VITAL WAVE CONSULTING™

Accelerating profitable growth in emerging markets

The South African Adoption of Open Source

A White Paper created by Vital Wave Consulting

Executive Summary

This White Paper describes and analyzes efforts to expand the use of Open Source Software (OSS) in the South African market, with particular emphasis on the public sector. Drawing from research and interviews with key government and industry personnel, the paper presents the various reasons for choosing OSS, the processes of implementation, significant results, and a clear assessment of the projected and actual benefits and drawbacks of OSS in the South African context. The roles of public, private and non-profit sector organizations in successful OSS implementation will also be discussed, with concrete examples of best practices from the South African experience.

National Context

The Republic of South Africa is the African continent's premier emerging market. It has a robust and dynamic economy, the region's most developed transport, energy, banking, telecommunications and educational infrastructures, a comparatively skilled labor force, and one of the world's most progressive constitutions. With a population of 44 million, South Africa has a GDP of over $200 billion, based largely on mining, trade, transport and financial services.

Despite these strengths, the South African government faces considerable challenges, including rampant poverty, severely skewed land and property ownership, a high crime rate and a falling life expectancy due to HIV/AIDS. According to the UNDP's 2003 Human Development Report[i], over 50% of the population lives below the poverty line, and 65% do not have access to quality housing, education or healthcare. These challenges, legacies of decades of repressive colonial and minority rule, are compounded by ongoing health crises and a major influx of refugees and illegal immigrants from other parts of Africa.

Global Open Source Expansion

Open Source Software (OSS) is distinct from proprietary software in that it is developed, tested and improved through public collaboration and distributed at little or no cost. Additionally, the source code – which is normally unavailable when purchasing proprietary software – can be read or modified by an experienced programmer for customization.

Since the creation of GNU/Linux (the best known Open Source Software) in 1991, OSS has steadily gained in market share, especially in backend server systems, telecommunications and handheld devices. Currently, Linux is used on an estimated 22% of shipped and redeployed servers worldwide, while approximately 2% of new PCs will run Linux.IT market analyst IDC predicts that overall revenue for Linux-based servers, desktops, other devices will reach $35 billion in 2008 – an annual growth rate of 26%.

In recent years, improvements in Open Source desktop operating systems and applications have begun to challenge the traditional hegemony of proprietary systems such as Microsoft Windows and Office applications. Some analysts believe that OSS is pushing the software business model away from generating profits primarily through selling licenses to mixed models based on selling both licenses and services/support.

Governments and businesses are attracted to OSS for its potential cost savings, security and flexibility. Several national, provincial and municipal governments mandate the use of OSS, and many companies are turning increasingly to OSS for mission-critical functions.

To answer these challenges, the government of South Africa focuses most of its resources on improving service delivery and alleviating poverty. With over 26% of the population unemployed[ii], the government has instituted a Reconstruction and Development Program that facilitates job creation, human resource development, infrastructural improvement, and a shift toward black ownership and management in all sectors.

A lack of financial resources, human capital and rural infrastructure inhibit the government's capacity to provide social services, especially in rural areas. Administrators at all levels are encouraged to manage costs and stretch the state's $52 billion budget as far as possible. One strategy for reducing costs and fostering local empowerment is the promotion and adoption of Open Source Software (OSS).

Managing Information and Communication Technology Costs

The South African government is the nation's largest procurer of Information and Communication Technologies (ICT). Indeed, it is one of the largest ICT buyers in Africa. According to the South African State IT Agency (SITA), the government accounts for 70% of all ICT expenditures across sectors[iii], and the cost of proprietary software licenses alone totals R3.7 billion (~$580 million) annually[iv].Furthermore, the weakening of the Rand has made foreign technology imports more expensive over time.

