INTERNATIONAL INSTITUTE FOR COMMUNICATION AND DEVELOPMENT

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IICD Research Brief – No 7, August 2003

Open Source in Africa: Towards Informed Decision-Making

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The subject of open source software generates lively debate in ICT circles, not only in relation to proprietary software, but also with respect to its potential application in the South. Setting aside the often-raised ideological issues, the real question for decision-makers is whether open source is appropriate for their organisation. This Brief summarises research carried out in Tanzania, Uganda and Burkina Faso and other countries, asking where, how, and why open source software is being used in Africa. Researcher Martin Bruggink highlights the opportunities as well as the risks facing IT managers in African institutions who are thinking of making the switch to open source.

What is open source software?

Open Source Software/Free Software[1] (OSS/FS) refers to any software which may be copied and used freely. The software is often available free of charge on the Internet, so it can be acquired for the cost of the time it takes to download. Unlike proprietary software, open source software can be copied, used, studied, modified, distributed, etc., with few or no copyright restrictions.

A chance to innovate. Open source gives young people a chance to explore and create software from the inside out.

Like the generic drugs that have transformed health care provision in the South, open source software is royalty and license free, and is therefore substantially cheaper to acquire than branded alternatives. The reason for this is that open source software is developed by volunteer collectives who are not seeking to profit from its sale.

In addition, just as the recipe for generic drugs is made public, so the source code or inner workings of open source software is accessible to the user. Any qualified person can see exactly how the software works and can easily make changes to the functionality.

Gaining momentum

Open source software is more than just the well-known Linux operating system. It is particularly popular in operating systems and server software, though desktop applications such as email clients and word processors are gaining momentum among computer users.

It is worth noting that some open source products like Linux and Apache are global market leaders, and that major ICT companies like IBM, Sun and Oracle have adopted the open source model. Clearly, open source can and does compete with proprietary software.

Advantages and risks for organisations

The decision to choose open source must take into consideration the organisation's needs, capacities, and the external environment. As with any technology choice, there are both advantages and risks that IT decision-makers in African organisations need to consider in order to make a well-founded decision.

[1] *There are many variations in the terminology used to refer to this type of software (FLOSS, OSS/FS, Free Software, etc). For the sake of simplicity it is referred to as "open source software" throughout this paper. A complete definition of terms can be found here: www.wikipedia.org/wiki/Free_software*

Advantages:

- The software can be obtained at low or no cost; no royalties or license fees apply.
- The organisation avoids "vendor lock-in," meaning that it is not dependent on a single software provider.
- Open source code can be adapted to meet local needs (e.g. may be adapted into local languages).
- Since the source code is accessible and the software is usually based on public standards, technically inclined users can see how the software works, and develop transferable ICT skills.
- The global open source community provides opportunities for South-North and South-South collaboration and knowledge sharing.

Disadvantages:

- There are fewer trained people available to provide technical support. This is due to the fact that most ICT training programmes are preparing students to work with the most commonly used proprietary software packages, such as Microsoft.
- Making a large scale switch from one type of software to another can be complex and costly for the organisation, especially if there is a lack of practical experience, information and support available.
- Some proprietary software isn't compatible with open source. Sharing files with outside organisations can be more difficult for the individual user.

The new web portal of the Government of Ghana was developed using open source tools.

Research findings

In early 2003, research teams in Uganda, Tanzania and Burkina Faso investigated the use of open source software in their countries. Their objective was to find out how, where and why organisations from various sectors use open source software, what problems can be observed, and what opportunities are available. Over one hundred people participated in the research.

Obstacles to open source adoption

Open source software is not widely used in the countries surveyed compared with either licensed or pirated/black market proprietary software. The use of open source is often confined to "back office" applications, such as email and web servers, although open source content management systems are increasingly widely used. The research identified a number of systemic obstacles to the widespread adoption of open source in African organisations.

One obstacle is availability. There are few resellers of open source software in Africa, and although it may be available on the Internet, unreliable connections and the high cost of the Internet in developing countries makes it difficult and expensive to download software from the Internet.
Another problem already mentioned is the lack of technical support, especially by certified support personnel. Few certification programmes exist for computer and network support professionals specialising in open source software.

Information on migrating from proprietary to open source systems is hard to find, pointing to the need for decision-making tools specifically geared to the needs of African organisations. The researchers have proposed a decision model that may help alleviate this problem.

Another finding relates to organisational culture. Particularly in Burkina Faso, it was noted that large, hierarchal organisations are more hesitant to use open source software due to a risk-averse organisational culture.

Finally, researchers found that there is a widespread perception that Linux operating system is the only real open source application, and that this type of software is less user-friendly than proprietary alternatives.

The latter finding points to a need to provide strategic and technical information geared to the

needs of IT decision-makers in African organisations. The research identified as priorities: informing people of the full range of open source software options and increasing access to the software; getting the message across that Linux and open source software in general is increasingly user-friendly and easy to install; and supporting decision-makers with decision models, toolkits and case studies relating to choice of technology and system migration in an African context.

