Giving away secrets: can open source convert the software world?

For many people in developing countries, commercial software packages are not an option because they are expensive, do not come in local languages and cannot be shared. Yet the fact remains that software – and other information and communication technologies (ICTs) – is becoming increasingly crucial to social and economic development.

In today's world, the development of nations depends not only on the free flow of information, but also on people's ability to control and adapt the information as they see fit. This latter need is particularly important when it comes to software packages, and is globally acknowledged by governments, local authorities, educational institutions and civil society. However, the reality is that commercial software companies continue to have a proprietary hold over software packages sold and used in developing countries, and restrict the way the software can be used.

Media toolkit on information and communication technologies (ICTs)

This is the fifth in a series of short briefing documents for journalists on different aspects of ICTs and the 'information society'. It is offered as a service to non-specialists, and in particular to journalists wishing to cover information society issues.

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Commercial software companies spend large amounts of money on research and development and say they need to restrict the use of their software in order to recover these costs.
CHRIS STOWERS | PANOS PICTURES

This concern has led to an international movement for software packages that can be bought cheaply, shared freely and changed around and developed as the users want. Advocates of this movement, known as Free and Open Source Software, or FOSS, say the tools of information and communication should be in the public domain so that they can generate greater knowledge sharing in society.

Commercial software companies counter this by saying that they spend huge sums of money on the research and development of software, and that, just like any other commercial venture, they need to restrict usage in order to recoup the investments.

How can these opposing views be reconciled in the interests of millions of potential software users in the developing world?

Why is this issue important for the media?

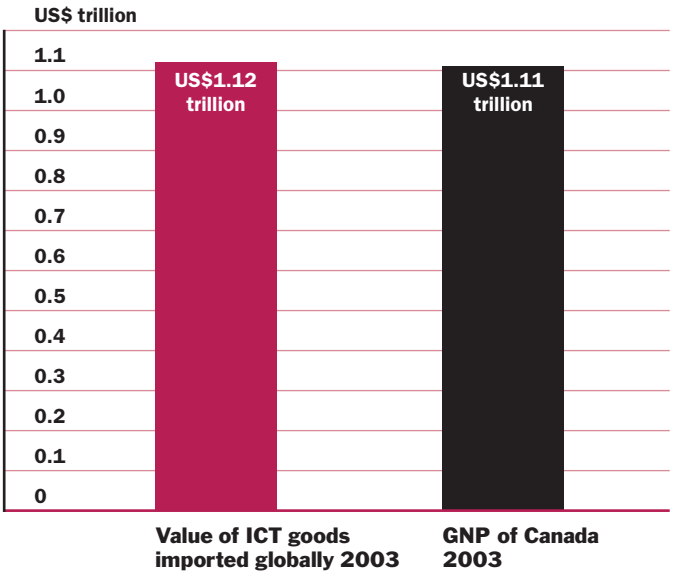
As with any other technology, the purchase of software by governments – or any other accountable institution – should be subject to media scrutiny. It is important for the media to investigate the reasons why governments opt for a particular software package, rejecting others, and to examine the mutual benefits and disadvantages. In a sense, this exercise is no different from reporting on any other routine government procurement – except that the sales of software are often worth billions of dollars. Is it money well spent? Are there any alternative options and are our governments aware of them? Was the process of procurement open and transparent? And what is the deal? Will the government have access to the software's source code, the original program instructions, or is such access limited?

The IBM global financing report in 2005 said that software and services form the largest and fastest-growing part of the information technology market. The report assessed that commercial and government entities were expected to have spent more than US$697 billion on software and services in 2004 accounting for more than 72 per cent of the total information technology market.

Free and open source software has the potential to offer journalists more access to information and has become an important presence in the independent media movement.

With FOSS, journalists' ability to share, exchange and process information would be increased with no extra costs.

