

Open Source

A DIGITAL MERAKA

The Council for Scientific and Industrial Research's (CSIR) *icomtek* business unit has compared Open Source Software (OSS) to 'meraka', a Sotho word meaning common grazing land. It's a perfect comparison – like meraka, OSS can be used by anyone, privately or communally, as long as the land/software itself is retained for the common good. Like so many great ideas that involve some degree of sharing, if people can't instantly see what's in it for them, uptake is often slow and detractors legion. A further inevitability: as night follows day, human nature dictates that one individual or small grouping will eventually decide that they want to own the whole field and rent it out to everyone else. In perpetuity. Sound familiar?

In our wild wired world, we have become accustomed to instant gratification, having knowledge at our fingertips and being able to do just about anything we want with a few clicks of a button. It's a fact of human existence that our wants seem to increase in direct proportion to the amount we already have. The past decade has seen technology develop at a screaming pace; the possibilities are endless and the notion that anything could be impossible is dwindling – to a disproportionately small portion of the world's population, at least.

But what about the rest of the planet, the people who don't have access to technology, and survive on extremely low incomes? What's in it for them? At the moment, not a lot, it seems. But the business of government extends well beyond the bottom line. Unlike its colleagues in the business world, government's *raison d'être* is the service of all citizens, equally. If e-Government is to be brought to every section of South African society, skills and capacity increased, and employment and innovation nurtured, technology has to be available to everyone, not just those who can afford it.

OSS represents the ideal carrier for the ideals and goals of government; the very principles on which it stands – open access for all, the sharing of benefits without inhibiting enterprising vision – sit easily alongside the *Batho Pele* philosophy.

▶ IT'S FREE... AS IN FREEDOM

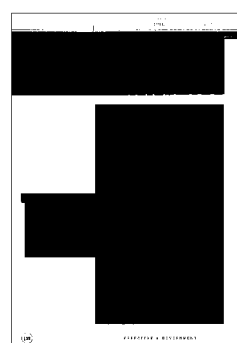
Open Source Software (or Free/Libre Open Source Software – FLOSS – to be precise) refers to any software that is developed and tested collaboratively and distributed freely to anyone who wants to use or customise it. All users are allowed to access the source code (hence the name 'open source') and are permitted to change, add, enhance or customise the software in any way they wish – as long as they too allow others to use their changes and share them with others.

There's nothing to stop developers from charging people for their work but, unlike proprietary software, those who sell their version of OSS may not refuse others the right to share or view the source code. So the software is free, as in freedom to tinker, share and distribute; not free as in "free beer" as movement founder Richard Stallman put it.

TECHNOLOGY FOR EVERYONE

In its 2003 *Using Open Source Software in the South African Government* strategy document, the Government Information Technology Officer's Council (GITOC) concluded that the role of OSS should be explicitly recognised in e-Government policy. Minister for Public Service and Administration, Geraldine Fraser-Moleketi, rowed-in behind it and encouraged all government IT employees to go forth and learn best practice methods from those already up and running with a public-service-oriented programme. Luckily for the IT officers, OSS breeds the type of developer who is more than keen to pass on his or her knowledge and collaborate on new ideas or problem-solving.

While most commentators acknowledge a continued role for proprietary offerings, with very few suggesting they be excluded, the philosophy being promoted is one



where, all things being equal, OSS solutions should be chosen. It's hard to argue against it – OSS has the capacity to change people's lives for the better on a continent crying out for equal access to everything that ICT has already brought to wealthier nations. What government wouldn't want to leverage it?

Major benefits

The major benefits accruing from OSS implementations run the gamut of social, technological and economic desirable outcomes, including:

- **Reduction of costs:** OSS software generally has a lower total cost of ownership. Implementations can help developing countries reduce their dependency on imported technologies and skills and develop the confidence to look to their own people to provide these. Why pay out licensing fees in dollars when you can help educate, create employment and develop at home?
- **Affordability:** Whether it's the government or an ordinary citizen, the benefit of paying less (or nothing at all) for high-quality software requires little explanation.
- **Universal access:** Because it's cheaper, you can roll it further. No costly licensing fees means more people can use it.
No barriers: Without the restrictions that can come with proprietary software and data formats, access to government information, both G2G and for citizens and businesses alike, is enhanced significantly.
- **Tailor-made and customisable:** This is one of the greatest benefits of OSS. In-house developers can tweak software to meet individual requirements. A social benefit is the ability to customise software to meet local language requirements – something that proprietary developers are often unwilling to do, particularly where it's not seen to be profitable. This is invaluable in a country with 11 official languages and a large digital divide.
- **Enabling local business:** OSS solutions are generally more affordable for smaller enterprises and, in a classic win-win situation, increased take-up in itself feeds the development of new businesses to assist with support or software development.
- **Security:** Open Source (OS) operating systems and software solutions are generally less susceptible to attack than proprietary. Fact.
- **Building networks, growing brains:** The collaborative nature of OSS development encourages those involved to build extensive international networks with like-minded people, all looking to share knowledge and expertise.