A changing policy environment

A highly significant development in recent years has been that national and local governments including those of the UK and South Africa have recognised opportunities which open source can offer, not only as a way of saving money, but also as a stimulus to an autonomous domestic ICT sector and the development of a local ICT skills base. Key to official strategies in support of open source are government procurement policies that favour open source software for government services such as schools, hospitals, public works, etc.

In the case of South Africa, the government approved an open source strategy for the public sector, including a commitment to implement open source software where analysis shows it to be the appropriate option. When proprietary and open source options are equal, open source will be given preference due to “the improved returns on investment associated with the elimination of licensing” and the “end of maintenance agreements that lock government into expensive long-term contracts," according to a statement by the Minister of Public Works.

The South African strategy acknowledges the need to create knowledge, understanding and capacity in order to realise the full potential of open source to deliver savings in the public sector as well as downstream social and economic benefits for the country.

International support

Civil society organisations and the open source user community worldwide have been instrumental in bringing about these policy shifts. Through research, regional conferences, public consultations, and by disseminating open source software on CD-ROM and on their websites, organisations such as the Association for Progressive Communications (APC) and the recently formed Free and Open Source Software Foundation for Africa (FOSSFA), as well as IICD, AITEC, Bridges.org, Bellanet, OASIS Trust, SchoolNet Africa, Hivos, UNESCO and others contribute to raising awareness of the policy issues and practical implications of open source.

In addition, Open source and Linux user groups meet face-to-face and online in a number of African countries, and form a strong network of practitioners and advocates for open source. These initiatives have done much to raise public awareness and to help organisations make fully informed decisions.

Total cost of ownership

Organisations considering open source must determine the true costs involved in choosing and living in an open source software environment. In spite of the fact that it is often free, the question of whether open source is actually cheaper than proprietary software cannot be answered unequivocally. Total Cost of Ownership (TCO) refers to both direct and indirect costs related to the use of an ICT component such as network infrastructure. The calculation of total cost must include license fees (if any), and also expenditures for support and training of personnel. It must be calculated over the entire lifespan of the project.

Ugandan university migrates to open source

Uganda Martyrs University (UMU) has approximately 2000 students. A local area network has been established allowing students and staff to connect to the Internet.

Currently, UMU has a back office running on open source software (Linux operating system, web server, email server). ICT administrators have become quite confident in dealing with open source software. In the summer of 2003, the university plans to migrate the entire network to open source software. Desktop computers will be equipped with the Linux operating system and open source browser, email client, word processor, etc.

Cost reduction is the main reason the university decided to migrate to open source. Since Microsoft is changing its license policies, the cost of licenses is expected to soar. Furthermore, the university wants to build its capacity in open source software skills. This initiative puts UMU in a uniquely competitive position in the country.

It was found that students are generally more willing to adapt to a new software environment than staff members, some of whom are reluctant to learn a new set of computer skills.

Because of the lack of qualified personnel, the cost of technical support can be greater for open source than it is for the more common proprietary software. However, the high price of imported proprietary

software can outweigh support costs in a developing country setting. This is just one example of how TCO calculations differ widely in different parts of the world. Advice based on Northern case studies and examples will not stand up in the light of an African reality. Intangible considerations should also be assessed. For example, the successful implementation of open source depends to a large degree on management buy-in and support over the long term.

Whether or not the TCO for open source software is lower or higher than proprietary software depends greatly on the context. In the full report on this research, two decision models illustrate which factors might play a role in decisions on software infrastructure and possible migration to open source software.

Conclusion

It is worthwhile for managers in African organisations to consider open source alternatives when weighing options relating to ICT infrastructure. The decision should be based on a thorough understanding of the options available, the surrounding policy context and local capacity to support and sustain whatever software platform is selected.

Awareness raising, research, case studies and decision tools will help organisations to make informed decisions, and regional and international initiatives including the upcoming World Summit on the Information Society are helping develop broader understanding of the issues and the stakes for both organisations and societies as a whole.

More information

The complete report *Open Source Software: Take it or leave it?* is available on the IICD website: www.iicd.org and also in print. The printed report includes a free CD demonstrating several open source applications, which may be viewed without installing anything on your computer. Copies may be obtained by contacting research@iicd.org or by writing to us at the address below.

Web links:

- Free and Open Source Software Foundation Africa www.fossfa.org
- Tectonic – Open source news from Africa www.tectonic.co.za
- FSF/UNESCO Free Software Directory www.gnu.org/directory
- Openoffice.Org – Free office suite including word processor, spreadsheet, etc. www.openoffice.org
- Open source on ItrainOnline www.itrainonline.org
- Bridges.org www.bridges.org
- Linux User Groups www.linux.org/groups
- Center of Open Source and Government www.egovos.org

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