In an effort to manage the high (and increasing) cost of ICT, the government began to openly debate the relative merits of proprietary and Open Source software in 2001. A study commissioned by the NationalAdvisory Committee on Innovation (NACI) for the Government Information Technology Officers Council (GITOC) pointed out that funds spent on proprietary software are exported out of the country, depleting vital hard currency reserves. The study concluded that the cost of running an estimated 300,000 government computers on proprietary software was unsustainable, and that the nation's continued reliance on proprietary software rendered the country dependent on foreign companies and vulnerable to currency fluctuations.[v] Based on these findings, GITOC was tasked with forming an OSS working group to articulate a policy for OSS expansion in the public sector.

OSS and National Development

While potential cost savings was the primary catalyst for the South African government to consider and develop an OSS policy, there are many perceived OSS benefits that align with national development goals.South African President Thabo Mbeki has articulated five pillars in the national development framework:

- Increased competitiveness
- More local and foreign investment
- Improved access to and participation in economic advancement
- Greater contribution to regional and international development
- Increased capacity to deliver education, health, housing and other government services

Increasing competitiveness in the global marketplace will require a concerted effort by the public and private sectors to raise skill levels and keep costs low. One of South Africa's most successful software developers, Mark Shuttleworth, claims that the country can best compete by exploiting the low cost and flexibility of OSS to improve science, technology, math and entrepreneurial skills. Tellingly, Shuttleworth sold his Internet security/e-commerce business to VeriSign in 1999 and is now one of the fiercest and most influential proponents of OSS in South Africa.

Because OSS encourages and allows for more local software development and support, it furthers President Mbeki's goals of increased investment in the local economy and broader participation by South African companies in domestic (and regional) economy. Money that would normally be spent on proprietary licenses (i.e., exported) is retained and re-invested internally. According to Anton de Wet, CIO of Obsidian Systems, "There's no question that Open Source lowers the barriers to entry in the IT market for South African businesses." Obsidian is one of a small but growing number of South African companies that specializes in OSS services and support. "We simply couldn't offer our services if we had to ask a proprietary software company's permission every time we wanted to change the code," says de Wet.

OSS can also help improve government services by lowering costs and making education, health and vocational services more accessible through localization. According to Clive Smith, Director of the HP icommunity project in South Africa, the ability to tailor Open Source applications to local languages, cultures and literacy levels is crucial for providing services in less developed areas. Smith points to the OpenOffice application suite – with menus in all 11 of South Africa's official languages – as an example of cost-effective localization. Users who lack the means to buy proprietary software also benefit from an ever-increasing catalog of freely-distributed OS software for school administration, curriculum support, professional development, multimedia skills, etc. Thus, Open Source software makes basic literacy as well as computer skills and information more accessible to millions of previously disadvantaged South Africans – a key element of the Department of Education's Strategic Plan (2005-2010). [vi]

An Open Source Task Team comprising key public, private and non-profit sector representatives recently affirmed that the use of Free Open Source Software/Open Content (FOSS/OC) can further national development goals by lowering costs, increasing productivity, and improving citizen convenience, while enhancing security, interoperability, scalability and efficiency. The Task Team's report concluded, "Because of these developmental benefits, the adoption, support and promotion of FOSS/OC supports development objectives in ways conventional proprietary software cannot." [vii]

South Africa's OSS Policy

A multi-sector OSS working group, tasked by the Government Information Technology Officers Council (GITOC) and reviewed by the Presidential National Commission on Information Society and Development, is responsible for articulating South Africa's Open Source policies. After several iterations, the current OSS policy includes the following recommendations:[viii]

- Government must implement (FOSS/OC) unless proprietary software is demonstrated to be significantly superior.
- Current proprietary software must be migrated to FOSS/OC whenever comparable software exists.
- When FOSS is not chosen for a new project, the use of proprietary software must be justified.
- Government should create a supportive FOSS/OC environment by building knowledge, understanding and capacity, supporting broad FOSS/OC Research and Development initiatives, enforcing and giving preference to the use of FOSS, and encouraging the trial use of FOSS/OC.
- Government should promote public access to information by driving and embracing FOSS/Ocbased electronic service delivery.
- All content produced by the government must be Open Content, unless proprietary licensing or confidentiality is substantially beneficial.
- The policy on FOSS/OC must be legislated to give it the full force of law. This policy should be implemented with a sound strategy and supported by adequate resources and strong commitment.

