Design Centre, and institutions from other countries, such as the European Broadcasting Union, Markenfilm European Broadcasting Union and VTT's Technical Research Centre in Finland.

The Moodle Programme at the British Open University (UKOU) has also been successful, with more than 200,000 students and 7,000 professors. Among the factors behind the project's success is the continuous contribution made by the Moodle community to the implementation and ongoing improvement of the platform. This project benefits from special funding by the William and Flora Hewlett Foundation.



In 2007, the Finance Ministry migrated to OpenOffice in 10,000 workstations.

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102 The European Union's Seventh Framework Programme for the Research and Development of Information and Communication Technologies.

Communities

The Open Source Consortium is the organisation in charge of promoting the use and implementation of OSS, especially in the public administration. Red Hat, Ubuntu and Alfresco are some of the most active communities in the United Kingdom.

JASIG is a consortium of academic and commercial institutions that supports OSS projects for the education sector. JISC finances OSS Watch, an observatory that provides independent advice on OSS use, development and licensing. OSS Watch can help generate communities for OSS-based projects.

4.1.7. Finland



Public Sector

In order to promote the use of OSS, the Finnish Government has carried out a series of initiatives focused particularly on practices in the Administration. Even though the government has not developed a national policy for OSS, it has recommended its use for years now. In 2003, the Finance Ministry issued a report containing recommendations regarding OSS use¹⁰³, which stressed the need to ensure access to source code for customised developments and favoured the use of open interfaces and standards. It suggested the use of OSS implemented in the market as an alternative.

That same year, the creation of the Applied Linux Institute was announced, with collaboration from three public institutions: the Department of Communications, the Institute of Adult Education at the University of

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103 "Recommendation on the Openness of the Code and Interfaces of State Information Systems," Ministry of Finance working paper, October 2003. http://www.vm.fi/vm/en/04_publications_and_documents/01_publications/04_public_management/20031015Recomm/name.jsp



Helsinki and the Department of Education in the city of Vantaa¹⁰⁴. Its objective is to promote the use and development of OSS around the world, particularly in developing countries.

The Centre for Open Software Solutions (COSS) was founded to promote OSS in the public and private sectors¹⁰⁵.

An example of a mass migration is that of the Ministry of Finance, which migrated 10,000 workstations to OpenOffice in 2007¹⁰⁶, and made the “Open Office Portable-package” publicly available, this being a collection of various OpenOffice templates and documents.

The government has been criticised¹⁰⁷ for its lack of interest and support for OSS, despite many towns demanding OSS solutions.

For example, the cities of Oulu, Tampere and Lahti are migrating to OSS to increase interoperability and reduce costs. Furthermore, public tenders are increasingly written in such a way that they include OSS suppliers.

Private sector

Since 1997, the University of Helsinki and the University of Turku have conducted an annual survey measuring OSS use in Finland. The data published in 2008 showed that 75% of private companies in Finland use OSS (in 2000, this figure was only 13%)¹⁰⁸. In the opinion of the

104 Linux Journal, “Finland Works on an Applied Linux Institute.” Frederick Noronha, September 2003. <http://www.linuxjournal.com/article.php?sid=7110>

105 COSS Competence Centre Finland: More than just five guys holding a torch http://www.osor.eu/case_studies/docs/IDABC.OSOR.casestudy.COSS.pdf

106 <http://www.osor.eu/news/fi-ministry-of-justice-migrates-to-openoffice>

107 http://www.valimaki.com/org/open_source_municipalities.pdf

108 <http://www.osor.eu/news/fi-companies-using-open-source-spurs-public-administrationsSEnS>



COSS¹⁰⁹, this trend is positively influencing the IT strategy of the Public Administration¹¹⁰. In a survey conducted by TNS Gallup for Sun’s MySQL, Finland has the highest degree of OSS use among the Nordic and Benelux countries, with 54% of large and medium companies using it, as opposed to an average of 46% for the Nordic countries and 41% for the Benelux countries¹¹¹.

Universities

There is a long tradition of collaboration between universities and private companies in the area of OSS-based research and development.

Proof of this is FILOSI (Finnish Linux and Open Source Initiative), a joint-venture between academic institutions and business organisations to promote the research and development of open source technology in Finland.

109 Fossbazaar’s partner <http://www.osor.eu/news/fi-open-source-resource-centre-joins-linux-foundation-working-group>

110 <http://www.osor.eu/news/fi-companies-using-open-source-spurs-public-administrations>

111 http://www.mysql.com/news-and-events/generate-article.php?id=2009_10



Helsinki Technology University and the Helsinki Institute for Information Sciences participate actively in one of the projects financed by the European Union within the scope of the Seventh Framework Programme, the PSIRP, to develop, implement and validate an Internet architecture based on the “publish-subscribe” paradigm. The project results will be implemented under a free license that will permit SMEs to use them to develop their own applications. Nokia Siemens Networks and Ericsson also participate in this project, as well as universities and private companies from seven other countries, such as the University of Economics and Business in Athens (Greece) and British Telecommunications (United Kingdom).

Communities

The Debian and Ubuntu communities are especially active in Finland. In terms of developers per million inhabitants, Finland has 3.93 developers per million, as opposed to 0.7 in the United States, the largest community in absolute terms¹¹². The Debian community has carried out important initiatives focused on local adaptation, closely linked to OSS adoption by local governments. The high level of activity of the local community of Ubuntu users should also be mentioned. Most developers in the Debian community also belong to the Ubuntu community.

4.1.8. Denmark



Public Sector

The Administration's involvement in using and promoting OSS has evolved since October 2002, when the Ministry of Science, Technology and Innovation published the conclusions drawn from the analysis

conducted by the Danish Technology Council, which recommended that OSS compete with proprietary software on a level playing field. Accordingly, it recommended carrying out OSS pilot projects.

In the same month, the Danish Technology Council published a report suggesting that the Public Administration could save as much as €500m over four years by using OSS. The report also concluded that OSS should not be imposed as a general requirement.

In November 2002, the socialist members of the Danish Parliament introduced a motion supporting an offensive competition strategy in favour of OSS use and open standards. The motion failed to obtain the necessary support within parliament and it has been reported that it will not be reintroduced for a second vote.

In June 2003, the Danish Government adopted a software policy to protect and encourage competitiveness, freedom of choice and interoperability among different software suppliers. While this policy does not refer to OSS use, a large number of OSS projects were begun under its auspices.

In June 2007, the parliament gave approval for government agencies to have ODF and Open XML. The parliament itself and a third party will evaluate the pilot programme in 2009. This regulation is the outcome of the Danish Technology Council's “Open Source Software in e-Government” report, which recommended that the government play an active role in promoting open standard formats as alternatives to proprietary formats.

The result of this pilot project will mark a move towards consolidating OSS in the Danish Public Administration, giving a decisive boost to OSS in the country.

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112 <http://www.linux-magazine.com/Online/News/Where-In-the-World-Are-the-Most-Debian-Developers>



Private sector

The rate of OSS adoption by private companies is considerable, reaching a penetration rate of 44%, a figure that slightly trails the average adoption rate for the Nordic countries (46%), according to a survey conducted by TSN Gallup for Sun's MySQL¹¹³.

The Nemhandel Initiative (NITA), a public project, has developed an OSS application for the electronic exchange of business documents. The intention behind this initiative is to stimulate its use by private companies, thereby introducing OSS into the private sector. Commercial suppliers, banks and network operators are also connecting their networks to the NemHandel infrastructure, which will facilitate the expansion of its use in the private sector.

Universities

The University of Aalborg participates in the European ASPIRE project under the European Union's Seventh Framework Programme. This university also participates in the OPEN (Open Pervasive Environments for Migratory Interactive Services) project. This project is intended to develop middleware that will allow interoperability among existing technologies. Companies participating in this project are NEC, Vodafone and SAP.

Communities

Dotsrc.org is a non-profit organisation founded in 1995 as part of Sun Microsystems' SunSITE programme, in collaboration with Aalborg University and the Danish Research Network. The organisation focuses on hosting services for the OSS community.

The Ubuntu community is one of the most active in the country. The Skåne Sjælland Linux User Group (SLUG) is probably the largest community in the Nordic region, with nearly 5,000 members.

113 TSN Gallup for Sun's MySQL: Open Source Software Barometer 2009 Nordic and Benelux Report

4.1.9. Holland



Public Sector

In 2007, the Dutch Government decided that all its agencies will use OSS, and that all government organisations needing to continue using proprietary software and formats must justify this use and prepare a plan with a deadline for migration to open standards and OSS. From 2009, the regional and local administrations will also be required to comply with this regulation.





Important OSS-related decisions have been made over the last few years at a government level. In the Public Administrations, it is now mandatory to use open standards to exchange digital information. OSS is preferred when acquiring software. With these goals, the national government's NoiV programme is working to make this change possible.

In 2006, Amsterdam City Council commissioned a study on OSS use in the Public Administration. This study indicated that the use of OSS led to greater independence from suppliers, enabled better information exchange and storage, and was free from financial and logistical risks. This study led to two great advances, and as such was the cornerstone for incorporating OSS into the Public Administration. Firstly, Amsterdam City Council announced in December 2006 that it had allocated €300,000 of its budget to testing OSS in the Administration of two city districts in 2007. This pilot project consisted of replacing Microsoft Windows and MSOffice with OSS in workstations.

The second great advance involved nine Dutch cities, among them Haarlem, Groningen, Eindhoven and Nijmegen, which came together to sign the so-called “Amsterdam’s manifesto for open software in government.”¹¹⁴

In the case of Groningen, in 2008, its City Council decided not to renew its licensing contract with Microsoft for the use of Microsoft Office, instead promoting the migration of all its systems to OpenOffice suite. According to City Council data, the community would save €300,000 in the first year, and it is calculated that completing the migration to OpenOffice would mean an investment of approximately €160,000, around half the cost of renewing its licenses with Microsoft.

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114 Amsterdam Manifesto in favour of Open Source Software in the Public Administration

Private sector

Holland does not have a significant level of OSS penetration in the private sector compared to other European countries, such as the Nordic countries. The lack of business management applications adapted to the local market halts progress in the adoption of OSS by SMEs. Hippo is the main OSS distributor in the Netherlands.

Universities

Universities in the Netherlands participate in several projects financed by the European Union as part of the Seventh Framework Programme for Research and Technological Development.

The University of Tilburg takes part in the project “Software Services and Systems Network,” to establish an integrated, multidisciplinary community of researchers to determine the conditions for the Internet of the future, based on software services, while Delft Technical University collaborates in the P2P project. It also takes part in the PETAMEDIA project – Peer-to-Peer Tagged Media, which will use OSS for research tests on the Tribler application.

Communities

The HollandOpen Foundation intends to be a platform for all OSS initiatives and open standards in the Netherlands. Among its objectives is encouraging the exchange of knowledge among the different local initiatives. Ubuntu and Apache both have important communities in the Netherlands.



4.2. NORTH AMERICA

North America represented more than 30% of the ICT market worldwide in 2007, although its modest growth (around 4% over the last two years) reflects very sharp disparities from sector to sector. While electronic products and the IT sector are still experiencing growth, the telecommunications sector is showing a more modest increase. The North American market leads in the software, consumer electronics and audiovisual services sectors. The North American market is also characterised by its particularly high ICT expenditures in R&D, which exceed those of Japan and Europe combined.

In the field of OSS, North America has led in initiating the movement. There has been no firm commitment from the Public Administration in either the USA or Canada to promote the adoption and development of OSS, although different states in the USA have been active in promoting open sources, for example with proposed Law 2892 in the state of Oregon and Law 1579 in the state of Texas. In the United States, the White House has already expressed its opinion on OSS and the adoption of Drupal as CMS, and the Defence Department has issued a statement clarifying the military position on OSS use.

Private initiative has been successful in creating business models through the generation of OSS, such as Red Hat, Apache and Windriver, and the great American software giants such as IBM and Sun Microsystems have integrated community operations into their business models, recognising the added value that the community provides to software development.

With regard to the North American countries, the United States is considerably ahead of Canada, with the latter country constituting a follower in the region, benefiting from the advances and the OSS communities created in the United States.

The following section presents a detailed look at the current state of OSS in two of the countries in the region: the United States and Canada.

4.2.1 United States



Public Sector

In order to analyse the main factors contributing to OSS adoption in American society, we shall begin with government initiatives supporting OSS. It should be pointed out that, in spite of the competences that the states have in administrative and legislative matters, the first steps of an informational nature are taken at the federal level.

Accordingly, in October 2000, the President of the ICT Advisory Council (PITAC)¹¹⁵ wrote a report for the president, “Developing Open Source Software to Advance High-End Computing,” where he recommended that the Federal Government promote the development and use of OSS, ensure that the rules of the game were the same for OSS as they are for proprietary software in public tenders, and analyse existing OSS licenses.

Another report, “Developing an Open Source Option for NASA,”¹¹⁶ stated that the use of OSS at NASA would lead to an improvement in software development, strengthen collaboration and result in more efficient and effective dissemination.

In 2001, the OSI (Open Source Institute) was founded with the mission to promote the development and implementation of OSS in the government at federal, state and local levels. The organisation acts as a facilitator between the public and private sector. Even though it is closely affiliated with the Defence Department, its interests apply to all sectors of government. More than 1,000 persons are on its mailing list and it has 16 sponsors.

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115 <http://www.nitrd.gov/pubs/pitac/pres-oss-11sep00.pdf>

116 <http://www.nas.nasa.gov/News/Techreports/2003/PDF/nas-03-009.pdf>



The rules for OSS use at the DoD (Department of Defence) were approved in 2003¹¹⁷. The memorandum urges DoD agencies to use OSS whenever it meets National Telecommunications Security and National Information Systems Security requirements, as well as DoD regulations.

The OSS Public Sector Project also began in 2003, backed by the Commonwealth of Massachusetts, in collaboration with the Massachusetts Institute of Technology, to facilitate the reuse of software developed by the public sector¹¹⁸.

The following year, the Office of Management and Budget (OMB) approved a memorandum requiring the purchase and maintenance costs of software to be considered in public sector purchasing processes, in addition to security and information privacy factors¹¹⁹.

In 2003, the State of Oregon presented the proposal for Law 2892, which requires state agencies to consider the use of OSS for all new software acquisitions. Similarly, the State of Texas presented a proposal for Law 1579 that same year, with the same aim. In 2004, the State of California approved the recommendation to implement OSS whenever possible in state agencies¹²⁰, and the State of Hawaii approved the launch of a pilot project to implement OSS in the Department of Education¹²¹.

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117 http://www.google.es/search?hl=es&source=hp&q=Open-source+software+gets+nod+from+DOD&btnG=Buscar+con+Google&meta=&aq=f&oq=&rlz=1R2ADFA_esES336

118 <http://ecitizen.mit.edu/opensource/index.html>

119 "Software Acquisition," M-04-16, July 1, 2004. Karen S. Evans and Robert A. Burton. <http://www.whitehouse.gov/omb/memoranda/fy04/m04-16.html>

120 http://news.zdnet.com/2100-3513_22-137841.html

121 HB1739, Hawaii State Legislature, 2004: <http://www.capitol.hawaii.gov/session2004/status/HB1739.asp>, http://www.capitol.hawaii.gov/session2004/bills/HB1739_HD1_.htm

An important landmark occurred in 2004, when for the first time in the United States, a federal agency forming part of the Labour Department released software under a GPL license¹²². After this, several states¹²³ joined forces in the Government Open Code Collaborative (GOCC), creating a virtual space for voluntary collaboration between the public sector and not-for-profit academic institutions. The objective was to encourage the creation of a common repository of open code and best practices developed by the public sector. At the moment of its greatest activity, the GOCC had 20 members, but only played an active role in the States of Massachusetts, Rhode Island and Texas. However, the GOCC, has recently ceased to play an active role. The reasons¹²⁴ given for this are basically the lack of time on the part of its volunteer members and the lack of dedicated resources.

In 2005, the State of Oregon¹²⁵ approved a budget of €1.2m to create the Open Technologies Business Centre (OTBC), intended to facilitate the creation of OSS businesses. The Centre hosts the Open Source Development Labs, a consortium of Linux companies.

That same year, the State of Massachusetts approved the mandatory use of ODF. However, in 2007, it also included the Open XML format¹²⁶.

As examples of projects involving OSS, we might mention those carried out by the US Department of Veterans Affairs, which has developed

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122 <http://www.linuxjournal.com/article/7622>

123 KS, MA, MO, PA, RI, UT, VA, WV

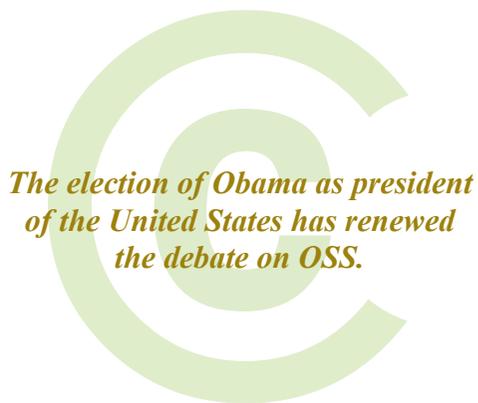
124 <http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2313/2065>

125 CNET news "Oregon angles for open-source businesses," Stephen Shankland 2005. http://news.com.com/Oregon+angles+for+open-source+businesses/2110-7344_3-5551502.html

126 <http://www.macworld.com/article/58721/2007/07/openxml.html> and http://news.cnet.com/Microsoft-document-formats-gain-Mass.-favor/2100-1013_3-6194542.html?tag=nefd.top



an EHR (Electronic Health Record) system, the VistA¹²⁷ (Digital Health Record System), in order to improve the quality of the medical system used by veterans. Different versions of VistA are already being used in the Defence Department's Military Health System, in the Health Department and the Native American Health Service in Alaska. Outside the United States, this system has been implemented in the Mexican Social Security Institute, the Cardiology Institute in Berlin and the National Cancer Institute at the University of Cairo.



In February 2009, various companies and players in the sector wrote a charter¹²⁸ for President Obama, asking him to consider OSS, arguing that it could reduce costs in the health sector, for example. Companies that have already signed this include Collaborative Software Initiative, Alfresco, Novell, OpenLogic, Red Hat, Unisys, Talend, MuleSource and CSI, among others.