DIGITISING DEMOCRACY

OSS is all about pooling knowledge and collaborating for the good of everyone. It restores the concept of knowledge and information as shared, public resources and imposes few barriers to accessibility or participation. In a nutshell, it's democracy gone digital. The massive potential offered by OSS in terms of delivering G2G and G2C obligations effectively has been recognised by most governments. Both are key elements of government service delivery that rely to a large extent on collaboration, co-operation, information pooling and, as the bedrock of all this, *interoperable platforms and architecture*.

Yes, proprietary software (PS) can (and does) work well in this environment, but there's no escaping the interoperability issues they raise – if each agency and department utilises a different PS solution for

▶ OPEN SOURCE OF THE HIGHEST CALIBRE

South Africa isn't on its own when it comes to recognition of the role OSS can play in giving business and government a competitive edge. The European Union's CALIBRE (Co-ordination Action for Libre Software) project has the goals of establishing an OSS research policy forum for industry, fostering the effective transfer of OS best practice to European industry and the integration of the best of research and practice across business and government.

University College Cork in Ireland is heading up an international team to produce the CALIBRE Dissemination and Awareness work package, which will offer indepth research into OS business models.

CALIBRE also examines hybrid models and best practices to enable innovative reorganisation of both SMEs and large institutions, with the aim of constructing a comprehensive research roadmap to guide future open source software research.

www.calibre.ie
www.ucc.ie

▶ SUPPORTING OPEN SOURCE

"Open Source Software (OSS) is an important issue for the Department of Science and Technology. The National Research and Development Strategy emphasises the need for increased levels of local research and innovation, particularly in the ICT sphere. The South African ICT industry has, to date, been largely focused on re-selling imported technology instead of focusing on the development of innovative local solutions to address uniquely South African needs.

"We believe that OSS can make a real contribution to change the *status quo*. Through access to source codes, local entrepreneurs can build on the existing world best technologically sound software tools and platforms. This will enable us to leapfrog to the front of the ICT revolution, and to create IT products comparable to the best the world has to offer."

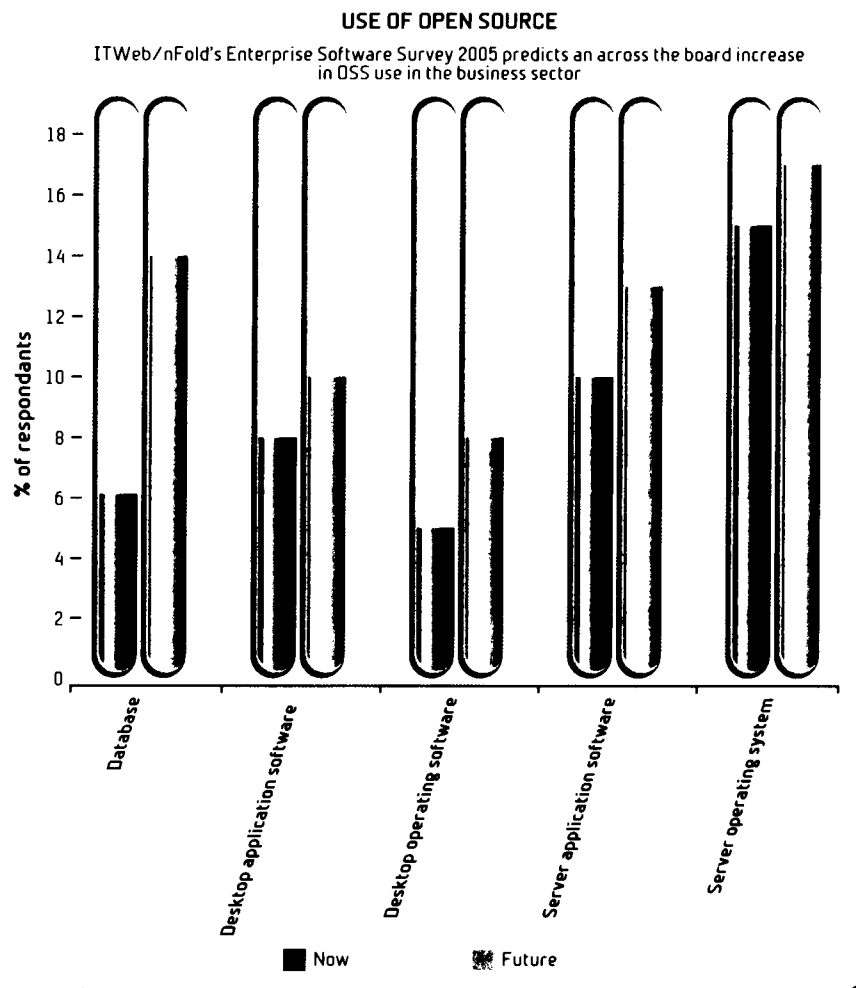
– Minister of Science and Technology, Mosibudi Mangena