The UNDP describes four categories of OSS policy, on a scale from prescriptive to voluntary. These are 1.) Mandated use of OSS, 2.) Preference for OSS, 3.) Mandated Open Standards, and 4) Best Value – a vendor neutral approach. South Africa is considered to have a "preference" for OS software (Category 2).[ix]

To date, no official law has been passed by the legislature endorsing the OSS working group's recommendations. The policy has, however, been approved by the Cabinet and implemented by individual government departments. In addition, the overall South African OSS strategy has been praised by the US-based Center of Open Source and Government, among others, because it 1.) recognizes the legitimacy and social value of Open Source, 2.) designates the national government IT agency (SITA) to lead the program, 3.) levels the playing field in government procurement, and 4.) specifies a three-phase implementation plan that builds local capacities around Open Source.[x]

It is worth noting that few, if any, of the OSS advocates in the South African private or non-profit sectors support a government mandate in favor of Open Source, exclusive of proprietary software. As one OSS proponent explained, "Ultimately, it's about choice. People should be able to identify their needs and compare all the available options. There shouldn't be any legislative or technical barriers that make any options unavailable." [xi]

Implementation and Enforcement

As in other countries with formative OSS strategies, implementation of South Africa's Open Source expansion initiative cannot be said to have taken place in a coherent, lockstep fashion. The government's nascent OSS policy took shape alongside a growing Open Source movement involving a broad range of organizations, both domestic and international.

Since 2002, the primary facilitators of OSS policy development within the South African government have been the Government IT Officer's Council (GITOC) under the guidance of the Department of Public Service and Administration (DPSA). In addition, a Presidential National Commission was formed in 2004 to consider broader information society issues, build on the GITOC policy recommendations and coordinate input from various organizations inside and outside the government.

Policy implementation has been charged primarily to the State Information Technology Agency (SITA), a public company under the auspices of the DPSA. SITA has led by example, demonstrating its commitment to OSS expansion by executing and publicizing multiple Open Source experiments and pilot implementations in various settings throughout South Africa. SITA finds a strong ally in the Council for Scientific and Industrial Research (CSIR), the long-established leader of research and innovation in South Africa. In addition, policy implementation is guided by the National Task Force on Free and Open Source Software and Open Content (FOSS/OC). The FOSS/OC Task Force has created an oversight/advocacy group that includes representatives from government, the private sector, labor, the non-profit sector and the global Open Source community.[xii]

The OSS working group recently proposed concrete goals for OSS implementation (see Table 1).[xiii] Measuring the success of OSS implementation has proven challenging, however. Government does not track performance metrics as carefully as corporations. Estimates on cost savings are based on calculations of pilot programs and past expenditures for software license fees. A small implementation of OSS in 2003 was estimated to have saved the government R10 million (~$1.5 million).[xiv] The South African government spends between $350-450 million annually on software licenses, and over $1.5 billion when support and upgrades are considered. SITA has not published figures for total expected expenses or savings as OSS implementation accelerates, but at R1000 - 5000 in annual license fees for each of the government's 300,000 computers, savings should be substantial.[xv]

Table 1 – Goals for OSS Implementation

Area of Measure	Recommended Targets for 2006
State budget	10% of all Government ICT expenditure is on OSS
Installations	20% of school labs have OSS installed 60% of web servers use OSS 30% of office infrastructure (e-mail, DNS, proxy) use OSS 30% of desktop applications use OSS
Skill levels of key personnel	60% of IT personnel are OSS trained 10% of IT personnel are OSS certified 20% of teachers responsible for school ICT labs are OSS trained 40% of HEI institutions utilize OSS education and teaching tools
Awareness	100% of all CIOs and IT personnel are OSS literate
Localization (language and content)	20% of Government produced information available in more that 2 official languages 50% of published Government content available electronically in an open standards format
Market for service providers	30% of all new systems are able to run in an OSS environment
Government procurement	60% of servers are able to run OSS

Nhlanhla Mabaso, Open Source Centre Manager at the Meraka Institute (the OSS implementation arm of CSIR), measures the success of Open Source initiatives by studying balance of trade figures, tracking domestic and international media attention, and considering the increase in OSS adoption rates by government agencies and large enterprises.

