

Open-Source Software Running for Public Office

Nikos Drakos, Andrea Di Maio, Robin Simpson

Government attitudes are spurring interest in open source as an alternative to today's leading commercial software. Case studies and analyses demonstrate the risks and benefits of open software in the public sector.

ANALYSIS

The public sector's interest in open source seems to be intensifying as many governments turn to freely available software in the belief that it is quick and inexpensive to implement, and that it can be tailored to their needs. Some see it as a shortcut to their technological independence and as a basis for their future IT capabilities. A combination of factors has contributed to these beliefs:

- A reaction to the cost implications of new, fixed-term software license fees introduced by several large commercial software vendors
- Significant lobbying activities by commercial vendors that support open-source software as a business strategy
- Antitrust cases that have raised the profile of Microsoft as the software industry's most-dominant vendor
- The realization by several governments that technology expenditures have not benefited local players, but rather foreign, mostly U.S.-based, vendors
- Heavy investments in e-government have been made without ascertaining their sustainability over time. Many governments are looking at open-source software for the "perceived" savings and ease associated with its implementation, as well as its flexibility
- The widening of choice in "good enough," supported open-source products

Recent cases of governments supporting open source are:

- Using open-source software in public-sector data centers
- Mandating the use of open-source software by government departments
- Channeling public funds to large-scale open-source development

Here, we take a closer look at some of these cases and explore the expectations and justifications behind the decisions to use open source in terms of potential benefits.

In any large IT environment, commercial software has coexisted with open-source software for years, and the public sector is no exception. A recent survey by the Interchange of Data between Administrations (IDA) on behalf of the European Commission (www.europa.eu.int/ISPO/ida) looking at open-source software use in public administrations in Europe showed that 63 percent of the interviewees said they already use open-source software — although such use is typically limited to dedicated Web or file servers. Another recent survey also on behalf of the European Commission (www.infonomics.nl/FLOSS/report/) shows that public-sector organizations in Germany, Sweden and the United Kingdom have above-average use and planned use rates compared to other for-profit sectors (37 percent and 31 percent, respectively).

Still, despite levels of actual use, open-source software exists largely in a state of policy "limbo" between calls for wider adoption and positive action, and approaches to ensure fair treatment and inclusion. It is not officially sanctioned nor explicitly prohibited. In most cases, different products are introduced tactically by a local administrator or developer to solve a specific problem and then continue to be supported and maintained internally in an "ad hoc" manner. However, public-sector CIOs, as well as policymakers, are starting to recognize the presence of open-source software in their organizations and to refine their attitudes toward it. (See "Conference Can't Agree on Open Source's Role in Italy" and "Australian Government Considers Open Source's

Role" for examples of the debate involving politicians and government IT executives.) Potential benefits fall into broad categories:

Economic Benefits

Much of the recent public-sector interest is motivated by the quest for cost savings. The expectation is that the absence of up-front license fees and the availability of community-based support can lead to lower costs. Although license fees are usually only a fraction of the total cost, they look like a more-significant cost factor in economies where labor and support costs are much lower. A case study on open-source software deployment in Brazil highlights this point (see "Using Open Source in Community-Based Projects").

Although open-source software has some obvious acquisition cost advantages, enterprises must look at its longer-term total cost of ownership, which will vary depending on context and circumstances. Licensing costs are a fraction of the total cost of ownership of most software products. Additional outlays for maintenance and support may negate any licensing cost savings.

An indirect benefit of the consideration of open-source software in public-sector procurements is that it can be used to boost a user's negotiating position. This is particularly important in product or geographic markets dominated by a single vendor. Enterprises can deploy open-source software on a small scale within their organizations to break a monoculture, reduce their dependency on any one vendor and, in the process, negotiate better terms for commercial software deployments. This approach will likely lead to increased costs in having to manage a more-heterogeneous environment, and such costs will need to be balanced against potential savings.

Public-sector agencies may derive further economic benefits from the adoption of open-source development "share and reuse" best practices. A June 2002 report on pooling open-source software commissioned by the European Commission suggested that software pooling between public administrations is not aiming to promote open source against proprietary software, but to optimize public investments by sharing public administrations' developed software.

Quality and Flexibility

The public sector has been, and probably still is, the largest benefactor of open-source software development through research and development (R&D) and university funding. In a survey of nearly 3,000 open-source developers, about 25 percent were related to universities (students, university IS organizations and other staff). Thirty-seven percent of all open-source developers in the survey were educated at least to a master's or Ph.D. level. The combination of highly skilled technical personnel and the unique software requirements of some scientific research may lead to innovation and custom development. The momentum behind the use of the open-source programming language Practical Extraction Report Language (PERL) in several genome research centers (see <http://bioperl.org>) and the more general development of open-source software for bioinformatic research (largely by <http://bioinformatics.org>) exemplify one such symbiotic relationship between open-source software and scientific research.

In a different context, a report from The Mitre Corp. for the U.S. Department of Defense (DOD) in October 2002 underlines the role that open-source software already plays, not only in R&D programs but also in production, mission-critical applications. Its conclusions — which don't necessarily reflect the DOD view — are that open-source applications "... are most important in four broad areas: Infrastructure Support, Software Development, Security, and Research [... and] policy that bans any use of FOSS [free and open source software] products would likely have interesting (and largely negative) short-term and long-term impacts on DOD cost, reliability and capability."