In January 2009, President Obama requested a report from the president of Sun Microsystems, Scott McNealy. According to McNealy's report, "The government should authorise the use of OSS products to improve

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127 <http://worldvista.org/AboutVistA>

128 <http://consideropensource.blogspot.com/2009/02/to-president-obama-please-consider-open.html#comments>

security, obtain better quality software, reduce costs and achieve greater reliability — all the benefits represented by OSS."¹²⁹

In November 2009, the official US White House website migrated to Drupal, an OSS-based content manager. After several months of planning, the Obama administration decided to replace the proprietary system it was using with the latest version of Drupal. The President had already declared himself a "fan" of OSS even before being elected, supporting ODF open formats¹³⁰ in 2007 when he used OSS during his campaign¹³¹.

The government still has not taken a position in this regard¹³², and the proprietary software lobby is putting pressure on them. One example is the Business Software Alliance, created in 1988 by private companies.

Private sector

According to a 2009 Actuate survey¹³³, 41% of the companies stated that they were already using OSS, 5.6% were in the process of implementing it and only 11.8% had no plans for adoption. The most commonly used OSS technologies were Apache (43.2%), Tomcat (31.5%) and MySQL (30.7%).

The real driving force behind the launching and adoption of OSS in the United States has been the appearance of OSS product and service providers with a profitable, sustainable economic model.

One example is Red Hat, a distributor of OSS with support. Red Hat's business model is based on a service subscription model, providing maintenance and technical support for the OSS it markets. Novell is

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129 http://news.cnet.com/8301-13505_3-10147920-16.html

130 <http://www.eweek.com/c/a/Linux-and-Open-Source/Obama-Voices-Support-for-ODF/> <http://blogs.the451group.com/opensource/2007/11/21/what-exactly-are-universally-accessible-formats/>

131 <http://www.linuxjournal.com/content/obamas-secret-weapon-geeks-lots-them>

132 <http://blogs.the451group.com/opensource/2009/01/21/obama-administration-seeks-advice-on-benefits-of-open-source/>

133 Actuate: <http://www.actuate.com/download/OpenSourceSurvey/oss2009.pdf>



another OSS distributor. This American company entered the OSS distribution business through the purchase of companies such as Ximian and SuSE in 2003.

We can also report that large competitors in the Information Technology Industry (IBM, ORACLE, HP, etc.) are entering the field of OSS. There are also many OSS companies, such as Alfresco, Windriver, BlackDuck, Ingres, Pentaho, Zenoss, Liferay and Navica, for example.

In 2009, a group of the largest technology companies worldwide, including Google, Red Hat, Oracle, Novell, Canonical and AMD, as well as associations, non-governmental organisations, the OSS community and research entities, formed a group called OSFA (Open Source For America). The group's aim is to explain the benefits of adopting OSS in the administrations, thereby achieving a level playing field between OSS and proprietary software in bidding processes. The group hopes to obtain the federal certifications necessary to be able to participate in all software and service tenders for US administrations, including high-security computing projects.

The combination of increasing governmental, institutional and educational support and the determined entry of major competitors from the Information Technology industry in the field of OSS will undoubtedly result in more widespread adoption of OSS in North American society.

Universities

Most OSS companies have sought involvement from universities in OSS communities and projects, aware of the contribution they may make to OSS in terms of knowledge.

Sun Microsystems is one of the suppliers that has carried out activities with the academic community¹³⁴. An example of this is the OSUM (Open Source University Meetup), a community where thousands of university students and professors meet to form groups at different universities around the world, where they share and disseminate OSS knowledge. There are forums dedicated to technologies such as Java, OpenSolaris, OpenSPARC, MySQL, NetBeans, GlassFish and OpenOffice; and on-line courses, advice, webinars and on-line conferences with specialised Sun Microsystem engineers are also organised.



The person who until 2007 was CEO of Open Source Development Labs (ODSL) founded the Collaborative Software Initiative that same year. This initiative is the result of his conviction that an opportunity exists to use communities as a platform for developing OSS solutions. As a result, CSI sells and provides support for solutions developed by teams using collaboration tools such as CollabNet, with open platforms, that are less costly for their users to implement and maintain. In 2008, it launched TriSano, an application and an OSS community for the health sector. This is a citizen-oriented monitoring system for managing infectious diseases, which enables local, state and federal authorities to track, control and prevent disease and death.

134 <http://blogultura.com/tecnologia/osum/>



The universities are also in the process of adopting OSS and providing support for its development. We can see examples of universities that support desktop Linux (Boston University, University of Indiana, MIT, Princeton University, University of Washington, etc.) and universities that offer Linux training courses (MIT, UCLA, University of Washington, etc.)¹³⁵.

MIT has carried out a complete study on whether Linux should be extended throughout the entire university. Titled "IS Support of Linux at the Desktop", it is based on user and institution interviews and its conclusion is that "the MIT community is ready to embrace Linux as a third desktop operating system." As a result, the university is accelerating its free Linux support, beginning with student laptops.

The OSS Laboratory at the University of Oregon (OSUOSL) supports different communities and projects based on open sources and code, such as Linux, Apache, Gnome and Mozilla, providing companies the resource capacity they were previously unable to obtain, as well as fast, secure services.

A few universities have conducted surveys of Linux use among staff and students. At MIT, 22% of the students used Linux on their computers in 2000; at New Mexico Tech, 20% of the teaching staff used Linux on their work computers in 2002; at the University of North Carolina, 15% of those responding to the survey in 2002 preferred Linux; at the University of Maryland, 13% of survey respondents used Linux; at the University of Texas, 8% of those surveyed used Linux in 2000; and at Harvard, 4% of the students used Linux in 2001. Generally speaking, it seems that Duke, Yale and MIT are leading the pack in terms of Linux use.

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135 The case for Linux in Universities <http://www.kegel.com/linux/edu/case.html>

There is no doubt that the incorporation of universities into the world of OSS will contribute to consolidating and extending the use of OSS in American society, and their participation in OSS projects will enrich the projects and accelerate OSS-based innovation.

Communities

Private institutional support has also played an important role, complementing government support. The OSA¹³⁶ (Open Solution Alliance) recently emerged as a private initiative to support OSS. Created in 2007, its mission is to expand the OSS market through collaborative actions. Among the companies who have joined this initiative are Black Duck, Ingres, Jaspersoft, Unisys, Talend, SourceForge and OpenBravo.

The first initiative was the OSI (Open Source Initiative)¹³⁷, a not-for-profit organisation founded in 1998 with the aim of promoting open code. Currently, one of its best-known activities is maintaining the definition of OSS and certifying licenses complying with this definition, creating a nexus of confidence among developers, users, companies and governments.

Special mention should be made of FOSSBazaar.org, a community in which a Linux Foundation working group facilitates communication between OSS users and experts. This community was founded by the following ICT companies and organisations: Linux Foundation, Coverity, Google, Novell, Olliance Group, OpenLogic, DLA Piper, SourceForge and HP. The community is led by HP, and its objective is the existence of a site dedicated to best practices in OSS management in companies, the development and implementation of processes creating OSS policies in companies, and topics related to the selection, acquisition and implementation of OSS in companies.

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136 <http://www.opensolutionsalliance.org/osa/history.html>

137 <http://www.opensource.org/>



The Free Software Foundation (FSF) is the main organisation supporting the GNU project. The FSF's goals are to preserve, promote and protect the free use, study, copying, modification and redistribution of software, and to defend the rights of OSS users.

4.2.1. Canada



Public Sector

The Canadian Federal Government still has not taken sides with regard to OSS. In spite of several examples of OSS adoption in the public sector, there is no clear policy regarding its use or the promotion of OSS.

The government's first public initiative was carried out by the Public Works and Government Services Commission (PWGSC), which organised the OSS conference in Ottawa in 2002.

That same year, the government commissioned a study¹³⁸ on business opportunities in OSS for the Department of Information and Communication Technologies, belonging to the Ministry of Industry, the objective of which was to promote the competitiveness of ICT suppliers.

In addition, the Infrastructure and Standards Council of the PWGSC assessed the direct and indirect implications of OSS business models in the government's IT investments.

In 2004, the Canadian Treasury Agency published a study¹³⁹ in which it recognised the importance of OSS and recommended a focus for its promotion: ensuring that there are no barriers to acquiring OSS, supporting OSS suppliers by allowing them to register at the Software Acquisition Reference Centre (SARC) and ensuring that Canadian Government workers are acquainted with the different software options.

Among the next steps taken were revising public purchasing practices to ensure that OSS will be evaluated under equal conditions, developing a guide on how to acquire and share OSS in the public sector, developing a strategy with regard to property rights, and facilitating advice on licenses and other legal matters.

Another report issued by the Canadian Treasury Council is the "Free and Open Source Software Overview and Preliminary Guidelines for the Government of Canada."¹⁴⁰

Both the Canadian Government's Ministry of Public Works and Services and the Canadian Treasury Council recognised that OSS is used in the public sector in several federal departments¹⁴¹, an example being the initiative in the city of Toronto, which migrated 450 workstations to OSS in 2003¹⁴². However, only recently do we see examples of clear public commitment to the adoption and support of OSS in the Public Administration. One of these examples is the approval by the City of Vancouver of the "Open Data, Open Standards and Open Source" proposal¹⁴³ in 2009, which supported the adoption of open standards, promoted the reuse of data and positioned OSS on equal terms with proprietary software during contracting procedures¹⁴⁴.

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138 "Open Source Software in Canada: Open Source Business Opportunities for Canada's Information and Communications Technology Sector: A Collaborative

Fact Finding Study," by the e-Cology Corporation, September 2003, http://www.e-cology.ca/canfloss/report/CANfloss_Report.pdf

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139 <http://www.tbs-sct.gc.ca/fap-paf/oss-ll/oss-ll-eng.asp>

140 <http://www.tbs-sct.gc.ca/fap-paf/oss-ll/foss-ll/foss-llotb-eng.asp>

141 "Open Source Software in Canada: Open Source Business Opportunities for Canada's Information and Communications Technology Sector: A Collaborative

Fact Finding Study," by the e-Cology Corporation, September 2003, http://www.e-cology.ca/canfloss/report/CANfloss_Report.pdf

142 <http://www.linuxtoday.com/infrastructure/2003072901826NWDTPB>

143 <http://vancouver.ca/ctyclerk/cclerk/20090519/documents/motionb2.pdf>

144 <http://www.itworldcanada.com/a/Daily-News/0c8fac07-b6bd-44ff-a37c-80f25ac5c44f.html>



Private sector

Canada is a country with potential to develop OSS. Two national industrial associations, the Information Technologies and Communications Association (ITAC) and the Canadian Advanced Technology Alliance (CATA) came out in favour of OSS as a viable option to be considered alongside proprietary software.

OSS use in Canada is in its early stages, as is shown by the fact that the hybrid sales model is the most common, where companies adopt proprietary software solutions that run on OSS platforms.

Business activity developing OSS in Canada is concentrated in large cities like Vancouver, Calgary, Toronto, Ottawa and Montreal. Canadian suppliers are mainly small companies and individual developers¹⁴⁵.

The company ActiveState¹⁴⁶ provides solutions for companies using dynamic languages, and specialises in Perl, Python, PHP, Ruby, etc. ActiveState has partners such as Intel, Sun Microsystems, Oracle, and O'Reilly Media; they claim to work for more than 70% of the Fortune 500 companies.

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¹⁴⁵ "Open Source Software in Canada: Open Source Business Opportunities for Canada's Information and Communications Technology Sector: A Collaborative

Fact Finding Study," by the e-Cology Corporation, September 2003, http://www.e-cology.ca/canfloss/report/CANfloss_Report.pdf

¹⁴⁶ www.activestate.com

Universities

Among the most active sectors is education. There are several examples of OSS development at Canadian universities and migrations in schools. In 2003, the GULUS Linux user group at the University of Sherbrooke launched EduLinux, a distribution for university use.

In British Columbia, several schools migrated to Linux in 2001, and a consortium of schools in Quebec launched the MILLE (Model for OSS infrastructure in education) project in 2003. This school-based project, in collaboration with different public and private research organisations, documents the best practices for OSS educational portals.

Communities

Initiatives exist at both a social and university level, and an Internet search for collaborators in repositories and communities turns up evidence that Canada is present¹⁴⁷.

Numerous OSS user groups and communities in Canada can be named. For example, there are more than 35 Linux user groups in 10 Canadian provinces.

One of the most active Canadian OSS associations is CLUE¹⁴⁸ (Canadian Linux User's Exchange), whose objective is to increase the use and development of Linux, and of OSS in general, providing a meeting place for users, developers and other players in the community, where they can share resources, define standards, etc.

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¹⁴⁷ "Open Source Software in Canada: Open Source Business Opportunities for Canada's Information and Communications Technology Sector: A Collaborative

Fact Finding Study," by the e-Cology Corporation, September 2003, http://www.e-cology.ca/canfloss/report/CANfloss_Report.pdf

¹⁴⁸ <http://cluecan.ca/>



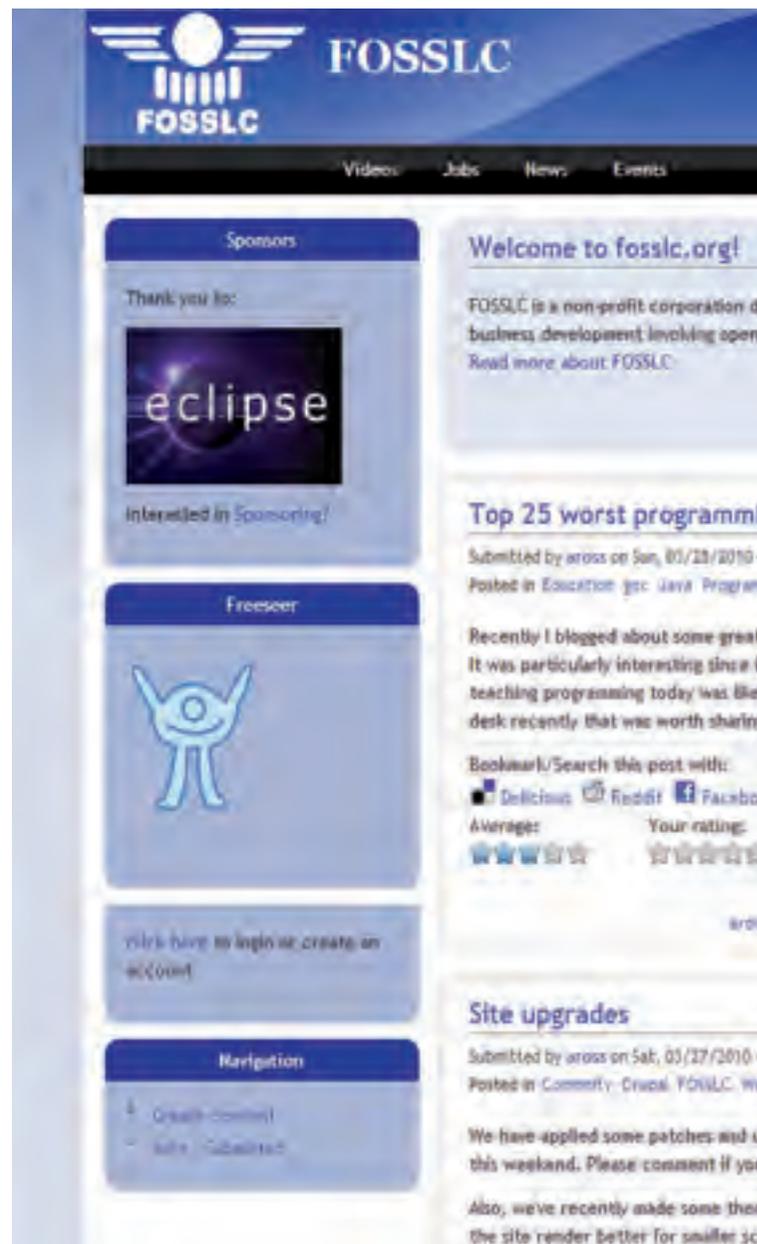
FACIL, the OSS association in Quebec, filed a lawsuit in 2008 against the Quebec State Government, arguing that it was giving preferential treatment to proprietary companies by buying products from these companies instead of using OSS alternatives¹⁴⁹.

The FOSSLC association is a not-for-profit organisation dedicated to OSS development, with the collaboration of both private companies and universities (Alfresco, Eclipse, University of Toronto, etc.). Some of its objectives are to provide and disseminate information about the nature and benefits of OSS, promote open standards and interoperability, and serve as a meeting point for interested communities, foundations and companies.

Other initiatives, such as GOSLING (Getting Open Source Logic Into Governments), formed by citizen volunteers, are intended to informally encourage OSS use in government.



149 <http://www.osor.eu/news/quebec-government-sued-for-ignoring-open-source-alternatives>





4.3. LATIN AMERICA

In Latin America, the development of the IS has come about largely due to the penetration of the mobile phone. The countries that are the heavyweights in terms of the number of mobile phone subscribers in the region are Brazil, Mexico, Argentina, Colombia, Venezuela and Chile.

Currently, the profile of Internet users is changing as the result of a large increase in the penetration of the Internet in the region. According to CEPAL (Economic Commission for Latin America), in overall terms in 2000, users were almost exclusively residents of large cities with a medium to high purchasing power and of working age. There are currently more and more users living in medium-sized cities, and use is even beginning to spread to rural areas, to younger users and little by little to lower socioeconomic classes. This change is due in large part to the fact that the governments of these countries have committed to promoting initiatives that facilitate ICT access for their citizens. In this area, the creation of public access centres and Internet cafés has become especially important. It is estimated that the number of these government and private centres rose to 144,954 in 2006, providing coverage to more than 360 million residents.

A trend has been observed in several Latin American countries (Ecuador, Argentina, Cuba and Paraguay, as well as Venezuela and Brazil) towards adopting OSS, especially with regard to the electronic administration. An example of this trend is the Latin American Electronic Government Charter signed in 2007, which spells out the principle of technological fit, meaning that administrations must select the most appropriate technologies to meet their needs. The use of open standards and OSS is recommended for reasons of security and long-term sustainability. Of all the countries, Brazil has been the leader in OSS implementation, making it one of the most active Latin American countries in terms of OSS use and production.

In 2003, the First Latin American and Caribbean Conference on Open Source Software Development and Use was held. The final declaration of this conference clearly shows the urgent need for different sectors to begin considering OSS as an integral part of building the Information and Knowledge Society, and as a priority when designing policies for development¹⁵⁰. With high rates of illegitimate software use, OSS continues to have a limited future for development.