Mabaso explains that, if OSS cost savings goals are met, software expenses should decrease, and the balance of trade should tip in South Africa's favor over time. The frequency and quality of OSS commentary has increased in the mainstream media since the government began to consider Open Source in 2001, and CSIR was approached by the government of Malaysia to participate in an advisory panel on OSS strategy in that country. Some high-profile government agencies are migrating to Open Source platforms, including the South African Revenue Service, SITA, the Department of Science and Technology, the Department of Home Affairs, and the country's largest and most IT-savvy municipalities, Cape Town and Johannesburg. In the private sector, Nando's, Pick 'n Pay, Vodacom, Telkom and Medscheme have recently adopted OSS. The scope of these projects ranges from small-scale pilot initiatives to broad migration of servers and desktops.

Mabaso cautions against interpreting intent to migrate to OSS as ensuring "successful implementation." Even when there is policy alignment and funding, migrating from proprietary to OSS (or mixed) platforms and solutions is a difficult task. Another potential hurdle to broad government OSS implementation is the relative autonomy of federal, provincial and municipal offices. While national agencies may choose or recommend Open Source, provincial branches of the same agency or local municipalities may not follow. It is unclear the extent to which OSS is considered an option for new software purchases, as the national OSS policy recommends. SITA and other government agencies involved in policy implementation lack the funds and personnel to enforce the policy's dictates. In some instances, the press has reported when proprietary software was apparently chosen over OSS without a proper evaluation.[xvi]

Catalysts for OSS Expansion

Strong domestic non-governmental organizations

The non-profit sector has played a key role in the nationwide expansion of Open Source in South Africa. Many non-profit organizations start projects in isolation, but join the Open Source community when OSS is identified as a way to cut costs or make ICT more accessible through localization and voluntary support.

South Africa's non-profit sector is especially vital and well-funded. It engages 3.4% of the economically active population, much higher than the developing country average of 1.9%. The relationship between non-governmental organizations (NGOs) and the government is quite close. In many rural areas, NGOs deliver critical social services in partnership with local or national agencies. Indeed, 44% of the non-profit sector's $2.4 billion in total annual cash revenues come from the government.[xvii]

Similarly, international development organizations such as the United Nations (and its subsidiary agencies), the World Bank, the African Union, Britain's Department for International Development, and Canada's International Development Research Centre (IDRC) provide funding and guidance for many projects. The regional New Partnership for African Development (NEPAD) recently issued a strong endorsement for OSS, saying it would stimulate local software industries.[xviii] Since NEPAD is headed by South African President Thabo Mbeki, the organization's OSS position may add incentive for South African government bodies to embrace OSS as an example for the rest of Africa. Finally, many foundations that support development work are turning to Open Source for projects with ICT components. The Open Society Institute, Shuttleworth Foundation, Google Foundation, Markle Foundation, and Wikimedia Foundation either have OSS projects under way in South Africa, or provide general support and guidance on Open Source to the non-profit sector.

Increased public awareness

Proprietary software dominates the worldwide market in part because of a robust marketing and cobranding effort by vested multinational corporations. Microsoft Windows and Microsoft applications are so ubiquitous, many computer users are not even aware that there are OSS alternatives.

Key Events in Implementation of Open Source Expansion Policy in South Africa (2001-2005):

2001

- The South African Government begins debate on using Open Source Software and Open Standards in government. The Government Information Technology Officers Council (GITOC) is tasked with forming an OSS working group to formulate policy.

2002

- The National Advisory Council on Innovation (NACI) provides the OSS working group with research results on potential benefits of adopting OSS in the public sector.

2003

- January – GITOC presents a strategy paper recommending the use of open standards and open source software in government.
- October – CSIR Open Source Center offically launched by CSIR and the Department of Science and Technology.