everything from databasing to word processing, you're unlikely to end up with an environment conducive to the seamless transfer of information.

What you *are* sure to get is a mountain of licensing fee demands, not to mention the accompanying paperwork, as SITA's recent run-in with the Business Software Alliance illustrates (however happy the outcome turns out to be). SITA CIO Vusi Magagula had initially come out strongly in favour of an OS model, but is caught in a bind due to the not-insignificant penalties the organisation will have to pay for licensing transgressions should they fail to settle with proprietary vendors. While he is seeking the support of proprietary developers in revealing source code and allowing an OSS-style access to it, it remains to be seen whether this unlikely scenario will come into being. Perhaps in advance of this, tenders are already under consideration for the procurement of an OS and related software support services provider (for both operating systems and applications).

Digital self-sufficiency

With the above in mind, consensus across the myriad of academic presentations and papers, reports and opinion on the topic seems to be that the most compelling reason for any government to embrace OSS is the self-sufficiency and control that it brings.



The South African government is a huge buyer of software, and if it could reduce those costs by a half, or even a third, the savings would be in the hundreds of millions of rands (an estimated \$8 billion per year leaves this country in offshore license revenue, while SITA's Magagula estimates that the government spends R2 billion on licenses). This is money that could be put to work elsewhere – especially if there's a less expensive, equally good alternative on offer.

And it's not about some misplaced crusade against foreign software developers; aside from government's repeated assurances that proprietary software is not to be rejected out of hand, the concerns regarding cost are very real. The nFold/ITWeb Enterprise Software Survey 2005 highlighted growing private sector concerns regarding enterprise software costs, inflexible licensing arrangements and the seemingly endless need to upgrade. Small wonder that 40% of those surveyed were already using OSS, mostly on the server operating system and applications side. But a further 62% plan to introduce OSS to the operating system, desktop and database arena soon.

Home grown is organic

If government can access and alter the source code for its operating systems and applications, it gains better control over state IT systems. In a vendor-dependency situation, the state more or less cedes control to a trusted provider when it comes to protecting all manner of valuable information. On the other hand, there's the option of developing and controlling a tailor-made solution that remains the intellectual property of the state. The sort of custom-built application that can be adapted to meet changing needs or extended to work across other systems – no need to worry about future requirements when you're in control of the code and the upgrading.

Initial outlays for development and cost can be readily offset against savings on licensing and the benefits accruing from increasing home-grown skills, fostering indigenous software development and supporting new local enterprises. Hardware life can be prolonged through paring back software to dispense with the bells and whistles you pay for but really don't need, speeding up older systems. Cutting back on bandwidth hogs in the form of bloated updates, delivered online will also reduce costs. Custom-built, in-house-supported software helps steer away from the seemingly constant need to upgrade hardware to support software that needs to be upgraded to support hardware that needs to... you get the idea.

Spending taxpayers' money wisely

Under the terms of the Public Finance Management Act, government is obliged to spend taxpayers' money in the best possible way, delivering value for money services. Much of the time, OSS not only costs less but government implementation will encourage young and aspiring developers to get involved because they'll see a future in pursuing IT careers and skills.