Brazil has been the leading country in OSS implementation, making it one of the most active Latin American countries in OSS use and production.

Founded in 1990, the Association for Progress in Communication (APC) is a non-governmental organisation and an international network of civil organisations whose goal is for everyone to have access to a free and open Internet. Their service offerings are based on OSS solutions, many of which have been developed by the association itself.

¹⁵⁰ Open source software and the prospects for development in Latin America and the Caribbean http://www.mentores.net/Portals/2/mentores_net_sabemos_software_libre.pdf



In some countries, the user groups have become centres for diffusing and organising events, debates and in-depth studies on the implications of OSS use. Among noteworthy cases is the Linux user group in Uruguay, Uylug, which along with UNESCO has organised regional conferences on OSS to foster discussion on the topic at a national level. The Peruvian OSS Association is also involved in organising training and information events on a regional level, and it actively works with government agencies to take part in defining policies and strategies regarding information and communication technologies. Another interesting experience in Brazil is that of the GNURIAS and LinuxChix groups and the “Software Livre Mulheres” (Women in Open Source Software) Project, involving groups of women OSS users and developers who set their own agenda and engage in projects related to software development, dissemination, education and digital inclusion in collaboration with other groups and the OSS community as a whole¹⁵¹.

Some studies have estimated that of the total number of Linux users around the world, approximately 5% are concentrated in Latin American countries, specifically in Brazil, Mexico, Chile and Argentina¹⁵².

In Chile, OSS is being widely disseminated in schools through the public Internet access network for schools (“Enlaces”), which implements the Edulinux system. In this system, the workstations operate with OpenOffice and the FireFox web browser¹⁵³.

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151 Open source software and the prospects for development in Latin America and the Caribbean http://www.mentores.net/Portals/2/mentores_net_sabemos_software_libre.pdf

152 Open source software and the prospects for development in Latin America and the Caribbean http://www.mentores.net/Portals/2/mentores_net_sabemos_software_libre.pdf

153 http://www.theregister.co.uk/2005/02/10/south_america_open_source/

In Ecuador, the President of the Republic, Rafael Correa, through Decree No. 1014 of 10 April, 2008, established the use of OSS in computers and systems as public policy for agencies within the Central Public Administration. The document also authorises the use of proprietary software only when no OSS solution exists that meets the needs or when the IT project has reached the point of no return.



Peru has also followed the "mandatory" route to introduce OSS within the Administration. Peru's policies emphasise the idea of "open" as a right of all citizens, as a way to provide citizens with access to public information and to obtain high levels of security, for both the state and its citizens. The proposed Law that has been published does not prohibit the production or sale of proprietary software, nor does it require the use of any specific software or come out in favour or against certain suppliers (local or not). It also refrains from limiting software license types, but it does establish that the code must be open¹⁵⁴.

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154 http://www.theregister.co.uk/2005/02/10/south_america_open_source/



In January 2010, according to the Reuters agency in Havana, Cuban companies began to use a variant of an OSS operating system (NOVA) as an alternative to Windows. According to the Official Weekly Workers' Bulletin, several state companies would adopt "Nova," the Cuban adaptation of Linux. According to official data, 80% of Cuban networks and 20% of computers operate using open source architectures and operating systems. Linux is also the operating system used by Cuban Customs, as well as the Ministries of Higher Education and IT.

*In Brazil and Venezuela, OSS use
in the Administration has been
implemented by decree.*

In the private sector, small, medium and large local companies have adopted OSS solutions at different levels, from their use in servers to some experiences with desktop applications. These experiences range from the pharmaceutical industry in Brazil to casino machines in Uruguay and numerous cases of small and medium-sized companies in Chile¹⁵⁵.

155 Open source software and the prospects for development in Latin America and the Caribbean http://www.mentores.net/Portals/2/mentores_net_sabemos_software_libre.pdf

In addition, small and medium-sized companies have emerged that are dedicated to providing OSS solutions through development, adaptation, training and support services.

One of the more emblematic cases in business training is that of Ximian, an OSS company. This project, which resulted in one of the most widely used desktops for Linux, was led in Mexico. Ximian, previously known as Helix Code, was acquired by Novell in 2003¹⁵⁶. Another Mexican project with a significant impact on the OSS sector is GNOME, a desktop environment for GNU/Linux, BSD and Solaris operating systems¹⁵⁷.

A noteworthy case is the Brazilian company Conectiva, which created a distribution of Linux specifically aimed at the Brazilian market, and which was acquired by Mandriva in 2005¹⁵⁸.



156 <http://es.wikipedia.org/wiki/Ximian>

157 <http://es.wikipedia.org/wiki/GNOME>

158 <http://en.wikipedia.org/wiki/Conectiva>



4.3.1. Brazil



Brazil considers Open Source Software as an emblem of the Information Society.

Public Sector

In keeping with the guiding objective for the strategic planning of technology, and specifically information technologies, namely “to democratise and universalise access to information and knowledge through the use of new technologies,” the Government of Brazil has used and promoted OSS as a tool for achieving its aims and as a central part of its planning strategy.

For Brazil, OSS is a key part of its IT strategy, both at a government level and a software industry level. Gaining independence from the large software companies is seen as an enormous opportunity for the development of the local IT industry, considering the enormous human capital the country has and the size of its market, which makes the creation of an ecosystem apt for developing this type of technology feasible.

The Brazilian Government promotes development and use through numerous regulations. In addition, it has created a series of bodies that have assumed leadership roles in the area of OSS and have taken charge of generating and coordinating actions aimed at discussing and disseminating it, especially within the government and state companies, such as SERPRO and EMBRAPA. In turn, there is strong commitment and leadership by public companies in the development and dissemination of OSS, especially through generating successful cases that can be replicated in private environments (such as the case of the Bank of Brazil) and through initiatives that allow the generation of new business opportunities for private companies, such as the INPE¹⁵⁹.

The Presidential Decree of 3 April 2000 created an inter-ministerial working group in Brazil whose objective is to propose policies to achieve universal access to services, a government that is accessible to all, and an advanced infrastructure.

Later, through the Decree of 18 October 2000, an Executive Committee on Electronic Government (ECEG) was established, responsible for formulating policies and coordinating actions to implement the electronic administration in Brazil.

That same year, the ECEG presented the document “Electronic Government Policy,” in which the main objectives were defined as the digital inclusion of all citizens, cost reduction and the improved management and quality of public services, among others.

The ECEG also established the e-PING architecture, “Interoperability Standards for Electronic Government,” which defines a set of policies regarding ICT use in the Administration. e-PING establishes that, whenever possible, open standards shall be adopted and existing OSS solutions shall be given preferential consideration.

159 http://www.serpro.gov.br/noticias-antigas/noticias-2004/20040511_08



In 2003, President Lula da Silva finalised the design of a policy recommending the use of OSS instead of proprietary software in new computers for ministries, state agencies and government companies, making Brazil the leader in OSS implementation in Latin America. The goal of the policy was for at least 80% of computers purchased during 2004 to have OSS systems installed.

The OSS Migration Technical Group (GT-Migra) wrote documentation that formed the basis for implementing migration plans in governmental agencies and organisations (Free Guide¹⁶⁰, Cluster Guide, Migration Plan, Distribution Assessment Methodology, etc.).

The general guidelines for implementing and operating the electronic administration¹⁶¹ indicate that "OSS is a strategic resource for implementing e-Government," "OSS must be understood as a technological option for the Federal Government. Wherever possible, its use must be promoted. Therefore, priority must be given to solutions, programmes and services based on open source software which promote the optimisation of resources and investments in information technologies."

The unnumbered Decree of 29 October 2003 ordered the creation of Technical Committees whose purpose, among others, is "to coordinate and shape the implementation of OSS projects and actions." The Technical Clearinghouse for the Implementation of OSS and that for Digital Inclusion were created.

The Institute of Information Technology (ITI) has been charged with coordinating the government's migration to OSS, running the Open Source Software Brazil Project. One of the first initiatives of the ITI was to establish a relationship between the government and the OSS community. In 2003, members of the Brazilian OSS community were invited to participate with government technicians in the creation of the Technical Committee's

160 <http://www.governoeletronico.gov.br/anexos/versao-em-espanhol-do-guia-livre>

161 <http://www.governoeletronico.gov.br/o-gov.br/principios>

Strategic Plan for OSS Implementation in the Federal Government. Altogether, it includes 18 directives, 12 objectives and 29 priority actions that form the set of guidelines for the migration process¹⁶².

The Brazilian Government's migration strategy began in five ministries; the Ministry of Cities, the Ministry of Culture, the Ministry of Mines and Energy, the Ministry of Communications and the Ministry of Science and Technology. These would serve as experience and as examples for other public entities and companies, such as Radiobras (Brazilian Communications Company), SERPRO (State Company for Federal Government Information), DATAPREV (Social Prevision Data Company) and the Bank of Brazil.

The Bank of Brazil is the largest financial institution in Latin America, which means that it has high licensing costs. It considered carrying out pilot tests with OSS technologies. The migration was carried out in stages. It has migrated to OpenOffice, Linux, FreeMind, G3270, DIA, PDFCreator, Mozilla Firefox, Apache/Tomcat, Moodle, DotProject, CVS/SVN/Trac, PostgreSQL, Eclipse, etc.

Currently, the migration process is included in the CISL 2009 Planning from the Strategic Committee on Open Source Software in the Federal Government¹⁶³.

Regulation 4/2008 published by the SLTI/MP deals with Administration's IT services contracting process. The process must identify different solutions, taking into consideration the availability of solutions in other Administrations, those existing on the Brazilian Public Software Portal, market alternatives, the existence of OSS, etc.

162 http://www.softwarelivre.gov.br/planejamento-antiores/copy_of_index_html/

163 <http://www.softwarelivre.gov.br/planejamento-cisl-2009>



In 2007, the Brazilian Public Software Portal was created¹⁶⁴ to generate collaboration between users and developers, and it is currently the leading space for sharing OSS technological solutions. In addition to increasing the number of users, this portal has generated significant commercial activity, with a growing number of service providers.

In the educational sector, Brazil has also implemented various initiatives to promote and use OSS. The Centre for the Dissemination of Technology and Knowledge (CDTK) promotes the use of OSS through training courses. This initiative is backed by the ITI, and has the support of the Ministry of Culture, the University of Brasilia (UnB) and the IBM company.

The objective of the National Programme for Educational Technology (ProInfo) is to promote the pedagogical use of IT. The computers that form part of the programme have a distribution called Linux Educational 3.0, which is based on Kubuntu 8.04. The programme has now taken its first steps and at the end of last year it already had no less than 29,000 laboratories installed, which enables it to serve no less than 36 million students.

Launched in 2003, the “Computers for Everyone” programme intends to facilitate access by the citizens to a quality PC with a GNU/Linux operating system and OSS applications. Another programme, “Computers for Inclusion” provides recycled computers to support the dissemination of community telecentres and the computerisation of public schools and libraries. The computers are equipped with office packages and a GNU/Linux operating system.

Private sector

Development companies in Brazil are funded through domestic capital (98%) and are small in size, in terms of both turnover and the number of employees: 79% have an annual turnover of up to €200m (only 11% have an annual turnover of over €1m) and 70% have a maximum of 9 employees¹⁶⁵.

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164 http://www.softwarepublico.gov.br/O_que_e_o_SPB

165 Impact of Free and Open Source Software on the Software Industry in Brazil http://observatorio.cenatic.es/index.php?option=com_rubberdoc&view=doc&id=11&format=raw

According to a study¹⁶⁶ published in 2008 by the Institute Without Borders, the current situation in Brazil is one in which 73% of large companies (with more than one thousand employees) use OSS. Most use it for both web servers and critical mission application servers. With regard to small companies, the percentage of OSS penetration is 31%.

Petrobrás, the largest Brazilian company and the company with the greatest productivity worldwide in deep water petroleum exploration, replaced its €8,000,000 supercomputer with a Linux-based cluster that processes more information at a greater speed than the supercomputer.

Universities

Univates is a Brazilian state university working exclusively on free technological platforms. In 1999, the university centre UNIVATES, in southern Brazil, decided to develop its own academic administration system, called SAGU, using OSS tools. Due to the success of the product, the IT team at UNIVATES has developed other successful OSS-based applications. UNIVATES offered the IT team the opportunity to become a separate entity from the university.

SOLIS currently develops OSS-based solutions for local industries and universities in Brazil. It charges for its services, and provides all its products under a GPL license. Its objective is to support local companies and make them more competitive, as well as to create new jobs for people in the sector.

Communities

The significant OSS activity in Brazil is naturally supported by heavy activity in the country's OSS communities. Debian and Ubuntu are the two most active communities, with local teams focusing their efforts on translation into Portuguese. The GNU/Linux community also has several user groups in Brazil, such as the Brazil GNU/Linux user group and the Paraná Open Source Software Movement.

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166 <http://ciberprensa.com/brasil-adopta-el-software-open-source/>



4.3.2. Argentina



Public Sector

In Argentina, the central government promotes policies that do not favour either OSS or proprietary software. It establishes that proprietary software will be used until the current contracts end, at which point new contracts will be negotiated, either with proprietary software suppliers or OSS suppliers, based on the criteria of quality versus price¹⁶⁷.

The ASLE (Open Source Software Environment in the State) institution is in charge of tracking and collecting information on the different OSS experiences in the public sector around the world. The Argentine Government is keeping its options open, without leaning towards one type of software or another, while awaiting successful experiences that support the advisability of OSS use¹⁶⁸.

The two government agencies that coordinate IT policies and their implementation, the National Information Technologies Office (ONTI) and the National Information Office, announced in 2004 that they would promote Linux in all Administration applications in order to reduce costs, create employment and improve security¹⁶⁹.

Before 2008, when a law was proposed to make OSS use obligatory in the Administration¹⁷⁰, several provinces had already enacted various initiatives to promote the development and use of OSS.

In 2004, the Lower House of the Buenos Aires province approved a resolution to migrate to OSS on all computers forming part of the organisation's computer network¹⁷¹.

That same year, the Paraná City Council decided to migrate to OSS as a result of various problems with its proprietary software licenses¹⁷².

By means of Decree 1800/07 from the Executive Provincial Government, the Provincial Government of Misiones approved the Institutional Plan for Adopting Open Standards for Office Files in the scope of the Public Administration in the Province of Misiones¹⁷³, which establishes that “any electronic office document created and issued by the organisations falling within the scope of application of this Decree must be encoded in a file format that meets the specifications established by standards ISO 26300 (ODF) and ISO 19005 (PDF/A).”

The City of Rosario is carrying out the transition to OSS use at the desktop level, which it has called Project Munix. The project began in 2004, and its success is ensured, thanks to the legal framework¹⁷⁴ established for this purpose.

170 http://news.cnet.com/8301-13505_3-9918082-16.html

171 http://www.agencianova.com/nota.asp?n=2004_11_10&id=18665&id_tiponota=11

172 <http://www.softwarelibre.cl/drupal/?q=node/485> and <http://www.hcdparana.gov.ar/pdf/Proyecto2006.pdf>

173 http://www.misiones.gov.ar/egov/index.php?option=com_docman&task=doc_download&gid=7&Itemid=27

174 Ordenance No. 7787/2004 <http://www.rosario.gov.ar/normativa/ver/visualExterna.do?accion=verNormativa&idNormativa=34024> and Decree No. 2833/2005

<http://www.rosario.gov.ar/normativa/ver/visualExterna.do?accion=verNormativa&idNormativa=37700>

167 <http://www.uta.fi/hyper/julkaisut/b/mannila-2005.pdf>

168 <http://www.uta.fi/hyper/julkaisut/b/mannila-2005.pdf>

169 Marko Mannila, “Free and Open Source Software: Approaches in Brazil and Argentina,” June 2004, page 25.

<http://www.globaledvelopment.org/papers/FOSSTAMPEREMANNILA.doc>



Private sector

According to the 2004 survey conducted by Argentina-based Trends Consulting¹⁷⁵, 42% of Argentine companies use Linux and many of them plan to implement OSS in new applications.

Many SMEs have been created that offer OSS products. The website for the White Paper on open source software¹⁷⁶ lists Argentine companies that provide OSS services.

In 2008, the Argentine Chamber of Open Source Software Companies (CadESoL) was founded. CadESoL currently consists of eleven OSS suppliers. Its activities focus on promoting the development of businesses with OSS through collective actions: projects, research, promotion and development.

Universities

For several years now, the National University of La Plata has been carrying out projects contributing to the adoption and dissemination of OSS in Argentina. Its initiatives include distributing GNU/Linux Lihuen and applying it in educational institutions at the primary, secondary and university level. For the past 10 years, the university has been successively incorporating OSS in collaboration with companies in order to obtain hardware compatible with Linux. Similarly, the university promotes social projects that enable students to carry out OSS-related IT development tasks for welfare, educational and third sector organisations that lack the funds for this.

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175 http://www.theregister.co.uk/2005/02/10/south_america_open_source/

176 <http://libroblanco.org.ar/>

Entre Ríos National University and La Plata National University collaborate in the initiative coordinated by the Telefónica Chair at the University of Extremadura as part of the LULA project: Linux for Latin American Universities, the objective of which is to create a Linux distribution that compiles educational OSS applications used in Latin American universities.

One example of business-university collaboration is the DOGO project, carried out by the Openware company in collaboration with Rosario University, for the development of open code-based security software that would permit replacing current tools that require powerful hardware by simplifying the network protection system.

Communities

Many OSS activists have organised themselves to promote OSS from a technical as well as a social perspective. SOLAR (Association of Open Source Software Users and Developers of Argentina), a public association whose activities are primarily based in Buenos Aires, and ASLE, both played an important role in developing Ututo.

Among the user groups and associations that support OSS use is CaFeLug¹⁷⁷. The Federal Capital Open Source Software user group is one of the largest groups in the country in terms of member numbers, and is the driving force behind several initiatives that are already considered regular gatherings in the community.

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177 Voces libres de los campos digitales [Free voices from the digital fields] <http://www.sulabatsu.com/voces/Documentos/voces.pdf>



LugRo is the GNU/Linux user group in Rosario. It is another historical group in the local community. It operates in coordination with the Association of New Technologies (ANT), which was established as an NGO to manage OSS-related activities in the city of Rosario.