2004

- Summer – Presidential National Commission drafts OSS strategy, building on the 2003 GITOC version.
- June – "Go Open Source" campaign kick-off
- July – Opening of a second Open Source Center at the HP i-Community at Mogalakwena.

2005

- May – The African Advanced Institute for Information and Communication Technology (AAIICT) - also known as the Meraka Institute - is launched in Pretoria.

In South Africa, several initiatives have been launched to raise public awareness and usage of Open Source. In 2004, the Shuttleworth Foundation, Hewlett Packard, Canonical, and CSIR's Meraka Institute formed a coalition to fund a broad OSS promotional effort, including conferences with public and private sector stakeholders, the distribution of 50,000 free software CDs, and a two year "Go Open Source" campaign that featured a 13-part prime-time television series. These activities have received significant media attention. CSIR's three Open Source Centers and an additional Open Source Resource Center planned by CSIR, SITA and the DPSA's Centre for Public Service Innovation (CPSI) have likewise generated strong interest.

Public awareness of Open Source has been augmented by the emergence of celebrated OSS advocates. Mark Shuttleworth, for example, is a well known South African businessman, "afronaut" and director of the Shuttleworth Foundation. The Foundation recently installed OSS "TuxLabs" in 200 South African schools, and Shuttleworth's company, Canonical, has given away 1.7 million copies of its Open Source Linux distribution, *Ubuntu,* worldwide.[xix] Shuttleworth sits on President Thabo Mbeki's influential International Technology Advisory Committee, underscoring the partnership between the public, private and non-profit sectors.

OSS Best Practices in South Africa

- Include a broad range of stakeholders in OSS policy formation.
- Raise public awareness of OSS as an alternative to proprietary systems.
- Build OSS R&D, support, manufacturing, supply and distribution capabilities through education and a supportive business environment.
- Exploit the relative strengths of public, private and non-profit partners to drive OSS expansion.
- Establish well-measured pilot implementations in various settings.
- Capitalize on an environment of competing business models to further national development goals.

Private sector participation

Increasingly, multinational ICT companies and small, local businesses are encouraging the adoption of Open Source. IBM, HP, Novell, Oracle, SAP and other global ICT companies are materially participating in a wide variety of provincial and national OSS initiatives. HP's i-community, run in partnership with local government partners in rural Limpopo Province, trained over 4000 people in basic computer skills on a 100% OSS network. IBM SA has launched two Linux Competency Centres at the Wits University Johannesburg campus and the University of Cape Town. The centers, launched in partnership with Novell, SAP and local company Obsidian, are helping to establish OSS/OC standards and provide hardware for non-commercial OSS research and development.

Conclusions

Though OSS adoption in South Africa is still in its early stage, a number of significant conclusions can be drawn. These conclusions have implications for other emerging market countries that are investigating potential benefits and drawbacks of Open Source Software.

Build the entire value chain

The support of high-profile NGOs and global ICT companies, combined with the authority and policies of government, has raised awareness of OSS in the South African experience. However, full confidence in OSS will not be realized until skills have increased throughout the entire value chain.

Hilton Theunissen, Manager of the Shuttleworth Foundation's successful TuxLabs project,[xx] points out that OSS helps public schools reduce technology costs, but very few teachers have experience with computers. For OSS projects to be successful, especially in rural areas where proprietary and Open Source platforms have a relatively level playing field, OSS development and support must be built into the initiative.

On a national scale, comprehensive OSS education and training programs must be created to increase the supply of programmers, technicians and trainers. In South Africa, several programs have already been created as part of the government's effort to raise sector-specific skill levels among previously disadvantaged youth. However, these programs could be refined and better integrated with the private sector to maximize their effectiveness. The local IT industry must also develop viable OSS alternatives to the traditional models of technical support, design, research and development, manufacturing, supply chain and distribution. In South Africa, many small companies have been created to fill these value chain functions, but they must be competent and robust enough to compete with highly-efficient, well-funded global hardware and software companies.

