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TO WHOM IT MAY CONCERN

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An ICT maturity model and self-help resource toolkit for African NGOs

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Abstract

This paper describes a project to develop and refine an ICT (Information and Communication Technologies) resource toolkit aimed at small African NGOs. The ultimate objective is to increase the effective deployment of ICTs in small organisations who find themselves on the wrong side of the digital divide by enabling them to help themselves. The core tool is an extensive, graded ICT maturity self-assessment based on a series of simple questions around nine critical ICT-readiness areas, each subdivided into one of four maturity levels. The instrument, which is vendor and platform agnostic, includes a guide on how the organisation can move from one maturity level to the next. A prototype of this instrument has been developed using seed funding from NGOConnectAfrica and has just been released into the Creative Commons. The final toolkit will complement the ICT/e-readiness and maturity self-assessment instrument complemented with a comprehensive set of resources to assist small organisations at increasing their effectiveness using appropriate ICTs.

Context and contribution

ICTs can bring tangible benefits to NGOs in developing world contexts as evidenced in both anecdotal and statistical form (Mpye, Osman & Van Belle, 2007). The appropriate use of ICTs can not only increase the efficiency and effectiveness of small organisations, but it strategic ICT use may also help NGOs to leapfrog the digital divide by innovative uses of ICTs such as mobile internet access, technology-assisted CRM, digital story-telling, open source platforms, disintermediation, etc.

However, traditionally, ICT vendors and pundits have rarely taken into account the constraints and capabilities of working in an African context where ICT skills are relatively rare and access to ICT infrastructure, resources and skills is problematic. Additionally, much of the ICT4D (ICT for Development) and Development Informatics research has taken place at a policy or aggregate level. This resulted typically in recommendations for national or local governments, policy bodies and similar institutions. Although governments try to provide ICT support and guidance to small organisations, it seems that this meet with relatively little success, even in developed nations (Dyerson, Harindranath and Barnes, 2009).

On the other hand, a host of websites offer a variety of documents and information related to organisational ICT use. However, most of these sites are vendor-driven and exude a strong marketing bias. The resources are often not screened for suitability and not integrated in an overall framework. Few resource sites are geared specifically towards NGOs and even fewer focus on organisations working within an African (or even more general developing world) context. A good example of a non-commercial resource site that comes close to this ideal is www.smetoolkit.org but this site is lacking a coherent framework for assessment where an organisation stands in respect of its ICT capability and what it needs. It is also not focussed specifically on ICT and thus lacks depth and breath in the ICT resources it provides. More importantly, lacks a strong

developing nation focus and contains little or no customized content. Another good source of ICT advice is www.ictclub.org.uk which contains numerable interesting documents but, again, it lacks an integrative assessment approach.

A number of organisations have focussed on the specific needs of African NGOs. A well-know and established organisation is SANGONET which aims to network NGOs in Southern Africa through its associated [iConnectOnline](#), [SangoTech](#) and [NGOPulse](#) portals. More recently, [NGOConnectAfrica](#) was launched which aims to build an online NGO community: “to enable and connect non-profit organisations by means of technology. For this, they are creating an online meeting space for like-minded non-profit entities, and the individuals, organizations and commercial and governmental entities that support them.” (NGOConnect Africa, 2008)

Bridging the knowledge and resource gap may narrow the digital divide thus providing a direct impetus, not only to the NGOs concerned, but also to the Africa’s IT industry by increasing demand for IT services. It may provide indirect impacts by growing the local economies through increased productivity and increasing the IT knowledge base of decision makers in small organisations. Finally, this project may create a feedback loop to the larger IT organisations sensitising them of the specific needs and challenges faced by small organisations in a developing world context, opening up a dialogue and engagement with this long-neglected sector.

Developing a self-help resource toolkit for African NGOs

The larger research project is aimed at developing a self-help resource toolkit for African NGOs in order to promote the effective adoption of appropriate and relevant ICTs by NGOs operating within a African context with its unique constraints and challenges. This paper reports on the first step in this process concerns , namely the development of a easy-to-use ICT- and e-readiness maturity model as embodied in an instrument which NGOs can self-administer and which is supported by a graded set of easily accessible self-help resources.