The media can play a vital role in promoting the debate on proprietary versus open source software. The media is no stranger to this debate: a similar debate is already taking place over patented versus generic medicines, particularly with reference to medicines to treat HIV and AIDS.



Global spending on ICT goods compared with the gross national product of Canada in 2003

Useful terminology

Software program

Computers receive instructions from software programs so that they can perform specific tasks. Software programs (eg Microsoft Word) act as an interface to allow a person to input information (typing a formatted letter, for example) and tell the computer what to do (save, print and/or email it). Software programs also form the tools through which the computer conducts certain operations, such as searching for particular words in a document.

Proprietary software

Most software manufacturers retain the ownership rights over their goods and do not release the source codes. This 'proprietary' software is governed by intellectual property law with the owners holding a copyright that gives them exclusive rights to publish, copy, modify and distribute the software and they usually keep the source code hidden. Most proprietary software companies sell an 'end-user licence' that lays down how people can use the software on their computers – for example, only allowing non-commercial use, or restricting the user's ability to share the software.

Free and open source software (FOSS)

FOSS allows free redistribution of software without having to pay royalties or licensing fees to the author. The source code is distributed with the software or made available for no more than the cost of distribution. FOSS allows anyone to modify the software, derive other software from it and redistribute the modified software.

Operating system

This is a huge and highly complex piece of code that controls the basic critical function of a computer. It is the platform or the foundation upon which software applications – word processors, spread sheets, databases, etc – sit and run.

Source code

The collection of files in a computer program that can be converted from text form to an equivalent form executable by a computer.

The case for open source software

FOSS is an attempt to minimise communication costs, and maximise local potentials and creative capacities

The potential for a conflict to arise between proprietary software and open source software was highlighted in 2003, when the President of India, Abdul Kalam, in an informal discussion with Bill Gates, Chairman of Microsoft Corporation, the world leader in software, pitched for open source software codes. Kalam later said: 'Our discussion became difficult since our views were different,' referring to the reservations that Microsoft had at that time to 'non-proprietary' software. This exchange should be seen in the context of the Indian government's IT (information technology) spending, which is predicted to grow from US$1.4 billion in 2005 to US$2.9 billion in 2009 with a growth rate of 19.6 per cent – the highest in Asia, surpassing China.

FOSS can save billions of dollars which can be used for other purposes

Bildad Kagai, Chief Executive Officer of a Kenyan open source company and coordinator of the Free Software and Open Source Foundation for Africa (FOSSFA), says 'Africa is poor but there is a huge ICT industry, mainly dependent on the government sector (about 70 per cent)'. The challenge and irony, he notes, is that billions of dollars are transferred to the US and Europe to procure solutions which can be produced locally.

FOSS developers and supporters have social, economic and political motivations, rather than purely commercial ones. It is fundamentally rooted in principles of sharing and, hence, promotes the flow of communication and knowledge

The African Virtual Open Initiative Research (AVOIR) is bringing together nine universities to build the capacity to design, develop and support free and open source software. AVOIR aims to connect Africans with Africans and the world, enable the skills and knowledge that exist within the continent to come together via the internet, and create more business and development opportunities. It is easier for developing countries to plan and execute such initiatives through open source software, rather than by purchasing licensed software.

FOSS can be viewed as a public good created by citizens contributing their work in an open and collaborative fashion. As a public good, FOSS can promote local ICT capacity development and save tax payers money spent on licensed software purchases

Experts have demonstrated that sharing software programs with the public can promote local capacity, creativity, localisation and independence from profit makers, while reducing costs. For example, the Chinese Ministry of Education, in partnership with the hardware multinational IBM, has begun using a China Education and Research Grid to connect 200,000 students in 100 universities.

FOSS is an alternative to using illegal pirated software

As many countries – in particular in the South – begin to conform to the World Trade Organization's (WTO) rules on intellectual property rights, there is increasing pressure not to use pirated proprietary software, and large corporations are starting to demand enforcement of software licences. FOSS offers an affordable – and legal – alternative to those who cannot afford expensive software and/or do not want to use pirated software.