LugLi¹⁷⁸ is the Open Source Software user group in Litoral. Most of its members are from the provinces of Santa Fe and Entre Ríos, and they communicate by means of a mailing list to question and comment on matters related to the field of GNU/Linux. They have made substantial contributions to the LuCAS project in terms of free documentation in Spanish. Several members of this group also take part in projects like Gleducar or organisations such as the Free Way Foundation.

In turn, the USLA, Argentine Users of Open Source Software, serves as a platform to provide support to groups across the country that need it. USLA is the successor to LugAr, one of the first user groups established in Argentina in the 1990s.

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178 <http://www.lugli.org.ar/mediawiki/index.php/Portada>

4.3.3. Mexico



Public Sector

In order to speed up development in the IT sector, the Secretary of the Economy presented the Programme for the Development of the Software Industry (PROSOFT) in 2002, with a 10-year plan (2003-2013)¹⁷⁹. Its most important objective is to create the elements necessary to foster a robust software industry in Mexico by means of regulation and providing funds. Since its creation, it has maintained a continuous and equitable dialogue with all those involved in the Mexican software industry, including AMESOL (the Mexican Open Source Software Business Association), a public NGO representing the business community in the OSS industry.

AMESOL is an active promoter of open standards and free competition among all players. Nowadays, it covers the entire Mexican software industry and has established clear, long-term growth-orientated objectives.

Significant OSS penetration can be found in the Public Administration, both at a state and local level. The Government of Mexico City has developed its own GNU/Linux distribution. This project, carried out by the Subdirectorate of Information Systems for the Tlalpan District, concerns a customised distribution for the government.¹⁸⁰

According to a recent study published in 2009, “The Perception of Open Source Software Use in the Public Sector in Mexico,” which included a survey of nearly 350 civil servants, 74% stated that they were aware

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179 In 2013, annual software production is expected to reach \$5 billion USD (\$15 billion USD in annual sales, when adding in IT-related services) and it is recognised as the leading Latin American country in terms of software development and digital contents in Spanish.

180 <http://www.somoslibres.org/modules.php?name=News&file=article&sid=1217>



of OSS and 66% used it¹⁸¹. Among the difficulties that they faced when implementing OSS, those interviewed mentioned some related to the lack of knowledge or experience, poorly documented OSS tools and applications and difficulties related to integration with proprietary software.

The Presidency of the Republic Internet System (SIP) is the entity in charge of disseminating all topics related to the Presidency of the Republic through electronic means, and it uses technology solutions based on OSS¹⁸². The SIP is a strong promoter of OSS at all levels of government. It was precisely an initiative by SIP that was responsible for the creation of the portal softwarelibre.gob.mx, which has been dedicated to providing information and guidance on OSS-related topics in government since 2005.

The two largest state companies in Mexico are linked to the energy industry, and both state companies use OSS extensively. The PEMEX subsidiary dedicated to exploration uses large Linux-based clusters for seismic analysis. Meanwhile, the Federal Electricity Commission (CFE) uses OSS on a daily basis in many of its activities.

Other institutions, such as the National Defence Ministry, the Senate, the Ministry of the Environment and Natural Resources (Semarnat) and the CFE already use different OSS programs¹⁸³.

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181 Percepción del uso Software Libre en el Sector Público de México. [Perception of Open Source Software Use in the Mexican Public Sector.] <http://www.politicadigital.com.mx/pics/pages/analisismodelos_base/Estudio_Software_Libre_en_el_Sector_Publico.pdf>

182 <http://www.software.net.mx/desarrolladores/minegocio/noticias/codigoabierto/softwarelibre.htm>

183 <http://softwarelibre.fox.presidencia.gob.mx/?q=node/384>

Private sector

According to Gilberto Romero¹⁸⁴, a business systems analyst for the Select company, Linux has primarily been used as a platform for Intel X86 servers and server applications. In the area of Internet portal servers, the average adoption rate is between 12 and 15% per year. OSS is penetrating in companies with between 250 and 1,000 employees, who want to reduce their platform adoption costs and need servers or systems that provide greater stability for their equipment.

The consultancy firm IDC reports that 60% of the companies in Mexico and Latin America are in the stage of evaluating, implementing or adding to the Linux operating system for servers, which represents 40% in terms of workstations. In 2006, Linux use grew by 7.6% in Mexico, making it the second largest Latin American market after Brazil.

According to information published by Select, in Mexico, 72% of servers that are operating with Linux use versions downloaded from the Internet by company staff, without contacting any other company to carry out the implementation. Select indicates that in 2009, at least 39% of all Mexican companies, including SMEs, will use OSS.

Universities

One example of OSS implementation in universities is that of the Polytechnic University of Pachuca: 95% of the servers operate using the CentOS operating system, and the other 5% use Debian¹⁸⁵.

Mexican universities also contribute to disseminating OSS through programming courses, such as those offered by the University of Cuautitlán Izcalli and the Autonomous University of Chiapas.

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184 http://www.amesol.org.mx/index.php?option=com_content&view=article&id=165:mitos-y-verdades-del-software-libre&catid=77:noticias-de-la-industria&Itemid=100

185 <http://softwarelibre.fox.presidencia.gob.mx/?q=node/388>



Communities

Among the Mexican communities, Debian, Ubuntu and Gnome are the most active. The Mexican Mozilla community has worked on developing add-ons to adapt the Firefox web browser to Mexican Spanish. Among other communities that help promote OSS in the country are Unixm xico and the Open Source Software Community of Mexico City.

5.3.4. Venezuela



Public Sector

In Venezuela, OSS was first introduced to the country in 2004 with the publication of the "Libro Amarillo del Software Libre: Uso y Desarrollo del SFA en la Administraci n" [Yellow Book of Open Source Software: the Use and Development of OSS in the Administration], which includes a compendium of presentations and work undertaken, as well as the result of panel discussions on topics related to OSS adoption in the Administration.

Venezuela, along with Brazil, is one of the Latin American countries whose government has made a firm commitment to OSS.

That same year, the government published Decree 3390 on OSS use in the Administration, which contained the mandate for the Administration to migrate to OSS within a period of two years. This was the starting point for the execution, over several years, of a series of migration plans in the Administration and a series of initiatives were carried out supporting OSS, such as the registry of Institutional Plans for Migration to Open Source Software in the Public Administration, the creation of the Open Source Software Academy and the software factory,¹⁸⁶ among others.

In July 2005, the Open Source Software Migration Plan was approved, which established that the Federal Public Administration must give priority to the use of OSS developed with open standards on its platforms. The Guide for the Federal Public Administration's Open Source Software Migration Plan was also published. The plan addresses four areas: migration and standards, OSS awareness, training and fortifying the software industry.

The INVESOL (Venezuelan Open Source Software Industry) portal is an initiative by the CNTI (National Information Technologies Centre) that brings together different players in OSS on the one hand, and the state's demand in this area on the other. This tool is intended to promote the exchange of OSS solutions and services.

The CANAIMA project is another initiative by the CNTI, in collaboration with the Venezuela Open Source Software community, the Debian community and other foundations. Various totally OSS-based tools have been developed within the framework of this project, originally in response to the office needs of end users in the Public Administration, but also to the rest of the users by extension.

Private sector

The promotion of the adoption of OSS by the Venezuelan administration has led to the emergence of an associated private sector providing technical support to public entities during migration.

186 <http://sistemas.fsl.fundacite-merida.gob.ve/>



No data is available regarding the degree of OSS adoption in the private sector, but OSS penetration in this sector will undoubtedly grow with OSS adoption by the Public Administration.

Universities

In the context of national OSS promotion, it is no surprise to see the large number and great diversity of OSS projects carried out in Venezuelan universities with primarily state funding. One example is the project at the Central Venezuelan University, financed by the Organic Law for Science, Technology and Innovation (LOCTI): "Parallel Computing Methods for Process Optimisation and Simulation in the Energy Sectors."

Communities

The aim of the Open Source Software Association of Venezuela (SOLVE) is to provide a stable platform for participation and information exchange in all OSS-related areas. It is formed by students, professors, civil servants, members of NGOs, organised communities, representatives from private companies and individuals. The goal of the Linux community in Venezuela is to share information and experiences with regard to OSS and Linux. In particular, it aims to support their dissemination and use.

4.4. ASIA

This region is characterised by disparities between the status of OSS in the advanced countries (Japan and South Korea) and in the emerging countries (China, India and others). Developing countries in Asia have experienced significant growth in ICTs over the last few years, increasing their consumption of certain ICT-related goods and services in the most important urban areas.



India holds first place in software and IT service exports worldwide, an industry that will represent 11% of the country's GDP in 2010.



The incipient incorporation of the developing countries into the IS has not only stimulated growth in the region, it has also made it one of the main sources of ICT goods and services for the rest of the world's markets. The hardware and telecommunications equipment markets reach their highest figures in the Asian-Pacific region. Examples are China, as the main source of hardware, and India, as one of the leading sources of software production. The revenue of other countries, such as Malaysia and Vietnam, for ICT product exports is also increasing. This trend is expected to continue and to accelerate over the next decade.

This economic growth, not only in the area of ICTs, but also in other sectors of production, is leading to the economic development of societies in the region, and the advancement of the IS along with it.

If we consider the largest Asian countries, their current work to advance the use of their respective languages, together with the still low levels of Internet penetration found in most countries in the region, means that there is enormous future potential for these languages on the Internet. This is the case for Chinese, with the population of China being more than 1.3 billion, of whom only 184 million are Internet users. These figures demonstrate the importance the country will have over the next few years.

The countries with the highest incomes in the area were the first to define and adopt policies with regard to ICTs, followed by the rest of the countries in the region, who came to identify the ICT industry as key to the economic development of the region.

In Asia, the correlation between the IS and OSS indices is not as strong as it is in regions with more developed economies. This may be due to the fact that these are low-income countries whose economies make money by producing Information Technology and Communications products, but whose citizens lack the financial capacity to consume them en masse, with the exception of Japan and South Korea.

The level of OSS development in the region is not very homogenous, and it is led by the countries that we have already mentioned as the leaders in software and hardware production, namely India and China.

Different agreements in the region have fostered the advancement of OSS. One such agreement is the CJK, between China, Japan and Korea, to adapt OSS to local languages. Another noteworthy example is the recently-created AOSSC (Asian OSS Centre) alliance, signed by 10 Asian countries/regions: China, Hong Kong, India, Indonesia, Japan, Macau, Malaysia, the Philippines, Singapore and Thailand. The aim of this alliance is to promote OSS adoption and development in Asia.



Most of the activities carried out by OSS communities in this region are aimed at the local adaptation of OSS, made necessary by the need to cater to the variety of languages in the region. The lack of English proficiency in the region (except in India) is an important factor that limits the contribution made by these countries to the global OSS community. At the same time, these initiatives for local OSS adaptation by the



community have an incalculable value, as they significantly contribute to bringing the IS to local populations, especially in the case of languages with alphabets using non-Latin characters.

The International OSS Network (IOSN) is an OSS Centre of Excellence in the Asian-Pacific region that believes that developing countries can improve their economic and social conditions by using accessible software, such as solutions provided by OSS.

The role of governments in OSS adoption and promotion varies from resolute interventionism in the case of China, where the only local OSS distributor is a state company, to India's more liberal approach, with opinion divided between the advantages that OSS promotion has for its economy, and its dependence on the foreign multinational software corporations established in the country, for whom the important Indian software sector works (the so-called software factories). Intermediate positions have been adopted by the governments of Japan and South Korea, both of which have clear policies promoting OSS. In Japan the aim is to reduce their dependence on multinational software companies, while in South Korea it is to promote the national ICT sector and thereby boost the economy.

In all countries within the region, universities make an important contribution to regional OSS development, participating in collaborative projects with major OSS companies such as Sun Microsystems, Red Hat and IBM, but particularly by training qualified OSS professionals. Clear examples are the Linux Hub Centre at Seoul University, in collaboration with IBM, or the Institute for Open Technologies and Applications (IOTA), a joint-venture between the state of West Bengal, Jadavpur University (India), Sun Microsystems and Red Hat.

OSS penetration in the private sector is still not very high, but OSS has already achieved an important position in South Korea, and to a lesser degree in Japan, and it is expected to make great strides in China over the medium-term.



In Korea, OSS implementation has been carried out primarily through the Haansoft corporation, and OSS penetration is already quite significant in the banking and hospitality sectors. The lack of support has slowed down greater OSS penetration in the Japanese private sector, but some OSS companies are consolidating their positions in the country, which will help to make its use more widespread.

OSS is quickly becoming an essential part of the IT infrastructure in Asia. According to Gartner, a firm of analysts, approximately 60% of state agencies in Asia will be using OSS in their critical missions by 2010.



4.4.1. India



Public Sector

The government promotes OSS use through different initiatives, such as the National Resource Centre for OSS (NRCFoss), whose activities focus on training, repository creation and maintenance, local adaptation, policy formulation and the promotion of OSS-related business initiatives¹⁸⁷.

The Linux India Initiative was launched by the government with the primary objectives being to develop OSS resource centres and pilot projects, support OSS local adaptation and carry out research studies.

Today, Bangalore Valley is as competitive as the American Silicon Valley in terms of providing a technology development cluster.

¹⁸⁷ See http://www.nrcfoss.org.in/index.php?option=com_content&task=view&id=41&Itemid=86

There is no unanimous opinion about the effort made by the government to promote OSS.

One opinion¹⁸⁸ is that the government does not provide enough official support to OSS use and development in the country. The reason for this is that it does not want to enter into conflict with interests in the technology sector: the relatively neutral policies of the Indian Government with regard to OSS are motivated by the desire to keep American companies in the country¹⁸⁹, since the technology industry is vital to the Indian economy¹⁹⁰.

Some opinions to the contrary believe that the Indian Government, recognising the advantages OSS provides in a country like India, is proactively promoting its development¹⁹¹.

Private sector

India has been involved in OSS for many years, due to the inability of Indian companies to invest in proprietary technologies. OSS was seen as a way of avoiding licensing costs. The first to adopt OSS were Indian technology companies, those providing software development services to foreign companies, that had the internal technical resources to support OSS environments.

Later, government agencies were the next to adopt OSS in workstations, in order to avoid paying licensing charges. Various government departments have adopted and are using OSS at both a national and

¹⁸⁸ Madanmohan Rao states that the government's attitude toward OSS has been strongly influenced by the Microsoft lobby.

¹⁸⁹ Andrea DiMaio, analyst at Gartner.

¹⁹⁰ The top 20 Indian IT service companies generated altogether \$5.77 billion in exports in 2004, according to CNET Networks Inc. http://news.cnet.com/India-Speaking-your-language/2100-7344_3-5951942.html?tag=mncol;txt

¹⁹¹ According to François Bancelhon, the CEO of Mandriva, "The Indian Government has a strong will to promote open source due to the potential to save costs and gain independence. India has a (sic) strong software expertise and wants to have the ability to control its own technology by being a partner, rather than a customer."



state level, although the large-scale implementations have been carried out at a national level.¹⁹² Recently, this trend has slowly extended towards end users in companies, due to the maturity of OSS, and this has been strengthened by the presence of important open source software companies in the country.

Nonetheless, OSS penetration over the short-term will be concentrated mainly in server environments, where it is forecast to reach a market share of 20.8% in 2011¹⁹³. The lack of strong support for OSS applications leads us to believe that it will not achieve high development growth rates, even though the greater presence and support from OSS companies will increase its penetration. Some examples of OSS applications available are those used for meteorological forecasts, surveillance and petroleum exploration.

In reality, India is one of the leading countries in the region, with enormous potential and where companies such as Oracle, IBM, Red Hat, Microsoft, Mandriva, Infosys, InfoAxon Technologies Ltd., etc. are fighting for a place in the sector.

Universities

India has a considerable base of human resources with technical know-how and a growing interest in OSS¹⁹⁴. In fact, the educational system in technical fields is built around the Unix concepts. Most IT courses base their training on Linux, and as a result, there is a large number of engineers with this knowledge¹⁹⁵.

192 Madanmohan Rao, Research Director at the Asian Media Information and Communication Centre, in statements made to CNET Networks Inc. 14 November 2005.

193 Gartner report "Open Source in India, 2008." www.gartner.com

194 IONS-UNDP International Open Source Network country profiles. <<http://www.iosn.net/south-asia/countries/india/wiki/>>

195 Approach Document for The Linux India Initiative by The Government of India.

http://atulchitnis.net/writings/oss_govt.pdf



Intense activity in the private software sector in the country has generated the need for qualified manpower, trained in information technologies. Indian universities have trained these qualified human resources for the country. Its universities and technology institutes have renowned international prestige for their high academic level in mathematics and scientific courses.

Recently, large international projects from multinational software companies have been increasingly including open source technologies, which is creating a demand for qualified employees. Indian universities have responded by providing training and participating in OSS projects, often in coordination with multinational software companies.

A clear example of this is the Sun India University Program, which achieves active participation on the part of hundreds of university students in projects like OpenSolaris, NetBeans, Project GlassFish, OpenPortal and Apache.

Academic and R&D&I sectors are also beginning to use popular OSS tools in areas such as digital signal processing, design and drawing, SIG, library management, academic course management, etc.



Financed by the Indian Government, the NRCFOSS project was launched in April 2005, with the mission to promote OSS in the country. This project is being carried out jointly by a government R&D&I agency called C-DAC (Centre for Advanced Computing) and the AU-KBC Research Centre at Anna University in Chennai.

Communities

There is a network of more than eighty user groups, although not all are of the same size or equally active. The largest groups are located in cities such as Bangalore, Delhi, Mumbai, Kolkata, Chennai and Hyderabad, although smaller user groups have also been created in smaller cities. Several national networks are also in operation, such as the Linux India Network or the Free Software Foundation-India.

Active communities in India include: BOSSGNU/Linux, Debian, Ubuntu, IndLinux, focused on local adaptation projects; Anjuta, dedicated to the IDE project; OpenOffice, producing local adaptations and improving functionalities; and Fedora, centred on local adaptation activities.

Generally speaking, the projects carried out by OSS communities concern initiatives related to programming language projects in local languages, as well as local adaptation¹⁹⁶, educational and development projects.

At a non-governmental level, the Indian not-for-profit organisation, Twincling, develops and promotes the use of OSS. In addition, the National Resource Centre project created by the Indian Government's Department of Information Technologies has an unofficial website maintained by Anna University to facilitate activities associated with the project, and is one of the academic centres promoting OSS training in India.