In the longer term, the results of this would be mapped against a formal but practical, real-world decision framework which would generate architecturally sound, sustainable ICT platform options. Work is already underway to create a supplementary self-help resource bank to follow up the assessment with a carefully selected set of introductory **resources** including introductory, "How-to", "Dummy-Guide-To" and checklists resources on various aspects of the technologies and applications. Pointers to **existing** relevant and appropriate documents in the public domain (i.e. available for download from corporate and academic sources) will be sourced and organised. Where possible, permission will be sought to allow for local caching as well as distribution of the documents on the CD/DVD. However, many are being custom-written for this project by students majoring in Information Systems as part of their curriculum requirement at the University of the researcher. These will all be released under Creative Commons or Open Source.

A first **initial version** of the toolkit is currently being disseminated and tested via NGOConnectAfrica’s website(www.ngoconnectafrica.org) as well as a number NGO workshops. Additionally (m)any of the resources will hopefully be made available directly or via linking through the wide variety of existing web portals that target African NGOs and small businesses. Finally physical copies (preferably in electronic format i.e. free-to-copy CD/DVDs) will be available at a nominal distribution cost through a



NGO
ICT- and e-Readiness
Self-Assessment Tool

¹th Annual Conference on World Wide Web Applications, Port Elizabeth, 2-4 September 2009 (<http://www.zaw3.co.za>)

number of resource centres, such as development agencies, libraries or telecenters.

The self-assessment tool was originally commissioned for the NGOConnect Africa project which is managed by PotentialAfrica. It is released under the Creative Commons Attribution-Non-Commercial-Share Alike 2.5 South Africa Licence. Note that the instrument is quite particular to the African situation: ICT skills are relatively rare and access to ICT infrastructure, resources and skills is problematic.

Although other developing nations struggle with similar problems, some issues differ e.g. India has a much denser concentration of ICT skills than the African continent. Unfortunately, there is even a wide disparity of resources even within the African continent so currently the toolkit has to strike a happy medium between the extremes.



Terminology

The instrument is aimed at **NGOs (Non-Government Organisations)**, used here in the sense of a not-for-profit organisation which is engaged in an activity promoting the public interest. Obviously this toolkit can also be used by other organisations (sports organisations and churches) so there is no real need to distinguish between NGOs, NPOs (Not-for-Profit Organisations) or CBOs (Community-Based Organisations) although their differences are acknowledged.

ICTs (Information and Communication Technologies) covers any computer-based technologies used for digital information manipulation and communication although, technically, this also includes telephone, fax and similar technologies. However, the use of and integration with mobile cellphone technologies is one of the greatest computing opportunities in Africa. Sometimes "IT" (Information Technology) is used to refer to the computer-related technologies and "IS" (Information Systems) to the combination of computer-based systems (this includes the software applications as well as data and human resources).

Finally, **e-Readiness** is defined here as the degree to which an organisation (or community or country) is prepared and ready to engage in electronic communication via the internet and thus participate in the global knowledge economy. This presupposes that the organisation (or country) is **ICT-ready** i.e. it must possess the necessary ICT infrastructure or resources as a platform to engage from.

Brief survey of existing organisational e-readiness instruments

There are a number of other "**e-readiness instruments and surveys**" available on the internet. Most of these instruments focus on the e-Commerce infrastructure of entire nations or regions. These are not very relevant for this research. However, there are a number of *organisational-level* e-readiness instruments which have been used in various countries. We briefly discuss a selection of the better ones. A more detailed survey (and copies of the actual instruments) is available on simple request from the author.

The **ICT Health Check Self-Assessment Form** developed by the CLIO Black Country Program is a very nice 14-page self-assessment instrument which classifies question (or their answers) into 3 maturity levels. However it is biased towards larger organisations (Stoneley, 2007). It is derived from the LASA ICT Health Check List.

The CSPP Readiness Guide for living in the networked World (CSPP, 2002) is a self-assessment tool for communities which they commission from Harvard. It uses a very

nice 4-stage (maturity levels) self-assessment but unfortunately it is limited to networking aspects. It is very much geared to first-world environments and the boundary conditions (e.g. 25%-50%) for the various stages appear rather arbitrary.