FOSS is better than proprietary software at promoting local language content

The main language of today's computers is English, and the Roman alphabet is widely used. More participation by non-English speakers or those who are not familiar with the Roman alphabet is possible only when their languages are used in software. Known as software localisation, this process helps to publish online documents and content in local languages. Because proprietary software is generally closed, it cannot be changed into local languages. In addition, if a software company finds that there isn't enough money to be made in a market dominated by a specific language group the chances are it will shy away from developing software in that language.

Free and open source software enables more people to have access to information that they can control and adapt to suit their needs. This facility is increasingly crucial for sharing in the benefits of economic development.
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The case for proprietary software

Free software may not always be free

Open source code can be – and is – the basis for products such as RedHat and dozens of other commercial distributions of Linux, one of the biggest FOSS application providers. These range in cost from a few US dollars to a few thousand US dollars. Some Linux applications are sold at near US$2,500 and prices can go up to US$18,000.

Let the market decide

Robert Kramer, Vice President of Global Public Policy of the Computing Technology Association (ComPTIA) says: 'Our principal position is that governments need not undertake to pass legislation or enact rules that limit their choices to one or the other. In fact, the idea of having a rich set of choices in software that adds both the opportunity of open source and those in the commercial software area is really the way to go. If open source is already competitive, then you don't need to have government procurement policies that are targeted towards open source or for that matter targeted towards any particular kind of software.'

Open source software isn't all about altruism

The mainstream media and FOSS enthusiasts often portray the open source community as altruistic – people who are not driven by the profit motive. In reality, many 'beneficiaries' of this movement – apart from the developers themselves – are major corporations that use Linux software.

Is FOSS always the cheapest option?

Open source software may not always be the cheapest option just because it is free to share – but it does include training and maintenance. In the long run, open source can offer additional advantages, such as skills building and a higher degree of adaptability to local environments.

Software developers are extremely influential players in the proprietary software:open source software debate.
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Commercial companies are responding to the challenge of FOSS

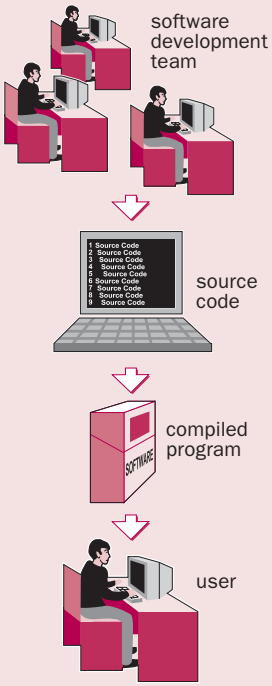
In 2001, responding to the open source movement, Microsoft Corporation announced its Shared Source Initiative, a programme to share the Windows source code with governments, companies and educational institutions. In January 2003, Microsoft announced a Government Security Programme (GSP), which allows government and international organisations to assess the security and integrity of Microsoft software. The corporation's shared source efforts do not allow users to modify the code or turn into derivative Windows programs themselves.

Issues	Questions for journalists to ask
Communications costs	■ **How much does your country spend on ICT goods, proprietary software and other IT applications, including renewing licences? Can these costs be redirected to pro-poor development programmes?**
Access to knowledge	■ **What is your government and civil society doing to increase the flow of knowledge through the use of ICTs?**
Control over software and access to intellectual property	■ **Who has access to the source codes for software applications of government and other IT systems in your country, particularly where public or sensitive data are stored?**
The language of electronic communication	■ **How can the use of local languages in ICTs be promoted in your country? What are the obstacles? What would be the effect of developing software programs in local languages?**
Right to information	■ **Is the political climate of your country favourable to information access? Access to the internet cannot happen in countries where the right to information is difficult.**