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196 "Localizing free software for a free country" is the slogan of IndLinux, some of the largest and most popular groups that have been extremely successful in their local adaptation work.

It would seem that India, a country with low incomes, where a majority of the population cannot afford to buy a computer, which would cost more than their annual salary¹⁹⁷, where there are the skills and knowledge necessary to modify source code, and where there is an unmet demand for local adaptation by proprietary software suppliers, has the appropriate characteristics for the population, companies and the government to advocate OSS use.

4.4.2. China



In China, the OSS movement is controlled by the government, not by the market.

Public Sector

OSS growth in China is based on the expansion of Development Communities and use by the Administration. In China, OSS not only receives important backing and promotion by the government, OSS development is also planned and orchestrated at a governmental level. OSS development and implementation is not dictated by the market, rather by the government.

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197 The per capita income in India is \$474 USD, while the cost of a PC is \$227 USD and software, \$250 USD, according to information provided by Javed Tapia in an interview at Red Hat. <<http://www.redhat.com/magazine/015jan06/features/tapia/>>



The reasons why the Chinese Government seems interested in implementing OSS in the country are not merely economic. The boost generated in the local software industry, cultural and political reasons¹⁹⁸, and specifically scepticism regarding proprietary software, are determining factors behind the firm support for OSS given by the Chinese Government.

Regulation by the Chinese Government requires all new computers to be sold with preinstalled OSS and encourages the purchase of software made in China to reduce dependence on intellectual property from foreign countries. Massive projects have also been carried out for the electronic administration. The Chinese Government promotes several software standards at a state level. These standards give national suppliers an opportunity to compete on equal terms in their market with international suppliers.

The main Linux supplier in China is Red Flag Linux. Founded in 1999, its second largest shareholder is the government. Red Flag Linux is the company behind the Asianux project, along with Miracle Linux in Japan and Haansoft in Korea, whose aim is to develop a standardised Linux for use in Asia. The version Asianux 2.0 is currently on the market.

Red Flag Linux has been responsible for implementing OSS in government, at local, provincial and national levels. Linux is used, for example, by the National Ministry of Science, the Ministry of Statistics, the Chinese Postal Service, the General Customs Office, the Chinese Academy of Science, the State Tobacco Monopoly Administration (STMA) and the Digital Library project at universities. In fact, the government announced that all government agencies must use only local software by the year 2010¹⁹⁹.

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198 News article published at CNET Networks Inc. Publication date: 14/11/2005. http://news.cnet.com/China-Local-software-for-local-people/2100-7344_3-5951629.html

199 Gartner China Attempts to Block Foreign Software in Government.

Private sector

In spite of the fact that much has been made of the OSS phenomenon in China²⁰⁰, in reality it is still very young. In the Chinese software market, OSS penetration is greater in the operating system and database management segments than in the applications segment. OSS in China means Linux. With a 30% market share²⁰¹, it is estimated that Linux achieved a revenue of €14m in 2007.



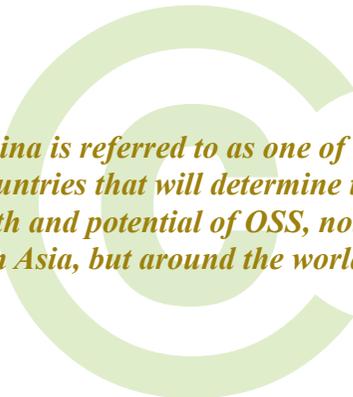
China continues to be a good breeding ground for the adoption of OSS technologies. Given that it is a developing country, it has practically no constraints in terms of legacy systems, and it can adapt to new technologies such as OSS. Lower ownership costs, the availability of the necessary applications and open standards and development processes are the main catalysts behind the growth of OSS in China.

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200 An Internet search for "open source in China" on 4 September 2009 produced 88.8 million results; "open source in India," 57.9 million results, "open source in United States," 78.7 million results; "open source in Europe," 44.3 million results.

201 Including that installed on servers, embedded software and installed in mobile phones. Presentation by Apache's J. Aaron Farr in 2007. http://cubiclemuses.com/files/open_source_in_china.pdf



The desire to reduce costs and improve security may convince some companies to use OSS technologies. However, support and complexity problems associated with OSS environments due to the lack of Chinese characters are the main factors inhibiting its adoption. Nonetheless, it should be stressed that greater awareness concerning legal software use would enable greater OSS development.



China is referred to as one of the countries that will determine the growth and potential of OSS, not only in Asia, but around the world.

Universities

Another fundamental pillar in the development and implementation of OSS in China has been its educational system. Chinese universities have opted for OSS for cost-related reasons, but also in order to employ the large number of graduates with vast knowledge in software and application development.

In 2005, The Zhengjiand Linux Centre (ZJLC) formed an alliance with nearly 70 Chinese universities called the Leadership of Open-Source University Promotion Alliance (LUPA). LUPA founded Lupaworld, a community where members exchange ideas and share OSS-related knowledge. The LUPA Foundation has resulted in more than 300 universities and schools offering core courses in open code technologies. 1500 professionals have obtained Linux operator or administrator certification.

The LUPA Foundation offers nine certifications, including qualifications for software engineers. During the last month alone, it published 11 Linux textbooks in response to government demands to learn advanced technologies.

A similar initiative, also in 2005, was the Guangdong Linux Centre, which along with 27 universities created the Guangdong Leadership of Open-Source University Promotion Alliance (GDLUPA). GDLUPA is very involved in training university students as Linux programmers.

One of the main projects in which various universities are currently involved is the local adaptation of many OSS programs from non-Chinese speaking countries, such as Sakai. The expected trend is for Chinese universities to collaborate with other universities worldwide to jointly develop specific OSS for their sector.

China is considered to be one of the countries that will determine the growth and potential of OSS²⁰², not only in Asia, but around the world²⁰³.

Communities

OSS communities in the country still seem rather young²⁰⁴. The OSS development model in China may be different to that in other countries. However, their lack of visibility may be due to language barriers. Another reason given is that communication within the Chinese OSS community may be different²⁰⁵. It is interesting to note that in user groups such as the Beijing Linux User Group (BLUG), over 50% of the members are foreigners and the website is in English.

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202 100,000 programmers graduate every year, the domestic software market in 2005 was \$5.8 billion (17% higher than in 2004), there are 160 million Internet users (8% of the population) and a Java developer costs \$10 USD/hour. Presentation by Apache's J. Aaron Farr in 2007. http://cubiclemuses.com/files/open_source_in_china.pdf

203 Presentation by Apache's J. Aaron Farr in 2007 http://cubiclemuses.com/files/open_source_in_china.pdf

204 "China's open source communities are relatively small and don't have much influence. There is a lack of big projects, few players, and little money," (Hu Ke, CCID Analyst). Presentation by Apache's J. Aaron Farr in 2007. http://cubiclemuses.com/files/open_source_in_china.pdf

205 IONS-UNDP International Open Source Network country profiles <<http://www.ions.net/south-asia/countries/china/wiki/>>



The initiatives and alliances in the field of OSS in China are very varied, both at a national and a regional level, and representatives from large ICT companies often participate in them.

The COPU (China OSS Promotion Union) describes itself on its website as a voluntary, non-governmental social alliance between companies, communities, universities, research organisations, clients, industrial organisations and promotional and support agencies, with governmental guidance. Created in 2004, its structure was later adjusted to include a Think Tank that meets annually to reflect and provide advice to the COPU. The experts include directors and founders of the main entities in the sector²⁰⁶. COPU's primary objectives are to promote Linux/OSS development in China and to foster communication and cooperation in OSS between China, Japan and Korea. In this sense, the CJK constitutes a collaborative agreement between China, Japan and Korea. This group works to develop and market a unified Linux platform for all of Asia, and also concerns itself with OSS education and training.

4.4.3. South Korea



Public Sector

As early as in 2002, the government announced a migration project²⁰⁷ for 120,000 of its workstations (23% of all computers) from Microsoft to the Korean Hancom Linux distribution²⁰⁸, Linux Deluxe, in its ministries, government agencies and universities. At that time, many government agency and bank portals were using only proprietary systems²⁰⁹.

206 Linux, Apache, MySQL, Ubuntu, FSF, IBM, SourceForge, Intel, JBoss, Mozilla, Red Hat, Novel, SUN, Oracle, etc.

207 http://www.theregister.co.uk/2002/01/14/korea_migrates_120k_civil_servants/

208 Hancom is a company belonging to the Haansoft Group.

209 <http://news.zdnet.co.uk/software/0,1000000121,39116799,00.htm>

Once again in 2004, it announced the start of 1,000 Linux migration projects²¹⁰ in local governments as part of a general migration plan. In 2006, it announced a plan to begin several Linux migration pilot programmes in different cities to set an example for the rest of the country²¹¹.

According to some publications, Korea's continuing plans for migration to Linux correspond to the long-term lack of support and compatibility from Microsoft. For example, Microsoft decided to stop providing update patches for the Windows 98 antivirus program, leaving many Koreans without updates. Sector data indicates that nearly 13% of all PCs in Korea use Windows 98, most of which belong to government agencies²¹². By opting for OSS, the government intends to reduce dependence on proprietary software suppliers and strengthen the local industry.

Private sector

Haansoft is the leading company in the market. One of its subsidiaries, Hancom Linux, Inc., has around 80% of the market share in word processors and has had significant commercial success with its Linux developments for embedded software and computer applications. Its software operates in different languages, including English, French, German, Greek, Russian, Spanish and Japanese²¹³. According to declarations made in 2005 by Haansoft, then known as Hangul and Computer²¹⁴, Korea was facing a unique market situation, with Unix

210 Korean IT News, "Local Autonomous Governments To Adopt Linux Operating System," by Yun Dae-won, February 2004. http://english.etnews.co.kr/news/detail_top.html?id=200402230006&art_grad=9

211 <http://www.egov.vic.gov.au/index.php?env=-inlink/detail:m1159-1-1-8-s-0:l-687-1-1-->

212 <http://www.reallylinux.com/docs/linuxasiapac.shtml>

213 [http://ce.mdic.gov.br/SOFTWARE/Pais%20-%20Korea%20-%20The%20Status%20of%20Open%20Source%20Software%20\(OSS\)%20na%20Korea.pdf](http://ce.mdic.gov.br/SOFTWARE/Pais%20-%20Korea%20-%20The%20Status%20of%20Open%20Source%20Software%20(OSS)%20na%20Korea.pdf)

214 Hangul's word processor was the leading word processing package in Korea until the end of the 90s. Microsoft tried to buy the company in 1999.



dominating in the public sector and Windows in the private²¹⁵. Since then, Haansoft's Asianux has been able to gain ground on Unix in the public sector, and on Microsoft in the private sector.

Another heavyweight in the sector is Linux Security Inc.²¹⁶, which won tenders to supply Linux solutions to both the Korean and Chinese governments.

The industry with the greatest OSS adoption ratio is the banking sector. A well-known example was the implementation of the Internet banking system by the Korean Federation of Community Credit Cooperatives (KFCC). However, there have also been implementations in other sectors, such as the South Korean airline Korean Air's revenue management system, and various applications in hospitals, the National Cancer Centre and Seoul National University.²¹⁷

Universities

The Korean Ministry of Education launched the OSS-based NEIS (National Educational Information System) project²¹⁸. The system is intended to store data on all students, enabling schools to access and share information on-line as part of the Korean educational system's modernisation plan.

A large part of the effort in promoting OSS in Korea comes from the universities, such as Seoul University²¹⁹, for example. Industry and the government have reached various agreements to create local centres of excellence to provide training. One example is IBM, which agreed

215 Jong Jin Baek, CEO of Haansoft

216 www.linuxsecurity.co.kr

217 [http://ce.mdic.gov.br/SOFTWARE/Pais%20-%20Korea%20-%20The%20Status%20of%20Open%20Source%20Software%20\(OSS\)%20na%20Korea.pdf](http://ce.mdic.gov.br/SOFTWARE/Pais%20-%20Korea%20-%20The%20Status%20of%20Open%20Source%20Software%20(OSS)%20na%20Korea.pdf)

218 TechLearning, "Open Source in South Korea," by Jeremy Mereness, October 2006. <http://www.techlearning.com/article/13976>

219 <http://www.reallylinux.com/docs/linuxasiapac.shtml>

to create Linux centres to promote and provide training in OSS, such as the Linux Hub Centre at Seoul National University. Another example is the creation of a working group with the aim of standardising the software and hardware sector, with participation from companies such as Samsung Electronics, HanCom LINUX and Wow LINUX.²²⁰

Communities

The government also promotes initiatives involving the local adaptation and standardisation of Linux in Korea, such as Booyo, a Linux distribution for desktops and the leading Linux standard platform in Korea. Collaborating in this project are the Seoul Electronic and Telecommunications Research Institute (ETRI) and several local companies, among them Samsung and Haansoft²²¹.

The South Korean Software Industry Promotion Agency (KIPA) is a member of the Linux Foundation. This agency signed an agreement in 2004 with Brazil's National Information Technology Institute (ITI) in order to exchange information on experiences with OSS²²².

One of the latest initiatives by the Korean Government, specifically by the Ministry of Knowledge and Economy (MKE), has been to hold a worldwide contest for developers²²³, the Open Source Software Challenge 2009²²⁴. This was organised by the KIPA, the Korean OSS Association (KOSSA), and the Korea OSS Promotion Forum (KOPF). Sponsors included Samsung, Black Duck, Haansoft and the Linux Foundation, among others.

220 <http://www.techlearning.com/story/showArticle.php?articleID=193006191>

221 http://www.oss.or.kr/booyo/booyo_partner/index.htm

222 Software Livre.org, "Governo brasileiro assina acordo de cooperação com o governo coreano," [Brazilian Government signs a cooperative agreement with the Korean Government. 17 November 2004. <http://www.softwarelivre.gov.br/noticias/coreia>

223 <http://ldn.linuxfoundation.org/blog-entry/korean-oss-contest-opens-doors-worldwide-developers>

224 <http://ossproject.or.kr/international/>



With regard to the most important OSS projects without commercial aims, efforts are focused on local adaptation activities. The most active is the Korean Linux Documentation Project (KLDP)²²⁵, a community that develops and translates documents about Linux into Korean. It began activity in 1996, and today it is the largest Linux community in the country.

Linux user groups include the Linux Users Group²²⁶, the Korea Local LUG Association²²⁷ and Kyung Hee University Linux User Group²²⁸. In 2008, the Linux Foundation announced the opening of an office in Seoul²²⁹.

The SFAI Portal²³⁰ has led to many diverse initiatives since 2001. One of the first was to draw up a plan for the “Open Source Software Promotion Working Group” as part of the effort to support local industry. The aim was to create a plan to promote OSS (2002 to 2006) for the KIPA. Since then, various activities and seminars have been carried out.

Due to the importance of the embedded system in Korea, there are several Linux user organisations in this area, such as the private Korea Embedded Linux Project organisation²³¹.

The Korean Linux Council was created in 2000 as a private sector initiative, and now has more than 120 companies from the sector participating. This initiative is partially financed by the government, and in an effort to encourage OSS use it has created forums, conducted seminars, published successful cases of Linux implementation and organises the annual Linux Expo Korea.

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225 <http://kl dp.org/>

226 <http://www.lug.or.kr/home/>

227 <http://www.lug.or.kr>

228 <http://mirror.khlug.org/>

229 <http://www.highbeam.com/doc/1G1-179753007.html>

230 http://oss.or.kr/oss_eng/estabil_2007.php

231 www.kelp.or.kr/

4.4.4. Japan



Public Sector

In 2003, Japan signed a collaboration agreement²³² with China and Korea to develop and promote OSS and to replace proprietary operating systems. It budgeted several million euros for this project. One year later, it agreed to reduce software costs by using a Linux adaptation for the Asian market, Asianux²³³.

The Japanese hardware and computer industry, which includes large companies such as Sony, Matsushita Electric Industrial, Mits, Mitsubishi and NEC, has for some time been seeking an alternative to proprietary software to reduce the sector's high dependency on proprietary software providers. For this reason, initiatives like the one above are enthusiastically welcomed by manufacturers. Similarly, there is a great deal of interest by the Japanese Government in boosting local industry, which is why they have carried out multiple initiatives to foster OSS development and implementation in Japan.

In 2003, the government announced that it had accepted the proposal by Fujitsu, IBM Japan and Oki Electric Industry Co. to use Linux to manage the payroll and other types of personnel-related data for its 800,000 civil servants.²³⁴

Another government initiative was the agreement with a consortium of hardware and software companies²³⁵, among them Oracle, NEC, IBM, HP, Hitachi and Dell, to develop Linux-based servers and computers to be purchased by the Japanese Government.

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232 <http://www.builder.au.com.au/news/soa/China-Korea-and-Japan-close-to-open-source-deal/0,339028227,320278032,00.htm>

233 <http://news.zdnet.co.uk/software/0,1000000121,39150645,00.htm>

234 <http://www.crn.com/software/18823208;jsessionid=0ELRWVVC64H4RQE1GHPCKH WATMY32JVN>

235 <http://www.linuxworld.com/newsletters/linux/2007/0507linux2.html>



Some official organisations are promoting OSS, such as the METI and IPA. The Ministry of Economy, Trade and Industry (METI) has carried out activities and initiatives in order to promote OSS in the country and it has devoted a large annual budget to OSS development for operating systems, middleware, development tools and infrastructures. The Advanced Industrial Science and Technology Institute (AIST) conducts studies on OSS and provides support for annual meetings on OSS in Asia.

Private sector

Nearly 75% of large companies, those with more than 2,000 employees, use Linux on their servers, 45% use it on application servers and 25% in OSS databases, such as MySQL and PostgreSQL²³⁶.

Miracle Linux is the company that collaborates in the Asianux agreement. According to its Chairman, Linux is implemented in different sectors throughout Japan, such as the Administration, the banking sector, production and distribution companies, etc.

Other important companies in the sector are Plat's Home²³⁷, a leader in Japan that has its own SSD/Linux distribution and has developed a Linux-based server (OpenMicroServer) capable of supporting extreme temperature conditions; and Turbolinux, an OSS service provider since 1992.

In spite of the fact that the level of OSS adoption in Japan is still low, Gartner expects the number of implementations to rise, led by large companies with sufficiently large IT workforces²³⁸.