At national level, the departments of Communications, Public Enterprise and Trade and Industry are among those experimenting with or adopting OSS. SARS is a state body running its SAP implementation on Linux boxes, while the City of Cape Town, faced with obsolete hardware and a maintenance contract that was well past its sell-by date, moved its back-end Oracle infrastructure over to SuSE Linux and is very pleased with the results indeed – saving up to R200 000 on annual maintenance contracts alone.

KEEPING THE FUTURE OPEN

The National Advisory Council on Innovation's (NACI) *Open Source Working Group* document has pointed to the importance of OSS in maintaining an always-accessible archive of digital files, such as birth certificates, tax returns, DNA databases etc. Such files are of vital importance to the state and, as such, must be accessible in perpetuity.

The most recent version of the Working Group's document points out that, "As these digital records are likely to continue to expand further through the promotion of e-Government there is a strong incentive for the public sector to avoid lock-in to proprietary formats to store this data." The report also points to the importance of freely available formats for document exchange such as HTML and PDF in realising the vision of joined-up, G2G government – indeed, it is a fundamental recommendation of the Group's document.

www.naci.org.za/floss

▶ NURTURING TALENT

The CSIR's Open Source Centre has been tasked with creating and enabling the conditions required for open source software to nurture home-grown ICT talent, innovation and development. The centre is focused on offering opportunities for individuals to innovate, learn and develop as well as creating new channels for education. At the heart of this will be the provision and encouragement of new business development opportunities. No surprise, then, that the Open Source Centre has an office at HP's i-Community in Mogalakwena, tasked with growing local SME initiatives and getting involved in education and innovation.

www.csir.co.za

Open for innovation

The collaborative nature of OSS development combines beautifully with the freedom to tinker, offering aspiring code writers a blank cheque to try things out and actively encouraging innovation. Because all changes and improvements are shared back into the community, developers are free to innovate and improve on previous ideas. This represents a marked improvement on the proprietary scenario, in which developers are limited to becoming proficient at *using* software – no bad thing in itself, but for a young democracy looking to develop African solutions to African needs, there's no denying the desirability of skilling-up our home-grown talent.

It's not the stuff of idealism, either; South Africa's first Internet billionaire and space tourist, Mark Shuttleworth, used OSS when building up his Thawte digital certification and security company.

Shuttleworth's recognition of the valuable role played by OSS in innovation, social upliftment and education is reflected in his sponsorship of campaigns such as the Go Open Source campaign, his involvement in the development of Ubuntu Linux and recent purchase of a 65% stake in ImpiLinux, South Africa's first 100% home-grown Linux distro.

Mouth-watering prospects for skills development

The prospect for skills development and enhanced capacity are mouth-watering. The concept of African developers all over the continent collaborating on initiatives

to facilitate trade, development and education is almost irresistibly attractive. A scenario that allows almost unlimited sharing of resources is the perfect nursery in which to grow these ideals. The fact that many OSS applications and operating systems can be pared back to the bare minimum, allowing them to run on cheap legacy systems constitutes a unique opportunity to bring technology into even the poorest, most remote areas.

Education, entrepreneurial opportunities and all manner of social initiatives are made affordable by OSS. Too bad that South Africa's still exorbitantly-high cost of getting online continues to serve as a wing-clipper. The only real limiting factor in the world of free/open source software is zero bandwidth. Hopefully, now that the licensing of the Second National Operator has become a reality, a little competition will see a radical improvement in this situation.

Sharing the wealth

If we are to achieve the vision of a society where knowledge is used and shared to address issues such as poverty, development and equality, the role of proprietary technology as a barrier to this has to be acknowledged. Government's recognition of the important role OSS could play in promoting economic, educational and social development is evident in the setting up of centres such as the CSIR's Open Source Centre and Meraka Institute (for advanced development of ICT), officially launched in mid 2005 among a slew of initiatives, not least the President's request for the setting up of a Free/Libre Open Source Software (FLOSS) taskforce to transform the government's strategy document into effective policy.

Many partnerships have been established, perhaps the best-known being Hewlett-Packard's Emerging Market Solutions division joining with the Limpopo Government to bring ICT to the poverty-stricken, rural Mogalakwena municipality. Launched by President Mbeki and then-HP President Carly Fiorina as part of the 2002 World Summit on Sustainable Development, the i-Community project has, over three years, helped over 4 000 people learn PC skills and promoted 25 small businesses. All using OS solutions, backed by the CSIR's Open Source Centre, which has an office there. The i-Community is geared towards social upliftment, fostering innovation and education people, all in a locally-relevant way.