Ways of developing software

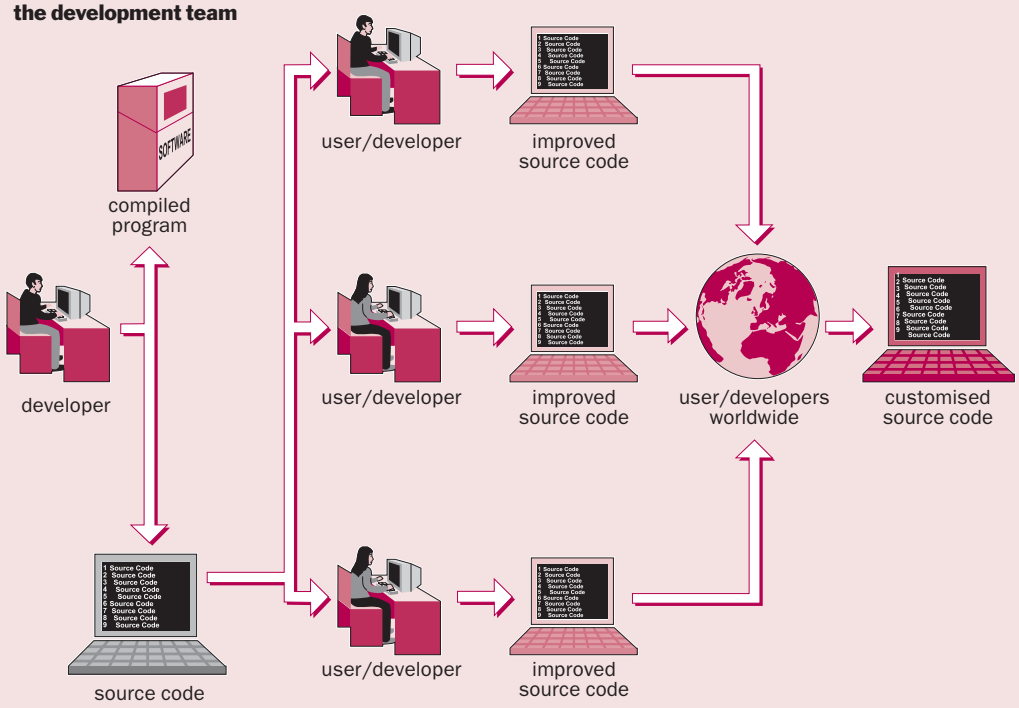
The cathedral model

Modification of software can only be done by the development team



The bazaar model

Software can be customised by users as well as the development team



FOSS and proprietary – where they meet

Sometimes proprietary software is marketed as 'shareware', where it is offered free of charge for an initial trial period, after which the user must purchase a licence to continue to use the software.

Proprietary software is also sometimes released as 'freeware', where it is made available for use free of charge. However, the source code is not provided and the licence restricts copying, modification and resale.

Software companies are involved in providing support services for FOSS products.

Many successful software companies use Linux: it can be found in Macs, PCs, palmtops and even the latest Sony game system, Playstation 3.

Commercial companies make profits out of free software

Commercial companies make profits by distributing free and open source software. They make money by selling services and support for free software.

Use of FOSS in the private sector is increasing. Royal Dutch Shell worked with IBM to build a Linux-based supercomputer linking 1,024 servers to analyse seismic data and other geophysical information as part of its efforts to find new oil reserves. Similarly Industrial Light and Magic (a leading post-production visual effects company in the entertainment industry) converted its workstations to Linux.

Can FOSS really work in the marketplace?

The two companies that have attracted the most attention, primarily because of their technical sophistication and success in providing operating systems, are Apache and Linux. Apache dominates its market: more than 61.44 per cent of web servers ran Apache as of November 2006 and it continues to grow relative to proprietary alternatives.

Linux has also emerged as a robust and stable operating system, used by about 20 million people worldwide, with an annual growth rate in the number of users of nearly 200 per cent.