The Digital Divide Assessment of the City of Cape Town (Bridges.Org, 2002) is a comprehensive report on the e-readiness of communities, organisations and individuals in the Cape Town metropolitan area. The comprehensive report contains two questionnaires in the appendices, one for Capetonian individuals and one for (intended: business?) organisations. The second one subsequently formed the basis for the study on Computer Use in NPOs in the Western Cape (Vosloo & Van Belle, 2006) which used a 6 page questionnaire derived from Bridges.org's but expanded substantially & customized for NGOs. Interestingly, this study showed that the greatest determinant in ICT adoption and e-readiness for NGOs proved to be geographical location: NGOs located in rural areas were statistically significantly less e-ready than their counterparts in metropolitan areas (Van Belle & Vosloo, 2007).

The Eurostat model for a Community Survey on ICT Usage and e-Commerce in Enterprises is a 6-page, very well designed questionnaire with 4 pages of ICT definitions at end. Meant as a model to be customized by European countries as input for Eurostat statistics. The first few pages are interesting and very useful but the last few are very focussed on B2B E-commerce.

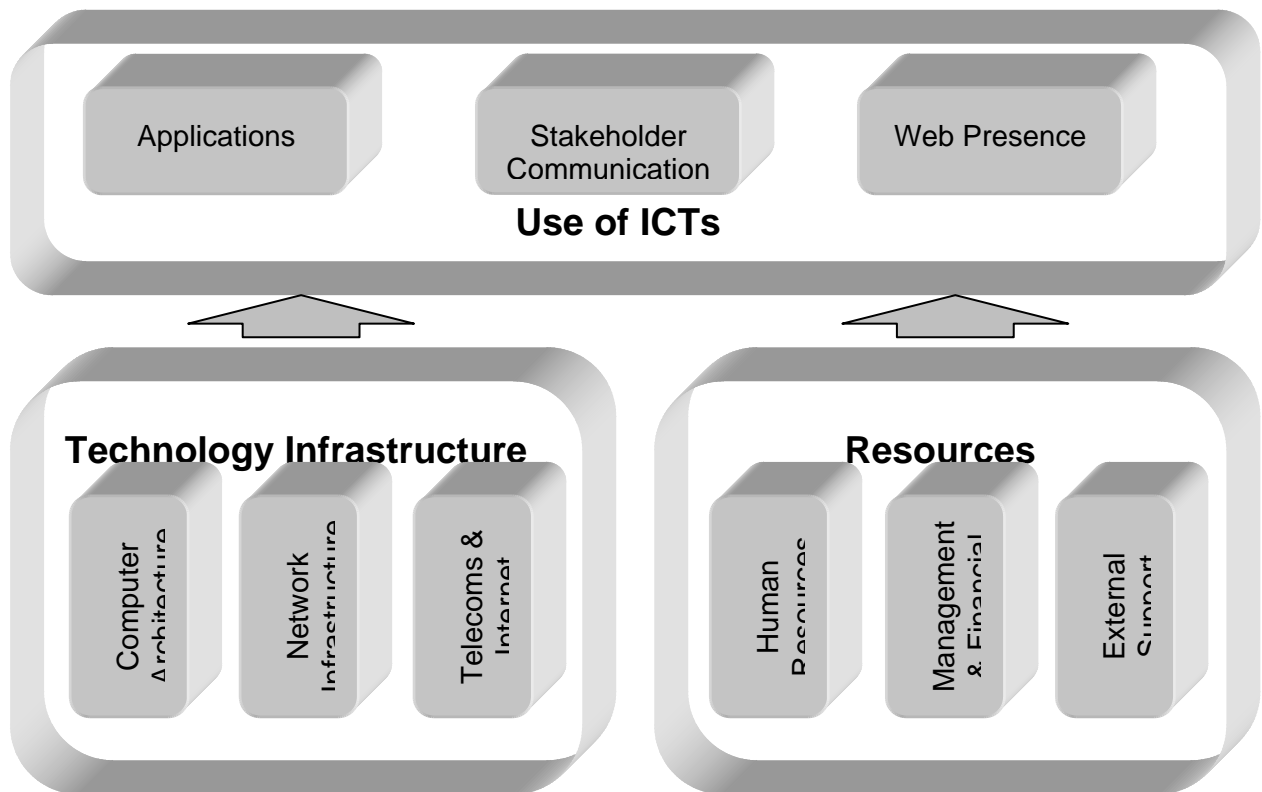
ICTs for SMMEs (Mpye *et al*, 2007) is a report based on a 5-page questionnaire & interview questions for SMMEs in Cape Town. It is quite useful though somewhat basic. It looked at basic communications and computer needs i.e. it was specifically geared towards an LDC context/environment. Some of the questions were based on a Belgian and Dutch research program.