The joint Department of Science and Technology/CSIR Digital Doorway project has, meanwhile, brought multimedia kiosks to remote and disadvantaged areas with a view to promoting access to information and expanding skills. Each terminal runs a GNU/Linux distro with the KDE interface, for which language modules have been added for isiZulu, isiXhosa, tshiVenda, Setswana, and Afrikaans. All other software is Free/Open Source, allowing users to experiment and learn about code without formal training.

IS THE FUTURE OPEN?

There is no denying the growth of OSS, particularly in the back-end market, where it has all but taken over the server sector. The move to the desktop – for many, the real yardstick of how well OSS is advancing – continues to be slow. Although recent high-profile successes of applications like the Mozilla Foundation's Firefox browser

▶ TRANSLATING INTO EQUAL ACCESS

In a country with 11 official languages, providing citizens with the best that ICT has to offer is a challenge. Dominant proprietary systems and applications are largely available in English, which is of little use to a Xhosa or Zulu speaker. Exclusion from technology based purely on language skills is a sorry fact of life for many of the world's people, and the seeming reluctance of many of the major developers to offer African languages isn't remedied by their equal reluctance to allow someone else access to the source code to do it for them, free of charge.

Which is where local group Translate.org stepped in and put the big boys to shame. Using the open source KDE desktop environment, the NGO took a mere three months to translate a range of applications into Xhosa, including the KDE desktop itself. Open Office's suite of word processing/spreadsheet/office functionality applications is available in all eleven languages thanks to the work of translate.org, which is helped in its work by sponsorship from the Shuttleworth Foundation and Department of Communications, among others.

www.translate.org.za

▶ OPEN DOOR FOR PORTABLE KNOWLEDGE

A portable knowledge asset development system, pKADS, was officially launched at the 2003 World Summit of the Information Society in Geneva. An OS desktop application written in Java, it can be used to create 'knowledge assets' that, among other things, can present information in a question-and-answer format, organised into categories, contain distilled, experiential knowledge on a specific subject or process; enable a community of 'asset network members' to collaborate in the development and maintenance of any asset, and help readers find related resources in the form of examples, case studies or further documentation.

pKADS can combine with relevant workflows and organisational commitment to further the implementation of effective knowledge sharing practices key to effective e-government. The team at University College Cork, Ireland, has taken this a step further and is working with the Irish government to develop eGOV-KP, an OS Java enterprise application. The pKADS application is available on CD-ROM.