Such projects have demonstrated that a large and complex system of code can be built, maintained, developed and extended in a non-proprietary setting where many developers work in a parallel, relatively unstructured way and without direct monetary compensation.

Above all, FOSS has successfully pressured commercial companies to open and share their source codes with select clients.

Other popular open source software include OpenOffice.org (comparable to Microsoft Office software), the GNU Image Manipulation Program (comparable to Photoshop), Mozilla Firefox (a popular web browser) and Mozilla Thunderbird (an email program).

Challenges for FOSS

- Some support services have to be paid for
- Participation in global FOSS development and access to FOSS applications require strong internet connectivity, which can be erratic in many countries. Internet connectivity is one of the key enablers of the FOSS movement. It allows programmers from around the world to write software together. Real-time connectivity is the important delivery channel for FOSS applications. In fact, most FOSS applications cannot be purchased in stores but must be downloaded in electronic form
- Many African and other developing countries do not yet have large numbers of software developers yet to modify, adapt and support FOSS applications
- Current technical support staff (who, in most cases do not require software development skills) are more familiar with proprietary software applications. As demand grows the supply of human capacity will adjust, but shortages and the high rates charged by experts could become a problem during a transition phase of growing FOSS use
- Similarly, the majority of software and software service industries (delivering support, training, etc) in developing countries have traditionally focused on proprietary software. This imbalance will need to be addressed
- While FOSS is a success story in server applications technology, desktop computing remains a challenge. Greater diversity of applications and user expectations have limited the reach of desktop computing software
- Resistance to learn and use new software programs is common in all ICT and technology projects. Ironically, many civil society organisations which consider FOSS a good thing do not use it themselves.

While free and open source software may seem to be the way forward for developing countries, there are still many challenges to overcome before successful implementation can be guaranteed.
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Useful websites for further information

Journalistic resources

www.salon.com/tech/special/opensource/index.html – Complete archive of stories published on free and open source software by Salon.com

www.microsoft.com/windowsserver2003/upgrading/compete/default.mspx – Windows making the case against open source cost

http://en.wikipedia.org/wiki/FOSS – Wiki on open source software

www.wired.com/wired/archive/11.11/opensource.html – Old but useful journalistic piece

www.panos.org.uk/iwitnesses – Panos blog on information society story ideas for journalists

www.panos.org.uk/iwitness/toolkit – Previous Panos media briefings on ICTs

Websites of free software developers

www.gnu.org/philosophy/free-sw.html

www.openoffice.org

www.linux.org

www.redhat.com

Civil society resources

www.apc.org/english/news/os_index.shtml – News on free software by Association for Progressive Communications

www.cipesa.org/153 – Policy brief on free and open source software by Collaboration for International ICT Policy for East and Southern Africa

Governmental and development agency resources

www.fossfa.net/fossfa – The Free Software and Open Source Foundation for Africa web portal

www.soros.org – Donor champion for open source software

www.iosn.net – UN supported Centre of Excellence for Open source software

Research resources

http://libresoft.urjc.es/index – Quantitative measurement of libre software

http://flossworld.org – Aims to strengthen Europe's leadership in research into FLOSS and open standards

www.isr.uci.edu/research-open-source.html – University of California, Irvine, focuses on empirically-based studies of the processes, practices, and communities that develop open source software

http://floss.syr.edu/ – Syracuse University – researching effective work practices for free and open source software development

http://opensource.mit.edu – Massachusetts Institute of Technology – an attempt to establish a community in which information is freely exchanged, in order to understand open source and its implications outside the realm of software development

Panos is a worldwide network of independent NGOs working with the media to stimulate debate on global development issues.

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Panos Media Toolkit on ICTs

1 **Who rules the internet? Understanding ICANN**
2 **Why calls in Africa cost more: the need for VSATs**
3 **Dollar divide, digital divide: funding the ICT revolution**
4 **Going the last mile: what's stopping a wireless revolution?**
5 **Giving away secrets: can open source convert the software world?**