Universities

The Information Technology Promotion Agency (IPA) is a governmental research institute, and one of its working groups is the OSS Centre. It is collaborating with the Linux Foundation to promote the development of technology by supporting the use of open standards and OSS²³⁹. The collaborative agreement forms part of a mutual aid plan for the promotion of open standards to accelerate OSS adoption in Asia.

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236 Report: Open Source in Japan, 2008 www.gartner.com

237 <http://www.plathome.com/>

238 Report: Open Source in Japan, 2008 www.gartner.com

239 http://www.theinquirer.es/2007/10/02/la_fundacion_linux_se_asocia_con_el_gobierno_japones.html

One interesting OSS project is the Secure Virtual Machine, developed for the Japanese Government and involving the collaboration of the National Information Security Centre (NISC), Tsukuba University, Tokyo Technology Institute, Keio University, the Nara Institute of Science and Technology, the Toyota Technology Institute, Fujitsu, NEC, Hitachi, NTT, NTT DATA and SoftEther.

Communities

Some private groups also promote OSS, such as the not-for-profit association Open Source Group Japan, which was created in 2000 to promote the development and use of OSS²⁴⁰. Another is the Kansai Open Forum, an open source community that organises an annual forum²⁴¹. The Free Software Initiative of Japan, founded in 2002, is a Japanese not-for-profit association to promote OSS.

There are several user groups, such as the Japan Linux Users Group²⁴², Tokyo Linux Users²⁴³ and Linux Install Learning Osaka (LILO)²⁴⁴; as well as other types of groups, such as the TLEC (Tokyo Linux Entertainment Community), Tokyo Debian User Group, Tokyo OpenSolaris Users Group, YLUG (Yokohama Linux Users Group), Shibuya Perl Mongers²⁴⁵, Japan MySQL User Group, JBOSS, PostgreSQL, OpenOffice, Rubi and OpenStandia. Nearly 40% of developers interact with the international community, according to a survey of the Japanese community²⁴⁶.

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240 <http://www.opensource.jp/en/>

241 <http://k-of.jp/>

242 <http://www.linux.or.jp>

243 <http://tlug.jp/>

244 <http://lilo.linux.or.jp/index.html.ja>

245 <http://shibuya.pm.org/>

246 http://oss.mri.co.jp/floss-jp/short_summary_en.html



4.5. OCEANIA

The global ranking of this region of the Pacific on our map, in terms of the degree of advancement of the IS and OSS, reflects the result of its special interaction with other geographic areas.

On the path between Asia and America in geographic terms, and with a historic link to Europe (as members of the Commonwealth), Australia and New Zealand are among the most advanced countries in the world in terms of ICTs. Here, we see the highest percentages of Internet users as well as strong advances in the use of mobile phones, which have come to replace land lines, causing their use to gradually decline.

This situation has provided the right elements for the region to be one of the greatest contributors to OSS development, with all the factors that boost OSS coming together almost "spontaneously": a government that has established the foundations for OSS promotion, an educational system that provides specific OSS training in its universities, a dynamic, innovative private sector, open to the adoption of new technologies and the creation of companies around OSS to provide product support, and finally, communities of developers that make valuable contributions to OSS worldwide, participating in both national and international projects, thanks to a large degree to the excellent technical training received by employees in the region.

In this part of the world, the four key factors show a balance of forces that contribute to the continued, harmonious penetration of OSS in the region's economy.

The following provides information on specific initiatives in each country and the interaction of the four forces that determine the degree of OSS development in the country.



4.5.1. Australia



Australia is one of the countries that stands out for its OSS activity, particularly the participation of its communities on both a national and international level.

Public Sector

In 2005, the Australian Government's Information Management Office (AGIMO) approved a document stating that the different government agencies must decide for themselves whether to use OSS, based on standard criteria and the price-quality ratio²⁴⁷. It also published an OSS guide for the Public Administration²⁴⁸ which includes these criteria, strengthening the Australian Government's position with regard to OSS.

Similarly, the AGIMO, among whose objectives is the promotion of best practices in electronic administration, makes information on OSS available to users on its website²⁴⁹. At the end of 2007, the AGIMO organised the

247 http://www.finance.gov.au/e-government/better-practice-and-collaboration/events/2007/docs/Ann_Steward.pdf

248 <http://news.zdnet.co.uk/software/0,1000000121,39159783,00.htm> "A Guide to Open Source Software for Australian Government Agencies," Australian Government Information Management Office, 18 April 2005. <http://www.finance.gov.au/publications/guide-to-open-source-software/index.html>

249 <http://www.finance.gov.au/e-government/infrastructure/oss-resources.html>

seminar "Open Source Software in the Public Administration: Innovation and Lessons Learned," which dealt with license-related topics and showcased examples of successful OSS implementation in the public sector²⁵⁰.

At a regional level, the State of Victoria, the State of New South Wales (where the ICT sector is especially important) and the Australian Capital Territory are the areas with greatest government activity in OSS.

As part of its programme to promote OSS, in 2003, the State of Victoria approved a subsidy of €50,000²⁵¹ for the Open Source Victoria consortium, made up of more than 80 companies. Later, in 2005, a parliamentary committee recommended the use of OSS in electronic voting machines²⁵².

In 2003, the Australian Capital Territory became the first jurisdiction to issue a mandate according to which OSS must be considered as an option when purchasing in the public sector²⁵³.

In 2003, the State of New South Wales signed a contract with Sun Microsystems, which gave government agencies access to a special offer to purchase OSS²⁵⁴. In 2005, it approved a list of accredited companies specialising in OSS to facilitate the search for suppliers, reducing the time and money agencies had to invest to find them. The

250 <http://www.finance.gov.au/e-government/better-practice-and-collaboration/events/2007/open-source-software-in-government.html>

251 <http://lists.linux.org.au/archives/linux-aus/2003-November/009371.html>

252 Computer World, "Victorian government elects open source for e-democracy platform," by Michael Crawford, June 2005. <http://www.computerworld.com.au/index.php?id;1174965887;fp;16;fpid;0>

253 <http://www.computerworld.co.nz/news.nsf/UNID/54FB38BD414F3969CC256DF900123CCF?OpenDocument> <http://www.theage.com.au/articles/2003/12/10/1070732274118.html>

A.C.T. Legislation Register, Government Procurement (Principles) Guideline Amendment Act 2003.

254 ZDNet Australia, "Sun shines on NSW government desktops," by Andrew Colley, October 2003 <http://www.zdnet.com.au/newstech/os/story/0,2000048630,20280236,00.htm>



selected companies are both multinational and small local companies (CSC, Sol1, Starcom and System Integration Services)²⁵⁵.

In accordance with these government criteria, various public agencies have implemented OSS²⁵⁶, such as the Judicial Commission of New South Wales²⁵⁷, the HealthInsite newsletter project²⁵⁸, the National Institute of Statistics²⁵⁹ for its National Data Network, and the Australian Meteorology Office's VisAD project, in collaboration with the University of Wisconsin, among others.

The NICTA is a centre of excellence created by the government in 2002 with the aim of carrying out research, marketing and training in the area of ICTs, with collaboration from different Australian states and universities²⁶⁰. In 2009, the Centre launched OpenNICTA, a portal to promote software developed by NICTA under open source licenses. In addition, this portal promotes the benefits of collaboration, urging researchers to participate in NICTA's research and ideas through an open platform.

ASK-OSS (The Australian Service for Knowledge of Open Source Software), an academic initiative by the Department of Education, Employment and Workplace Relations, provides OSS-related advice

.....
255 NSW Legislative Council, excerpt on Open Source Software, April 2005. <http://www.parliament.nsw.gov.au/prod/parliament/hansart.nsf/V3Key/LC20050406027>

NSW Contract Information & User Guides, Information Technology and Communications. <http://www.nswbuy.com.au/>

256 Steve Alford, NOIE General Manager of Information Management Strategy and Governance, Gartner Open Source Conference, 2 September 2003. In November 2002, a report from Australia's National Office for the Information Economy (NOIE) described OSS use in different departments. <http://www.zdnet.com.au/insight/software/soa/Australia-sources-for-open-strategy/0,139023769,139161209,00.htm>

257 <http://www.finance.gov.au/e-government/better-practice-and-collaboration/events/2007/docs/04-Sagi.pdf>

258 http://www.finance.gov.au/e-government/better-practice-and-collaboration/events/2007/docs/08_McInerney.pdf

259 <http://www.finance.gov.au/e-government/better-practice-and-collaboration/events/2007/docs/Bartley.pdf>

260 University of Sydney, University of Melbourne, Griffith University, Queensland University of Technology and University of Queensland.

and promotes the dissemination of OSS in the field of research and higher education. ASK-OSS provides impartial, practical advice on different types of OSS that may be of interest for research, as well as the choice of appropriate licenses, the management of OSS development projects and the development of OSS communities.

The private sector in Australia has made a firm commitment to OSS, as is evident from a study showing that 50% of companies allocate 90% of their investments in R&D to OSS.

Private sector

In the private sector, the Australian industry makes significant investments in OSS research and development. According to a survey conducted by Waugh Partners, 50% of the companies responding to the questionnaire reported that 90% of their investments in R&D are allocated to open sources.

Australian companies have been successful in exporting their OSS products abroad. One example is the mobile phone operating system OKL4, developed by Open Kernel Labs, which is used in more than 300 million mobile phones and will soon be used in millions of digital decoders²⁶¹.

.....
261 <http://www.ok-labs.com/>



It is estimated that the OSS sector has an annual revenue of around €322m, of which 50% corresponds to revenue directly related to open sources.

Besides the ICT sector, the main sectors using OSS in Australia are the Public Administration, the defence, education and health sectors, wholesale companies and Communications services, with education, administration and defence being the areas showing the largest growth.

Universities

One of the best-known universities in the field of OSS is the IT faculty at the University of Queensland, where students are exposed to OSS from the first semester of their studies. This faculty uses OSS in its training programme and many of its professors actively contribute to OSS-related projects and development.

Moodle was created by Martin Dougiamas, who was a WebCT administrator at Curtin Technological University, in Australia. He based his design on the ideas of constructivism in pedagogy, which states that knowledge is built in the mind of the student, instead of being transmitted unchanged from books or teaching, and cooperative learning. The first version of this tool appeared on 20 August 2002. As of January 2010, it had a base of more than 32 million registered users, distributed over 45,682 sites around the world, and it has been translated into more than 81 languages.

Communities

According to a study published in 2008, based on surveys and interviews with players in the Australian OSS community, there is immense potential for OSS in the Public Administration, companies and education²⁶².

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262 Waugh Partners. The Australian Open Source Industry & Community Report 2008 <http://census.waughpartners.com.au/census-report-2008-r1.pdf>

Australia is home to both the Open Source Developers' Club and the Open Source Developers' Conference. This group of developers holds regular meetings and an annual conference in order to share knowledge and concerns about the different OSS programming languages.

The OSS community in Australia contains a wide variety of nationalities, with members from the United Kingdom, New Zealand, China and Germany, although most are Australian. It is a very active community and its contribution to the international community is widely recognised. According to a 2002 study by the Boston Consulting Group, Australia was one of the countries with the largest number of contributors to the community per capita, with nearly one third of these serving as project leaders²⁶³.

Australian associations and user groups are numerous and very active. For example, Linux Australia is an association bringing together the different Linux user groups and the vast open source community in the country. Among other activities, it organises the annual Conference of Australian Linux Users (CALU)²⁶⁴, an OSS conference recognised to be one of the best in the world from a technical point of view.

Another important national association in the Australian OSS sector is OSIA (Open Source Industry Australia). The aim of the OSIA is to promote the OSS cause in Australia and to help its 150 members improve their business success in this growing sector in the global ICT market.

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263 Waugh Partners. The Australian Open Source Industry & Community Report 2008 <http://census.waughpartners.com.au/census-report-2008-r1.pdf>

264 linux.conf.au



4.5.2. New Zealand



Public Sector

In 2003, the government approved a document requiring its different agencies to decide for themselves whether they should use OSS, based on standard criteria to determine if the software meets the needs of the department and the price-quality ratio²⁶⁵. It later carried out various initiatives to promote OSS in New Zealand, including guides, global supplier agreements, releasing code under open source licenses, etc.

The State Services Commission (SSC), in collaboration with the New Zealand Open Source Society (NZOSS), drew up a guide to advise government departments on evaluating and mitigating the legal risks associated with OSS use²⁶⁶.

*New Zealand's educational sector
is making a firm commitment to
OSS development.*

.....
265 <http://www.e.govt.nz/policy/open-source>

266 <http://www.e.govt.nz/archive/policy/open-source/open-source-legal2/>

In 2005, the government signed an agreement with Novell²⁶⁷, giving government agencies access to OSS at preferential prices. This followed the success of the pilot project with SuSe and OpenOffice in workstations carried out by the District Health Boards (DHB)²⁶⁸.

Recently, the State Services Commission agreed to release the code for the New Zealand Government's portal under a GPL license²⁶⁹.

Some implementations have been carried out in the Public Administration. For example, several departments use Plone to manage their website contents, such as Companies Office, a unit of the Ministry of Economic Development and one of the government websites with the most traffic in New Zealand.

Private sector

It is difficult to provide an estimate of the extent of OSS adoption in the private sector, since no surveys have been published in this regard, and private companies, unlike the public sector, do not publicise their migrations to OSS.

Sector experts believe that the penetration is greater than we think: "For each public organism that openly declares their OSS initiatives, there is probably another private organisation that has subtly and silently implemented OSS."²⁷⁰

The country's entrepreneurship, in which almost 60% of companies are small or newly created businesses, creates an ideal business foundation for OSS adoption, in terms of both the desire for cost reduction and the capacity to incorporate innovation in the organisation.

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267 <http://computerworld.co.nz/news.nsf/news/00A78590A3A229DBCC2570A40021DC61>

268 <http://softwarelibre.fox.presidencia.gob.mx/?q=node/36>

269 <http://computerworld.co.nz/news.nsf/tech/E53E8CAE4C30736DCC2574250031EAE7>

270 Mark Rais, "The State of Linux: Substantial Growth in New Zealand."



This innovative and creative capacity on the part of companies in New Zealand also serves as the ideal starting point for the emergence of technology companies that operate in the OSS field, contributing to the development and consolidation of OSS in the country.

In addition to the company Catalyst IT²⁷¹, specialising in developing critical business systems, other New Zealand companies such as Open Systems Specialist and Egressive also promote OSS products. Open Systems Specialist²⁷² defines itself as the leading independent supplier in New Zealand, specialising in virtualisation, security and Monitoring. Egressive Limited specialises in web applications built with Drupal, and in providing consultancy services to facilitate migration to OSS.

Universities

The greatest commitment to OSS has come from the field of education. There are numerous success stories, including the creation in 2008²⁷³ of a training centre (Open Source Learning Laboratory) financed by the Tertiary Education Commission (TEC) and developed at eduforge.org. There are some similarities with Google's Summer of Code, and module-based training is provided on Perl, PHP, Python, MySQL, etc., while students work on OSS-based applications²⁷⁴.

OSLOR (Open Source Learning Object Repository) is a project²⁷⁵ whose aim is to create a single repository for the academic sector. It is an initiative by the Waikato Technology Institute (Wintec).

Another initiative within the educational sector is the NZOSVLE (New Zealand Open Source Virtual Learning Environment) project²⁷⁶, which

271 <http://catalyst.net.nz/>

272 <http://www.oss.co.nz/>

273 <http://computerworld.co.nz/news.nsf/tech/E53E8CAE4C30736DCC2574250031EAE7>

274 <http://eduforge.org/projects/osll/>

275 <http://www.elearning.ac.nz/index.php?page=oslor&buttonset=1>

276 <http://www.opensourcereporter.net/nzedu.html>



benefits from collaboration with the New Zealand company Catalyst IT on the EduForge.org platform and is financed by the Tertiary Education Commission's e-Learning Collaborative Development Fund (eCDF)²⁷⁷. The project is an initiative from a consortium of twenty academic institutions, and its objective is to develop academic OSS-based applications²⁷⁸.

The eCDF is also financing the eXe project²⁷⁹, promoted by CORE Education, a not-for-profit academic research organisation. The aim of the project is to develop OSS that facilitates the publication of academic contents on the Internet for both professors and researchers.

277 <http://www.tec.govt.nz/templates/standard.aspx?id=755>

278 <http://pcf4.dec.uwi.edu/viewpaper.php?id=81>

279 <http://exelearning.org/>



Community

The NZOSS²⁸⁰, a not-for-profit organisation whose objective is to promote OSS use in New Zealand, launched the Public Sector Remix project in August 2009 to demonstrate the viability of OSS in workstations in the Public Administration²⁸¹. OSS will be used in national, regional and local public agencies, and the results will also be evaluated.

Other associations in New Zealand are the Linux user groups, including the New Zealand Linux Users Group²⁸², the New Zealand Zope and Plone User Group²⁸³, etc.



280 <http://nzoss.org.nz/>

281 <http://computerworld.co.nz/news.nsf/tech/83C4710E299C3A1BCC257623001997DC>

282 <http://www.linux.net.nz>

283 <http://www.nzzug.org/>

5.6. AFRICA

The economic situation on the African continent prevents the allocation of sufficient resources to ICT development. ICTs are not given priority in African countries, as they still have to attend to the population's basic needs.

However, OSS can help the African continent make its presence felt in the world of technology and information, become less dependent on first world countries, and allow for local adaptation of existing software.

The OSS community on the African continent is very fragmented. Minor efforts are being made in a scattered way, which is an obstacle to advancement.

FOSSFA is an organisation created to organise and lead the OSS movement in Africa, serving as a place to share all the initiatives across the continent²⁸⁴. With this objective in mind, one of the initiatives has been the creation of a project database. Moreover, FOSSFA supports the integration of OSS into national politics, and also coordinates and promotes OSS initiatives and the local software industry.

The main OSS projects focus on local adaptation. One of the most active communities in this matter is the South African translate.org.za. OSS is thus contributing significantly to bringing IS closer to the population of the African continent, overcoming the English language barrier in order to use ICT tools.

Thanks to the organisations that provide OSS training on the continent, there are more and more specialists in the market willing to support existing initiatives. Standing out among these is FOSSREC, a training project carried out by FOSSFA.