<http://pkads.bis.ucc.ie/>

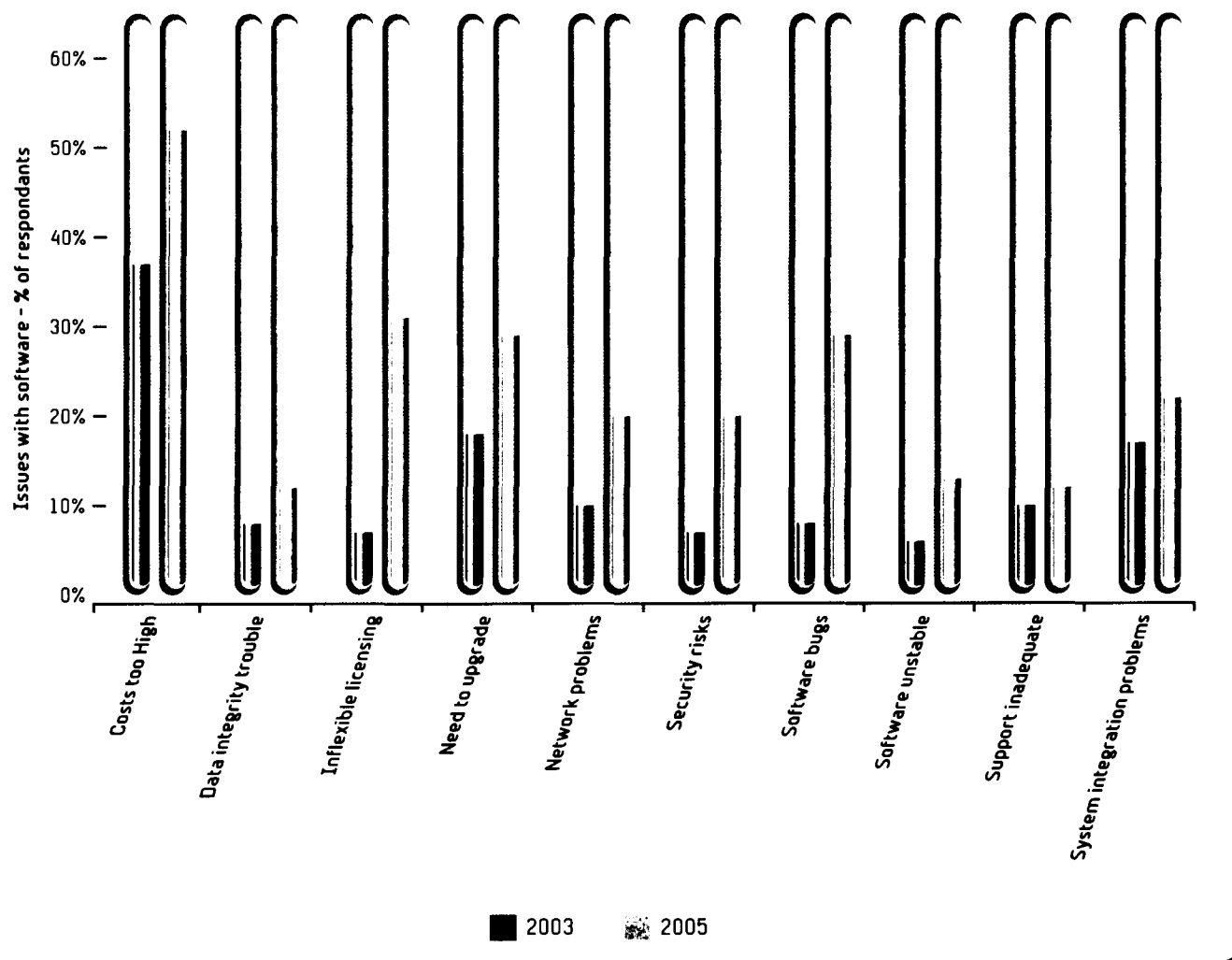
and the continued growth in functionality of Open Office will drive more users in the direction of a full-on operating system switch, as will the active encouragement of campaigns such as the Go Open Source project run by the Shuttleworth Foundation.

Equally likely to drive general uptake is the emergence of GNU/Linux distros such as Ubuntu and Impi, the latter being built from scratch in South Africa by South Africans and with a South Africa user base entirely in mind. BMI-TechKnowledge anticipates that the OSS-related services market in South African will reach R1.162 billion by 2009. It was R204 million in 2004...

But it won't be easy. And while some may feel that it's not ideal for government to be the guinea pig on the OSS front, there's no getting away from the fact that government uptake has the capacity to vigorously drive OSS growth forward.

DRIVING OPEN SOURCE SOFTWARE UPTAKE

The ITWeb/nFold Enterprise Software Survey 2005 revealed that high costs, licensing and upgrades were the main causes of business software user disgruntlement, but is it likely to drive OSS uptake?



Beyond the philosophy

Tempting as the philosophical arguments in favour of OSS adoption are, it is vital that those tasked with making decisions do so based entirely on the merits of what's on offer. This process should include factors outside of the financial considerations and look at the broader picture, including the future development of IT skills capacity. The GITOC's *Using Open Source Software in the South African Government* strategy document pointed towards this notion early on, when it divided the success factors for any open source implementation into three categories:

- Implementation should produce value
- The capacity to implement and maintain systems must be adequate
- Sufficient support for the initiative must come from all key players.

THE ROLE OF POLITICAL WILL

Software is a means to an end, its value lying in how many of government's goals it will achieve, economically as well as socially. If the South African government is to follow-up on its commitment to OSS, it is important that it continues to do so in partnership with the private sector, underscoring the principle that there are both customers and a support base out there. Equally important is the support and encouragement of tertiary education institutions, whose role in ensuring the production of certified, skilled developers and support workers forms a vital component of a flourishing OSS base. Key to this important aspect will be the provision of affordable training for students.

Few would advocate a 'big bang' approach, with most pointing to the merits of a gradual easing-in to using OSS. Even letting go of the heartfelt philosophies and social conscience aspect of OSS, the range of successes OSS has had over the past decade show that it is clearly an option that survives cold, hard scrutiny. After that, everything else is a bonus. ☺