Form strong partnerships

Partnerships are often cited in the South African OSS community as essential for effective policy implementation and expansion. The national coalition behind the "Go Open Source Campaign" (the

Shuttleworth Foundation, HP, Canonical, and the Meraka Institute) countered the marketing strength of proprietary software companies. Partnerships were also responsible for the development of *ImpiLinux,* a localized variant of Linux for the enterprise market, and for the creation of *translate.org.za*, a non-profit organization that produces free Open Source Software in South Africa's 11 official languages.

Public/private/nonprofit partnerships have brought certain advantages to South African OSS initiatives that proprietary software companies cannot duplicate. National and provincial governments can craft legislation, allocate resources, build infrastructure and create incentives for honest evaluation of proprietary and Open Source software platforms. In South Africa, the government is also the leading consumer of ICT, and a strong proponent of cost-savings and local innovation/industry development – two of the most commonly cited advantages of OSS.

Multinational corporations can contribute marketing savvy and lend credibility to the business case for OSS. Clive Smith, leader of HP's Open Source-based i-community initiative in Limpopo, explained, "When HP, IBM, Novell and other big companies get involved, the rest of the business community is assured that Open Source is not simply a fad or ideological movement. When these companies say there's merit to claims of cost savings, security and flexibility, people know there are numbers and delivery behind those statements." Non-profit organizations and community-based groups often perform service delivery roles in South Africa. They are leaders in the national movement for job creation and skills enhancement, and they have a strong presence in less developed areas where proprietary software is less entrenched. The involvement of these organizations in OSS initiatives can yield positive results.

Foster healthy competition

The choice for computer users in South Africa is not just between software technologies. After all, the Windows, Apple and Linux operating systems and applications all look similar and perform most of the same functions. The choice today is also between business models. The proprietary model is built on customers paying for licenses to use privately-designed software. The OSS business model emphasizes community development and free distribution, for which some users buy development and support services. Each of these models has its own advantages and disadvantages for the customer. The relative merits of each model are expanding the overall customer base and creating a new kind of competition in South Africa's software industry.

The OSS movement – distributed and decentralized in nature – has no dedicated marketing department, nor can individual OSS companies currently compete on a global scale with multi-national IT corporations in the areas of manufacturing, supply chain or distribution. However, in South Africa, local companies and cross-sector coalitions have proven that they can assume these functions, as well as research, development and design, on a national or regional scale. The resulting pressure on the dominant business model has caused proprietary software vendors to be more customer-focused in South Africa, making improvements to their products and offering additional savings or discounts. Governments at the local and national levels are capitalizing on this changing software environment to achieve their own national development goals.

Projected Linux Growth (Global)
2003-2008 CAGR

	Desktop	Server
Americas	32%	25%
EMEA	31%	23%
Asia Pacific	29%	31%

While quantified benefits of OSS in terms of cost savings are not yet available in South Africa, ensuring choice and building the local capacity to compete for all parts of the value chain seems to have had a healthy effect on the local software industry, social development and equality.

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[ii] *International Financial Statistics Database, 2004*. International Monetary Fund (IMF).

[iii] *Open Software & Open Standards in South Africa, A Critical Issue for Addressing the Digital Divide, Version 1.0*. (January 2002). National Advisory Council on Innovation, Open Software Working Group. p.2. Retrieved November 24, 2005 from http://www.naci.org.za/pdfs/oss_v_1_0.pdf.

[iv] *Comparison Study of Open Source and Proprietary Software in an African Context: Implementation and Policy-making to Optimise Community Access to ICT*. (April 2003). Bridges.org in collaboration with SchoolNet Africa. Presentation at ICTs in African Schools Conference, Gaborone, Botswana. Slide 12. Retrieved October 10 from http://www.bridges.org/software_comparison/SoftComp_ScopingStudy_Apr03.pdf

[v] *Open Software & Open Standards in South Africa, A Critical Issue for Addressing the Digital Divide, Version 1.0*. (January 2002). National Advisory Council on Innovation, Open Software Working Group. p.2. Retrieved November 24, 2005 from http://www.naci.org.za/pdfs/oss_v_1_0.pdf.