284 See <http://www.fossfa.org> and their action plan at http://www.wougn.net/ICTpolicy/docs/FOSSFA_ACTION_PLAN.rtf and <http://www.fossfa.org/database/>



There are different government policies on OSS, ranging from the non-existent to those which do not promote OSS over proprietary software, and finally to those which promote this type of software over proprietary software, as in the case of the South African Government. Tunisia is also active in OSS promotion, and Morocco is starting to consider the development of policies promoting it. The Senegalese Ministry of Infrastructure, Transport and Telecommunications is promoting OSS in order to develop the local software industry. Moreover, the Senegalese Government is seriously considering open standards in its future programmes.

The objective of the Ivory Coast's multimedia information system (SimGouv) is to establish a link between the government and its citizens through an open government platform. This OSS-based platform has fostered the creativity of local talent. The OSS network in Ethiopia (EFOSSNET) promotes OSS use, research and policies in the country.

Public organisations such as UNESCO are contributing to the expansion of OSS across Africa through projects such as the MIFTAAH memory stick, already implemented in Algeria, Libya, Morocco and Tunisia. OSS is provided in Arabic, English and French, with the academic institutions providing the main focus for running the project.

SchoolNet Namibia is a volunteer organisation devoted to providing Internet and computer access to every school in Namibia. The objective of SchoolNet Namibia is to make open source technologies available to all Namibian schools. Although it began as a support and training organisation, its success in introducing computers and the Internet into more than 200 schools since 2000 has led to SchoolNet becoming actively involved in developing policies at a national level in Namibia.

Mali's ICT Agency (AGETIC), in collaboration with Schoolnet, promotes OSS development in Mali, mainly in the education sector.

The AVOIR project is aimed at training and creating opportunities in Africa through ICT. The AVOIR team offers on-line learning services, as well as FOSS development and use services to the government and the education and business sectors.

We can also find newly created OSS companies, such as Linux Solutions in Uganda, PerfectSoft in Nigeria and Circuits&Packets in Kenya.

The following provides more detail about the position of OSS in South Africa. The study of the initiatives carried out in this country by the government and several non-governmental organisations, also in coordination with private companies from the ICT sector, shows South Africa to be the OSS leader and role model for the African continent, although the socioeconomic starting point may be quite different for each country.



4.6.1 South Africa

Public Sector

As in many other countries, the government is the main ICT client in South Africa. According to the State Information Technology Agency (SITA), government purchases represent as much as 70% of overall ICT spending in the country²⁸⁵. €352m was spent on proprietary software alone. With the objective of cutting ICT spending, the government opened a debate on OSS.

In fact, South Africa was the first African country to develop policies to promote the use of OSS in the country. The debate on the use of open standards and OSS in the government began in 2001, and was followed by the publication in 2002 of the report “Free/Libre & Open Source Software and Open Standards in South Africa”²⁸⁶. This report, issued by the National Advisory Council on Innovation (NACI), suggests the use of open standards as the basis for ICTs. The ultimate objective is to promote interoperability and universal access to e-Government at affordable costs, avoid restrictive licenses, minimise dependency on specific suppliers and promote the local software industry.

The Government Information Technology Officers Council (GITOC) later stated, in its report “Using Open Source Software in the South African Government”²⁸⁷, that OSS offers great educational and commercial advantages, and therefore open standards are a must for software development, and the use of OSS must be promoted by the government.

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285 Vital Wave Consulting. South African Adoption of Open Source <http://www.vitalwaveconsulting.com/insights/South-African-Adoption-of-Open-Source.pdf>

286 http://www.naci.org.za/pdfs/oss_v_1_0.pdf

287 <http://portal.acm.org/citation.cfm?id=1456677>

In 2003, the Department of Science and Technology (DST) sponsored the creation of the Open Source Centre²⁸⁸. The centre's objective is to promote the use of OSS in the government and the education sector.

The OSS law of 2006²⁸⁹ includes various aspects that actively promote and establish a preference for OSS over proprietary software: the government will use OSS unless the equivalent proprietary software is shown to be superior; migrations will be performed whenever equivalent OSS exists; all new software developed for the government, both internally and subcontracted, will be based on open standards and open sources, and under an open source license whenever possible; all content generated by the government will be open content, unless a need is demonstrated to the contrary; and finally, the government will promote the use of open standards and open content.

Private sector

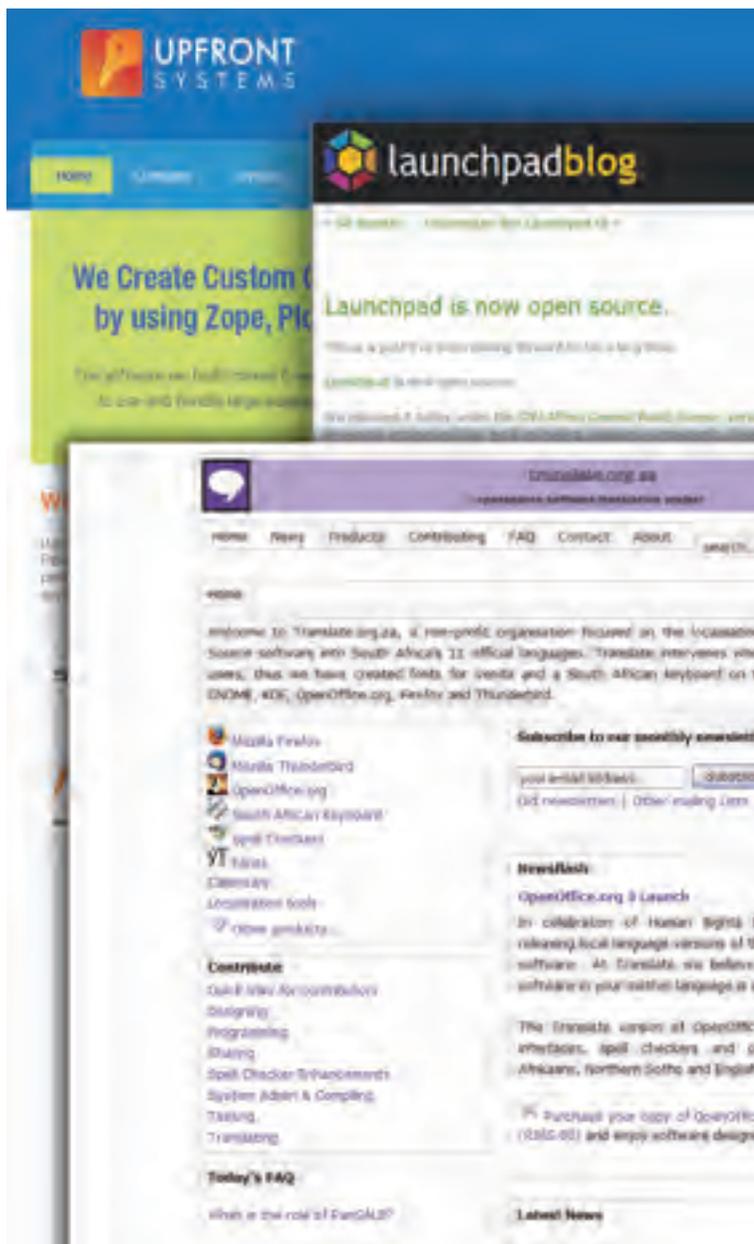
With regard to the private sector, although proprietary software generates significant income annually, South Africa has one of the most active OSS communities on the continent, which has led to the creation of many small and medium-sized local companies that offer OSS-based solutions.

One South African Linux distribution that had a successful period in the market was the Ubuntu-based Impi Linux. In 2005, Mark Shuttleworth purchased 65% of the company. In 2006, along with eight other companies, Impi Linux was awarded the contract from the State Information Technology Agency in South Africa. Recently, in 2009, the distribution was withdrawn from the market²⁹⁰.

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288 <http://www.infoworld.com/t/platforms/south-africa-taps-open-source-boost-local-it-572>

289 <http://www.oss.gov.za/wp-content/uploads/2009/03/foss-policy-approved-by-cabinet-2007.pdf>

290 <http://www.tectonic.co.za/?p=4668>



Mark Shuttleworth also owns the OSS company Canonical Ltd. The most important project²⁹¹ financed by the company is Ubuntu, a Linux distribution based on Debian, and its derivatives Edubuntu in education and Kubunto, which combines Ubuntu and KDE. Its other projects include Launchpad²⁹², TheOpenCD, an OSS collection for Windows that is no longer active, but continues to be used, for example in Ubuntu²⁹³ and Bazaar²⁹⁴, and a version control system or VCS. In 2009, Canonical launched a new service, Ubuntu One, which permits file synchronisation, storage and sharing with third parties.

Up Front Systems²⁹⁵ is another South African company working with OSS. It was the first company to work in OSS with Zope, Plone and Python in South Africa, and it has developed projects in the education, construction, health and pharmacy sectors.

Obsidian Systems has been one of the first South African companies to prepare candidates for the Red Hat certification, as Red Hat Certified Engineers. It works with several OSS products, such as Enterprise DB, JBoss, MySQL, Red Hat, Strataus, Ubuntu, Untangle, Zimbra and Zmanda.

The existence of all these flourishing OSS companies leads us to conclude that OSS is starting to penetrate significantly in the business sector, especially because it is not only Linux distributions we are talking about, but also OSS-based application servers and business management solutions.

Efforts by the government and organisations like the Shuttleworth Foundation in spreading the word on the advantages of OSS and in promoting its adoption (the Go Open Source campaign) seem to have

291 <http://www.canonical.com/projects>

292 <http://blog.launchpad.net/general/launchpad-is-now-open-source>

293 <http://theopencd.org/>

294 <http://bazaar-vcs.org/>

295 <http://www.upfrontsystems.co.za/>



yielded fruitful results in South Africa, creating promising prospects for OSS in the country, and making South Africa the leader and role model for the rest of the continent.

Universities

The OpenCourseWare (OCW) project by the University of the Western Cape (UWC) in South Africa, allows students and professors open use of the teaching and learning resources developed at UWC. The project has a two-fold objective: to provide the university community with easy access to the educational resources created by the institution itself, and to allow the local and regional community to benefit from UWC's rich knowledge base. The technical development of the on-line platform and the necessary software took place in collaboration with the UWC OSS Innovation Unit, as well as other collaborators all over the world.

The OCW project is driving through a programme to create a link to 14 other African universities. The project is called the African Virtual Open Initiative and Resource (AVOIR), and is directed and financed by UWC.

Communities

The public sector is not the only sector promoting OSS; many other organisations are working in this field. One example is Translateorg.za²⁹⁶, one of the main not-for-profit companies carrying out local adaptation activities. It is currently working on the translation of GNOME, KDE, OpenOffice.org, Firefox and Thunderbird into the 11 official languages in South Africa.

.....
296 <http://translate.org.za/>

The Shuttleworth Foundation is an organisation devoted to the promotion of OSS. Among its projects is one to install computer networks in schools in disadvantaged areas. This foundation, together with the South African Canonical company, Hewlett Packard and the CSIR Meraka Institute, launched the campaign Go Open Source. This campaign was active from 2004 to 2006, with the objective of raising awareness about OSS and achieving its adoption by users and SMEs.





05 ■ Methodology, Execution Team and Panel of Experts

In order to get an overview of the state of affairs for Open Source Software (OSS) around the world, a research study was carried out in all environments of the OSS ecosystem in the large geographical areas and the main countries within each of these. Namely, the study examined the initiatives carried out in the public sector environment, including those related to promotion, legislation or any other area, such as the use of OSS by the Public Administration. Similarly, it contains a description of all the activities aimed at the development and use of OSS in the private sector, in the communities of developers and in university and academic environments.

5.1. Methodology

Information was gathered through secondary sources and the most relevant sources used can be found in the bibliography at the end of this document. Footnotes have also been added that refer to on-line news items.

An on-line questionnaire answered by more than 70 OSS-related professionals was also used as an additional source of information. Finally, a series of interviews with OSS experts was conducted to obtain a deeper insight about certain topics and geographical areas. We would like to express our gratitude to them for their invaluable opinions and the time and interest they have devoted to this project. Among the contributors were professionals from the Dutch Antilles, Argentina, Australia, Brazil, Cambodia, Canada, Chile, Ivory Coast, Denmark, Spain, United States, France, Holland, India, Indonesia, Mauritius, Israel, Italy, Japan, Laos, Malaysia, Mongolia, Nepal, Norway, Pakistan, Portugal, United Kingdom, Czech Republic, Romania, South Africa, Sri Lanka, Switzerland, Taiwan and Vietnam.

As for the environments, 62% belonged to the private sector, 19% to the public sector, 7% to universities and 12% to OSS communities. A copy of the questionnaire can be found at the end of the document.

Two indices were created to determine the countries with the highest degree of OSS activity in each of the geographical regions: the IS Index and the Open Source Software Index. The countries with the highest OSS Index score were selected for each of the geographical regions. In Africa, which shows hardly any OSS activity as compared to continents such as North America or Europe, only South Africa was selected to represent the continent.

Four dimensions have been used to calculate the IS Index: the Economic, Social-Academic, Technological and Political dimensions. Each has its own specific weight, and its score was calculated using several variables.



The Economic dimension is made up of the following variables: GDP, GDP growth, Per capita income, Employment rate, TMT Index, Industrial R&D investment, Monthly broadband subscriptions, ICT presence in government offices and Innovative capacity.

The Social-Academic dimension includes the following variables: Population, Access to digital content, University enrolment, Internet access at school, University-industry research collaboration, On-line service availability and the e-Participation Index.

The Technological dimension takes into consideration the following variables: Internet penetration rate, Broadband penetration rate, International bandwidth per user (in bit(s)), Mobile telephone penetration, Internet hosts, Computers at home, Computer penetration, Internet at home and Internet use for business.

Finally, the Political dimension is made up of the following variables: ICT-related laws, Quality of the competition among Internet service providers, Priority given to ICTs by the government, Importance of ICTs in the government's vision for the future, Success in government promotion of ICTs, Purchase of latest-generation technology products by the government and the e-Government Readiness Index.

All of the variables in each dimension have been assigned a specific weight or weighting; with all the variables across all four dimensions adding up to 100%.

Similarly, four dimensions have been used to elaborate the OSS Index: the Economic, Social-Academic, Technological and Political dimensions. Each of these dimensions has its own specific weight, and its score was calculated using several different variables.

The Economic dimension is made up by the following variables: Degree of OSS development and Degree of OSS implementation.

The Social and Academic dimension includes the following variables: Societal participation in the open source software Community, Open source software training, Linux users groups, Level of interest in open source software, Availability of GNU/Linux distributions in the native language, Availability of Mozilla in the native language, Level of knowledge of OSS in the geographical area and Number of Linux users per capita.

The Technological dimension takes into consideration the following variables: The penetration of open source software in infrastructure software, Application development software, Business management software and Desktop and operating system software.

Finally, the Political dimension is made up of the following variables: Public sector purchasing policies promoting open source software, policies that support open source software development and Software non-piracy rate.

All of the variables in each dimension have been assigned a specific weight or weighting; with all the variables across all four dimensions adding up to 100%.

The values of each variable have been standardised and weighted for the calculation of both indices.

In order to create a standardised measurement of values, these are divided by the arithmetic mean of all the countries for that same variable. Once the values have been standardised, they are weighted according to the specific weight or assigned weighting for that variable. An index is calculated for each country analysed, resulting from adding up the standardised weighted values for each variable.

According to the calculated index, there are three groups of countries whose positions are always relative to the rest of the countries to which they are compared:

Advanced Countries: USA, Germany, France, Spain, Australia, Italy, United Kingdom, Norway, Finland, Denmark, Brazil, India, Sweden, China, South Korea, Estonia, Japan, Belgium, Canada, Ireland, Switzerland, Holland and New Zealand.

Less-advanced countries: Austria, Slovenia, Poland, Thailand, South Africa, Portugal, Malaysia, Bulgaria, Lithuania, Russia, Argentina, Venezuela, Hungary, Vietnam, Peru, Slovakia, Mexico, Croatia, Pakistan, Colombia and Czech Republic.

Developing Countries: Romania, Ukraine, Greece, Chile, Israel, Luxembourg, Uruguay, Turkey, Latvia, Tunisia, Egypt, Malta, Morocco and Cyprus.