Even in mainstream public-sector deployments, the most important reason for the adoption of open-source software in the cases we have looked at primarily relate to quality issues (such as stability, maturity, security and adherence to standards) and, to a lesser extent, flexibility (for example, modularity, ability to integrate or customize through access to the source code). However, although dozens of quality open-source products exist, there is no guarantee that every open-source product is of high quality. Product evaluation is as relevant for open-source software as it is for commercial products.

National Interest

Argentina, Colombia and Peru are proposing extreme preferential legislation for open-source software, mandating its use wherever possible (see "Peru's Open-Source Initiative Needs the Private Sector, Too"). Behind this approach lies long-term strategic objectives, often expressed in terms of "national interest." Such objectives include:

- Open-source software is initially seen as a shortcut to technological independence in terms of satisfying internal technology needs with local skills and resources, while at the same time building a basis for future service and product exports. This goal has more immediacy where there is a strong need to conserve foreign currency reserves. HancomLinux (<http://en.hancom.com/index.html>) in South Korea and Conectiva in Brazil (<http://en.conectiva.com>) are examples of organizations that are not only servicing local users, but also breaking out into new markets. Hancom Linux is promoting its Arabic version of Linux (based on Red Hat Linux) as well as its office suite in the Middle East, for example.
- For some of the emergent economies in Latin America or Africa, the ability to introduce IT more widely — in schools, businesses or the public sector — is limited, to a large extent, by up-front software costs. A preferential attitude toward open-source software is justified in terms of narrowing the "digital divide."
- In many economies with high levels of computer use but weak intellectual property protection, a different problem exists. The Business Software Alliance estimates computer piracy levels in 2001 of more than 50 percent in Eastern Europe, Latin America, Asia/Pacific, the Middle East and Africa (www.bsa.org/usa/policyres/admin/2002-06-10.130.pdf). China's piracy levels are estimated at 92 percent, while lost revenue due to piracy in Asia/Pacific is put at \$4.7 billion. The World Trade Organization is requiring members (new or otherwise) to comply with the 1994 agreement on Trade-Related Aspects of Intellectual Property Rights. However, converting all of the pirated software into licensed software could have a negative impact on some emerging countries' economies because of a slowdown in technology adoption or in terms of currency reserve depletion. A recent report prepared for the U.K. government by a special body set up to look at intellectual property rights issues (www.iprcommission.org/) pointed out that open-source software can be used to absorb some of the shock from an antipiracy clampdown.
- A final benefit that open-source software provides in terms of national interest is that it enables users to avoid the risk of "spyware" hidden in the closed proprietary code of commercial software. Although there is no evidence, there is a possibility — however unlikely — that some commercial vendor software may contain "back doors" that allow monitoring and spying by U.S. and other foreign government agencies. Microsoft's Shared Source Initiative, and recently the more extensive Government Security Program, have been designed in part to address such fears — however irrational they may be. We expect that other software vendors will increasingly have to do the same to keep or win government contracts.

Social Benefits

Most social benefits are usually about bridging the "digital divide" by improving access to technology. The flexibility of open-source software, which can be adapted to meet specific local requirements, makes it a good choice in many technology access and education projects. A citizen access project in India has spawned the Simputer personal digital assistant (www.simputer.org/simputer/faq), while the regional government in Extremadura in Spain has gone so far as to sponsor the development of a local version of Linux (www.linex.org).

Open-source software represents a new technology "playing field" with unusually low entry barriers for those who would like to participate as developers in its evolution beyond being passive consumers. However, longer-term strategic benefits will differ from country to country. Public-sector organizations and agencies must determine the extent to which they commit to, promote and require open-source software (see "Public Sector Needs Balanced Open-Source Software Policy")

Features

"Open Source Congress Shows the Full Spectrum of Policy Options" — Government organizations must make informed decisions about the suitability of open-source software on a case-by-case basis. **By Andrea Di Maio**

"Australian Government Considers Open Source's Role" — Government agencies should use total cost of ownership models to determine if a "strategic" commitment to open-source software will achieve benefits greater than license cost savings alone. **By Richard Harris, Robin Simpson and Steve Bittinger**

"Using Open Source in Community-Based Projects" — The Brazilian state of Rio Grande do Sul is using open-source software to improve communication and collaboration among its schools. **By Waldir Arevalo**

"Peru's Open-Source Initiative Needs the Private Sector, Too" — Peru is mandating the use of open-source software across its government agencies as a way to extend data to its citizens and reduce the problem of pirated software. **By Maria-Luisa Kun and Luis Anavitarte**

"Public Sector Needs Balanced Open-Source Software Policy" — Policies that encourage the consideration of open-source software alongside commercial options carry little risk and can have a beneficial impact in widening choices. **By Nikos Drakos, Andrea Di Maio and Waldir Arevalo**

This research is part of a set of related research pieces. See "A Look at Alternatives to Microsoft" for an overview.

REGIONAL HEADQUARTERS

Corporate Headquarters
56 Top Gallant Road
Stamford, CT 06902-7700
U.S.A.
+1 203 964 0096

European Headquarters
Tamesis
The Glanty
Egham
Surrey, TW20 9AW
UNITED KINGDOM
+44 1784 431611

Asia/Pacific Headquarters
Level 7, 40 Miller Street
North Sydney
New South Wales 2060
AUSTRALIA
+61 2 9459 4600

Latin America Headquarters
Av. das Nações Unidas 12.551
9 andar—WTC
04578-903 São Paulo SP
BRAZIL
+55 11 3443 1509