[vi] In 2003, Microsoft announced that it would open its source code to selected governments, but South Africa had alreadydetermined its OSS strategy. The Microsoft agreement would have allowed for some localization, while preserving restrictions on redistribution and potentially invalidating service agreements.

[vii] *Go Open Source Task Team Conference Working Paper*. (August 2005). Retrieved September 25, 2005 from http://radian.co.za/fossconference/GOSS_TTC_workingpaper101.pdf

[viii] *Ibid*.

[ix] Wong, K. (2004). *Free/Open Source Software: Government Policy*. UNDP-APDIP: e-Primers on Free/Open Source Software. p.17. Retrieved October 22, 2005 from http://www.iosn.net/government/foss-government-primer/foss-govtpolicy.pdf

[x] Weerawarana, S. & Weeratunga, J. (2004). *Open Source in Developing Countries*. Swedish International Development Agency (SIDA). pp.97-99. Retrieved October 24, 2005 from http://www.sida.se/content/1/c6/02/39/55/SIDA3460en_Open%20SourceWEB.pdf

[xi] C. Smith, personal communication, October 13, 2005.

[xii] SITA was established in 1999 "to consolidate and coordinate the state's IT resources in order to achieve cost savings through scale, increase delivery capabilities and enhance interoperability." The FOSS/OC Task Force and managing group are Open Source-specific entities supported and fully resourced by a Cabinet mandate.

[xiii] *Go Open Source Task Team Conference Working Paper*. (August 2005). Retrieved September 25, 2005 from http://radian.co.za/fossconference/GOSS_TTC_workingpaper101.pdf

[xiv] Stones, L. (January 20, 2003). State to save billions on software. *Business Day*. Retrieved October 1, 2005 from http://www.businessday.co.za/Articles/TarkArticle.aspx?ID=683978; Yarney, J. (July 08, 2003). South Africa, Nigeria move on Linux adoption , OS seen as a cheaper alternative to Windows. *IDG News Service*. Retrieved on October 10 from http://www.infoworld.com/article/03/07/08/HNafrolinux_1.html

[xv] SITA Issues Open-Source Software Tender. *Business Day*, September 22, 2005. Retrieved October 10, 2005 from http://www.businessday.co.za/Articles/TarkArticle.aspx?ID=1653742

[xvi] Geyde, L. (October 14, 2005). USA-Microsoft partnership suspect? *Mail &Guardian*. p. 4.

[xvii] Comparative Data Tables, *Table 4: Civil society sector sources of support, with and without volunteers, 34 countries*, and Country Data Tables, *The civil society sector at a glance: South Africa, 1998* (updated January 18, 2005). Comparative Nonprofit Sector Project, Johns Hopkins Center for Civil Society. Retrieved October 8, 2005 from http://www.jhu.edu/%7Ecnp/pdf/table401.pdf and http://www.jhu.edu/~cnp/pdf/southafrica.pdf, respectively.

[xviii] Malakata, M. (October 24, 2005). Development agency urges open source for Africa. *IDG News Service.* Retrieved October 27, 2005 from *http://www.idgnews.net/intl/international.nsf/0/00256AF50054FFC1002570A4005F96DA?OpenDocument*

[xix] Stones, L. (May 25, 2005). Task Team Set Up to Act on Open Source. *Business Day*. Retrieved October 14, 2005 from http://www.businessday.co.za/articles/article.aspx?ID=BD4A49063

[xx] According to Theunissen, the Shuttleworth Foundation has brought the cost of installing a 20-seat computer lab down from US$75,000 to US$4,500 by using donated, refurbished hardware and thin client, Open Source technology (personal communication, October 12, 2005).

About Vital Wave Consulting

Vital Wave Consulting enables accelerated revenue growth in emerging markets through strategy consulting, market research and scenario forecasting. The company engages with multinational corporations in the information technology and telecommunications industries. For more information, please contact:

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