5.2 Execution team

GENATIC

Pop Ramsamy - *Project Director*

Ana Trejo Pulido - *Research coordination*

PENTEO ICT ANALYST

Pilar Pedrosa

Anabel Labarta

Valéry Bisbal

5.3 Panel of experts

In AFRICA

<i>Name</i>	<i>Organisation</i>	<i>Country</i>
Nnenna Nwakanma	nnenna.org	Ivory Coast
Alexandre Tsang	Posterita	Mauritius
Amit Caleechurn	Fedora Project	Mauritius
Jaco Du Toit	UNESCO	Namibia
Dwayne Bailey	Translate.org.za	South Africa
Karl Fischer	Department of Science and Technology	South Africa
Nico Elema	GOV-OSS-RC	South Africa

In OCEANIA

<i>Name</i>	<i>Organisation</i>	<i>Country</i>
Bill Robertson	De Bortoli Wines Pty Limited	Australia
Brendan Scott	Open Source Law	Australia
Con Zymaris	Cybersource	Australia

In ASIA

Name	Organisation	Country
Francisco Javier Sola	Open Institute	Cambodia
Frederick Noronha	BytesForAll	India
Vineet Dahiya	InfoAxon Technologies Ltd.	India
Frederick Noronha	BytesForAll	India
Krishnan CN	AU-KBC Research Centre	India
Sitohang Benhard	Center for Empowerment of OSS, ITB	Indonesia
Masayuki Hatta	The University of Tokyo	Japan
Anousak Souphavanh	Laonux localization	Laos
Khairil Yusof	Inigo Consulting	Malaysia
Nurhizam Safie Mohd Satar	Asia e University	Malaysia
Sharuzzaman Ahmat Raslan	Open Source Community	Malaysia
Tan King Ing	MAMPU	Malaysia
L. Ariunaa	Intec Co. Ltd.	Mongolia
Subir Bahadur Pradhanang	FOSS Nepal Community	Nepal
Khurram Islam Khan	Open Source Resource Center	Pakistan
David Rigby	Free and Open Source Alliance	Singapore
Karthiga Ratnam	Lanka Software Foundation	Sri Lanka
Tzu-Chiang Liou	Institute of Information Science, Academic Sinica	Taiwan
Jochen Nessel	EdgeWorks Software Ltd.	Vietnam

In EUROPE

Name	Organisation	Country
Gijs Hillenius	OSOR	European Union
Jens Jakob Andersen	NITA	Denmark
Alvaro López Ortega	Octality, Cherokee Project, GNU	Spain
Carlos Hergueta Garellly	Red Hat Europe	Spain
Eduardo Serrano Belenguer	Open Xarxes Coop. V.	Spain
Francisco Angas Navasa	IBM Europe	Spain

(Continues on the following page)

Name	Organisation	Country
Jesús Bermejo	Telvent	Spain
Jordi Vilanova i Karlsson	Ferrero i Karlsson, SL	Spain
Muriel Moscardini	Fluendo	Spain
Pau Contreras Trillo	Oracle Europe	Spain
Sharmila Wijeyakumar	Pentaho	Spain
Cedric Thomas	OW2 Consortium	France
Jean Pierre Laisné	Bull	France
Miguel Valdes Faura	BonitaSoft	France
Herve Le Guyader	HLG Expertise	France
Arjen Kamphuis	Gendo	Holland
Wouter Tebbens	Free Knowledge Institute	Holland
Dirkjan Klip	Netherlands Open in Connection	Holland
Fabrice Mous	Ictivity	Holland
Alon Swartz	TurnKey Linux	Israel
Paolo Predonzani	ManyDesigns srl	Italy
Stefano Celati	Bnova	Italy
Giovanna Sissa	Osservatorio Tecnologico per la Scuola	Italy
Anders Bjerkholt	Moava AS	Norway
Heidi Austlid Arnesen	Friprog, the Norwegian Competence Centre	Norway
Diogo Rebelo	Dri	Portugal
Goncalo Salgado	log	Portugal
Lucio Quintal	Madeira Tecnopolo, S.A.	Portugal
Anas Tawileh	International Development Research Centre	United Kingdom
Caroline Stewart	Jaspersoft	United Kingdom
Gerry Gavigan	Open Source Consortium	United Kingdom
Filip Molcan	OSS Alliance	Czech Republic
Doru ilasi	Aplix	Romania
Lucian Savluc	eLiberatica	Romania
Bruno von Rotz	accellIT GmbH	Switzerland
David Krebs	mimacom ag	Switzerland

In LATIN AMERICA

<i>Name</i>	<i>Organisation</i>	<i>Country</i>
Ace Soares	Suares & Co	Dutch Antilles
Bernardo Diego González	Open Computación S.A. / CADESOL	Argentina
Gerardo Renzetti	Morfeo Cono sur	Argentina
Dario Rapisardi	The Gleau Inc.	Argentina
Martín Olivera	SOLAR Software Libre Argentina	Argentina
Junior Alex Mulinari	Solis	Brazil
Renato da Silveira Martini	ITI	Brazil
Rubens Queiroz de Almeida	Universidade Estadual de Campinas	Brazil
Leo Barrientos C.	Open Sistemas Chile	Chile
Jens Hardings	Pontificia Universidad Católica de Chile	Chile
Martin Levenson	CETRATEC	Mexico

in NORTH AMERICA

<i>Name</i>	<i>Organisation</i>	<i>Country</i>
Andrew Ross	Free and Open Source Software Learning Centre	Canada
Dru Lavigne	Open Source Business Resource (OSBR)	Canada
Jeff Hobbs	ActiveState Software	Canada
Bernard Golden	Navica	United States
Bryan Cheung	Liferay Inc	United States
Deb Woods	Ingres Corporation	United States
Deborah Bryant	OSU Open Source Lab	United States
John M Weathersby	OSS Institute	United States
Matt Ray	Zenoss	United States
Nick Carr	Red Hat	United States
Phil Robb	Hewlett Packard	United States
Tanya Gupta	DC Technology Examiner	United States



06



06 ■ Bibliography

This section includes all the source documentation used for writing the report "International Status of Open Source Software (OSS)."



The selected OSS-related documents refer to a specific geographical region (North America, Latin America, Europe, Africa, Asia or Oceania-Australia), to areas of interest (Public Sector, Private Sector, Universities and R&D Centres, OSS Communities, Technology, Law, etc.) or to both.

The main sources used for finding secondary sources have been the Internet, market research reports from specialized firms such as Gartner, Optaros or Forrester, on-line publications from official organisations such as CENATIC and OSOR and documentation provided by all those interviewed throughout the project.

References are documented and are accompanied by notes summarising their content.

Two criteria have been used for organising the bibliography. The first is the area of interest (Public Sector, Private Sector, Universities, R&D Centres and OSS Communities). Within each area, there has been a geographical classification (North America, Latin America, Europe, Africa, Asia and Oceania-Australia). Only the technology, law and Information Society areas have not been sub-classified by geographical area, as they are considered to be cross-border topics.

In cases where the documented publication does not apply to a specific geographical region and deals with general topics worldwide, it has been included in a subsection at the beginning of each chapter, referred to as the Introduction.

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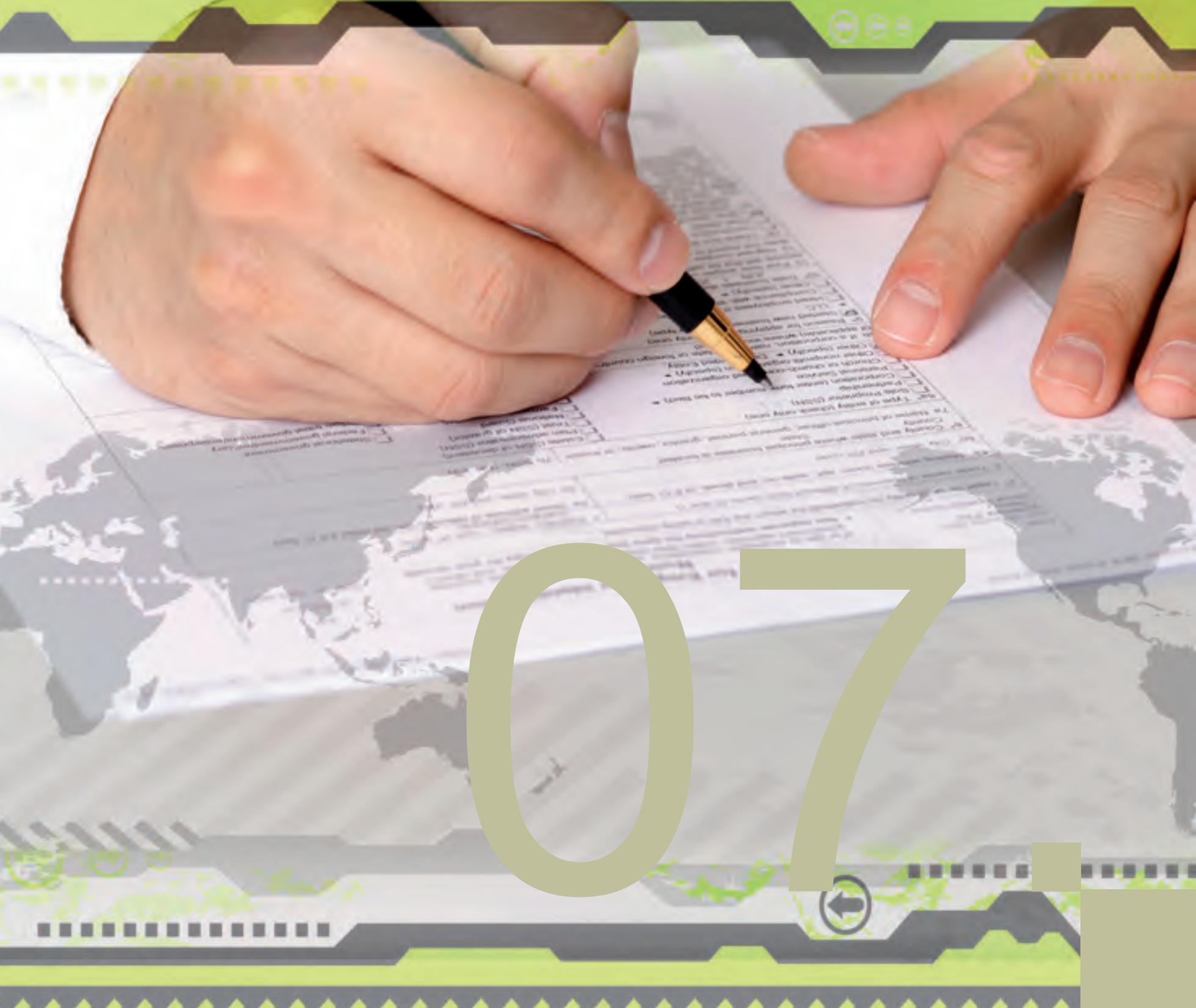
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07

07 ■ Appendices

- Questionnaire for the PRIVATE SECTOR.
- Questionnaire for the PUBLIC SECTOR.
- Questionnaire for UNIVERSITIES.
- Questionnaire for COMMUNITIES.

7.1. Questionnaire for the private sector

1. How would you rate the level of familiarity with/awareness of open source software (OSS) in your country? (Please select one of the following options: Very low, Low, Medium, High, Very high.)

2.1. How would you rate the level of OSS use by private companies in your country with regard to the following technologies? Please explain your answers. (Please select one of the following options for each technology: Very low, Low, Medium, High, Very high.)

- *Software Infrastructure*
- *Business Applications*
- *Application Development*
- *Operating systems and desktop applications*

2.2. In your opinion, what are the trends for use going to be over the medium-term? (For the 4 technology groups mentioned above: Software Infrastructure, Business Applications, Application Development, Operating systems and desktop applications.)

3. What have been the main benefits for private companies in your country as a result of adopting OSS?

4. What are the main barriers that prevent private companies in your country from adopting Open source software?

5. What are the 5 main private OSS development companies in your country?

6. What are the 5 main private companies in your country that market OSS?

7. Main OSS projects carried out by private companies in your country: (Please give a brief description of the projects and indicate the main players in them.)

8. Main OSS Communities linked to private companies in your country.

9. Please give a brief description of the management method used by the OSS Community in your company.

10. Are there any private or public associations in your country promoting the adoption of OSS? If so, please include their name and main activities.

11. Considering the fact that OSS is not always distributed through traditional channels, what channels are used by OSS companies to contact potential clients?

12. In your opinion, what are the main factors (political, economic, social, etc.) that promote OSS adoption by private companies in your country?

7.2. Questionnaire for the public sector

1. How would you rate the level of familiarity with/awareness of open source software (OSS) in your country? (Please select one of the following options: Very low, Low, Medium, High, Very high.)

2.1. How would you rate the level of OSS use by the public sector in your country with regard to the following technologies? Please explain your answers. (Please select one of the following options for each technology: Very low, Low, Medium, High, Very high.)

- *Software Infrastructure*
- *Business Applications*
- *Application Development*
- *Operating systems and desktop applications*

2.2. In your opinion, what are the trends for use going to be over the medium-term? (For the 4 technology groups mentioned above: Software Infrastructure, Business Applications, Application Development, Operating systems and desktop applications.)

3. What have been the main benefits for the public sector in your country as a result of adopting OSS?

4. What are the main barriers that prevent the public sector in your country from adopting OSS?

- 5. What are the main challenges and benefits for the public sector in your country with regard to activities promoting OSS?**
- 6. What are the main consequences (positive and negative) of activities promoting OSS in the public sector in your country?**
- a. *E-government services*
 - b. *the Economy*
 - c. *Information society*
 - d. *Community development*
 - e. *Other*
- 7. Main policies or recommendations made by the public sector with regard to OSS use or public tenders (including interoperability and open standards.)**
- 8. Main OSS projects carried out by the public sector (either in-house or subcontracted developments.)** (Please give a brief description of the projects and indicate the main players in them.)
- 9. Main public or semi-public OSS organisations and the main projects carried out.** (Please give a brief description of the projects and indicate the main players involved.)
- 10. Have any initiatives been carried out combining the public sector and private OSS development companies in your country?** If so, please name them and briefly describe them.
- 11. Have any initiatives been carried out combining the public sector and universities in your country?** If so, please name them and briefly describe them.
- 12. Have any initiatives been carried out combining the public sector and OSS Communities in your country?** If so, please name them and briefly describe them.
- 13. In your opinion, what are the main factors (political, economic, social, etc.) that encourage the use of OSS by the public sector in your country?**

7.3. Questionnaire for universities

1. How would you rate the level of familiarity with/awareness of open source software (OSS) in your country? (Please select one of the following answers: Very low, Low, Medium, High, Very high.)

2.1. How would you rate the level of OSS use by universities in your country with regard to the following technologies? Please explain your answers. (Please select one of the following options for each technology: Very low, Low, Medium, High, Very high.)

- Software Infrastructure
- Business Applications
- Application Development
- Operating systems and desktop applications

2.2. In your opinion, what are the trends for use going to be over the medium-term? (For the 4 technology groups mentioned above: Software Infrastructure, Business Applications, Application Development, Operating systems and desktop applications.)

3. What have the main benefits been for universities in your country as a result of adopting OSS?

4. What are the main barriers that prevent universities in your country from adopting OSS?

5. In your opinion, what are the main contributions made by universities in your country to the adoption of OSS?

6. What are the main OSS projects carried out by universities in your country? (Please give a brief description of the projects and indicate the main players involved.)

7. Please describe some examples of cooperation between universities and OSS development communities in terms of OSS.

8. Please describe some examples of cooperation between universities and private OSS companies in terms of OSS.

9. How would you rate the level of support received by universities in order to carry out OSS development projects? (Please explain your answer.)

a. Very low

b. Low

c. Medium

d. High

e. Very high

10. What type of support do universities receive in order to carry out OSS development projects?

11. What are the main organisations that provide support to universities?

12. Are there any institutional policies regarding the contribution made by staff to OSS projects in your country? Please explain any such policies.

13. What types of measures are taken by universities to promote participation in OSS development projects?

14. In your opinion, does the education available in your country allow for OSS development?

15. Does the existing training match the needs of the labour market?

7.4. Questionnaire for communities

1. How would you rate the level of familiarity with/awareness of open source software (OSS) in your country? (Please select one of the following options: Very low, Low, Medium, High, Very high.)

2.1. How would you rate the level of OSS use by private companies in your country with regard to the following technologies? Please explain your answers. (Please select one of the following options for each technology: Very low, Low, Medium, High, Very high.)

- *Software Infrastructure*
- *Business Applications*
- *Application Development*
- *Operating systems and desktop applications*

2.2. In your opinion, what are the trends for use going to be over the medium-term? (For the 4 technology groups mentioned above: Software Infrastructure, Business Applications, Application Development, Operating systems and desktop applications.)

3. How would you rate the level of development of OSS Communities in your country? (Please explain your answer.)

- Very low*
- Low*
- Medium*
- High*
- Very high*

4. How would you rate the level of support received by OSS Communities in order to carry out OSS development projects?

(Please explain your answer.)

a. *Very low*

b. *Low*

c. *Medium*

d. *High*

e. *Very high*

5. What type of support do OSS Communities receive in order to carry out OSS development projects?

6. What are the main organisations/bodies that provide support to OSS Communities?

7. What financial model is used by OSS Communities in your country? (Sources of income)

8. What are the main reasons for participating in an OSS Community?

9. What are the main OSS projects carried out by OSS Communities in your country? (Please give a brief description of the projects and indicate the main players in them.)

10. Are there any clear trends regarding the type of projects carried out by OSS Communities in your country? Please briefly describe the trends.

11. Please give a brief description of the management method used by your OSS Community.

12. Please name the main countries from which developers make contributions to your OSS Community.

13. What private companies are currently actively involved with OSS Communities in your country?

14. Please describe some examples of cooperation between universities and OSS Communities.

15. Please describe some examples of cooperation between private companies and OSS Communities.

16. *Please describe some examples of cooperation between the public sector and OSS Communities.*
17. *What have been the main benefits for private companies in your country as a result of adopting OSS? And for private users?*
18. *What are the main barriers that prevent private companies in your country from adopting open source software? And for private users?*
19. *What are the 5 main private OSS development companies in your country?*
20. *In your opinion, what are the main factors (political, economic, social, etc.) that promote the adoption of OSS in your country?*

Information and communication technologies, hereafter ICTs, take a key role as a basic element of competitiveness, promoters of innovation and key factors in the knowledge society. Nowadays, more than half of the increase in productivity in Europe is generated by ICTs, not only in terms of the investment they represent, but also as an agent directly involved in improving the efficiency of the remaining economic sectors.

ICTs will continue to be a driving force in our economies in the future. We are still at an early stage in the exploitation of all the possibilities they currently offer, but we can already glimpse some elements that will become opportunities for growth. One of these elements is the extraordinary generalization of ICTs, which makes them accessible to any user, rather than being limited to experts. As a result, users can simultaneously benefit from them and play an active role in them. Moreover, there is the already-existing trend of exploiting the potential of cloud computing and social networks, as well as the application of collective intelligence provided by crowdsourcing, a term coined by Jeff Howe in 2006, according to which collective mass participation in development projects generates better ideas and more innovative products.

Finally, these developments will be characterised by interoperability. This will allow systems and applications to form a transparent service network over which knowledge can easily spread and be used in ways that are still difficult for us to foresee.

Interoperability, crowdsourcing, collective intelligence, generalisation, cloud computing and social networks... All these concepts are closely related to collective construction. The distinguishing feature of Open Source Software, that results in development sharing among companies, administrations and citizens all over the world, as well as transparency, efficiency and technological independence. The impact of Open Source Software on our society continues to grow, and it is one of the values of the Network Society. Open technologies are already part of the technological reality for citizens, companies and the public administration, as their benefits have led to them being chosen as a result of conscious and thorough selection processes.

The CENATIC Foundation, in keeping with its objective of raising awareness about open source technologies, regularly releases research reports that study the different aspects of open source software. The ultimate aim of these reports is to boost the competitiveness of the Spanish business sector by providing information about the business opportunities offered by these technologies and identifying international projects that can be implemented and applied to Spanish society.

The report we present here analyses the international Status of Open Source Software, enabling us to put the current situation in Spain in context based on the knowledge of technology trends around the world, the promotion and use of open technologies in the Spanish Private and Public sectors, and the contribution of Spanish Communities of Developers and Universities to important initiatives on an international scale.

It is, in conclusion, a thorough overview of the international context of open source software, creating a starting point for the identification of new business opportunities for Spanish companies, and new fields of study for CENATIC to continue promoting the use and development of open source software in Spain.

Francisco Ros Perán

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President of CENATIC Board of Trustees*

National Open Source
Software Observatory