A final interesting research report is the e-readiness instrument framework proposed by Huang, Huang & Huang (2004) although its large number of areas make it a little cumbersome to implement for self-assessment questionnaires.

Key areas included in the self-assessment tool

Somewhat arbitrarily, three major areas were identified for the self-assessment, each in turn divided into three sub-areas. The most important area is (the level or sophistication of) the actual use of computers in the organisation (area 3). However, this capability is normally only achievable if the necessary technological infrastructure (area 1) and required resources (area 2) are at a compatible maturity level. The diagram below illustrates how the different maturity areas are related.

Figure 1: The key areas considered for ICT- and e-Readiness



Each of the areas is discussed briefly below.

Technology infrastructure

The first key area to evaluate is the NGO's technology infrastructure: without having a sound technology in place, it will not be able to reap the possible computerisation benefits. The three technology infrastructural aspects considered essential are the availability of computers in the organisation, the degree to which these computers are linked together within the organisation (the computer 'network') and the organisation's electronic link to the outside world, more specifically the Internet.

Computer infrastructure

The most essential step in moving towards computerisation is to give employees access to computers. In the ideal world, any employee who works with information should have access to a computer. The tool concentrates on personal computers in the form of laptop or desktop computer. A future extension of this assessment will deal with the exciting opportunities opened up by powerful handheld devices such as top-end Personal Digital Assistants (PDAs).

Network infrastructure

Once an NGO has more than one computer, it will quickly discover the need to share information between them, or access devices connected to one of the other computers. Indeed, just like a team can be much more productive and powerful than an individual, many benefits of computerisation can only be realised once the NGO connect its

computers in a network.

Internet/telecoms infrastructure

The biggest but, in Africa, typically also the most difficult and expensive ICT infrastructural payoff comes from having access to the Internet. Being able to communicate electronically with stakeholders and similar organisations as well as being able to tap into the wealth of useful information available on the internet is often the ultimate payback and business enabler of ICT investments. However, this is also the area where NGOs in Africa experience the so-called digital divide most acutely. Internet access is typically much more expensive in Africa than anywhere else in the world – in the order of up to 100 times what it is in Asia or the US. Even more problematic is that many rural areas simply do not have ANY affordable Internet access options. Luckily more and more cell phone companies are providing a wireless internet option which may be affordable for low-bandwidth applications. Currently heavy investments are being made to give the continent as a whole much more and cheaper access to the Internet by dramatically increasing undersea cable capacity. Finally, there are also some exciting moves to provide affordable satellite internet access in the medium term.

Resources

It is important to ensure that the NGO has sufficient resources to deploy ICTs. There is often a trade-off between the different resources: e.g. if it has strong financial resources, it can afford to contract external consultants or train its internal staff. On the other hand, if it has ICT-literate staff, it may well be able to find cheaper alternatives and reduce support requirements. Similarly, if it has enthusiastic and motivated staff, it may be able to explore low-cost alternatives such as Microsoft's Authorised Refurbishers program to get very low-cost computers, solicit corporate computer donations, get Microsoft software virtually free under its NGO programme or explore open source software options.

Human resources

Despite the emphasis on the technical aspects of ICTs, effective ICT use is ONLY possible if the NGO and its staff **have the right skills, attitude and motivation**. The most expensive, up-to-date computers will stand idle if staff does not want or know how to use them effectively, whereas motivated staff will usually find ways to use even outdated software and hardware in surprisingly novel and productive ways. This tool focuses on the staff's technical (i.e. computer) skills but it is equally important to motivate staff by convincing them of the value of computer use in the NGO (and the benefits for themselves).

Interestingly, appropriate computer training will provide its staff not only with the necessary skills but often also with the motivation to use computers. And, counter to the fears of many executives, staff who have been trained by an organisation will often develop a stronger sense of loyalty to the organisation. The organisation's investment makes them feel valued as individuals so they are less likely to use their skills as a motivation to move on to 'greener pastures' i.e. other organisations. Of course, the NGO will need to reward your staff adequately for their newly acquired skills and additional contributions to your organisation.

Management and financial resources

A key step to deploying ICTs is to have some financial resources – not only to buy the

hardware but also to acquire software, maintain the systems, pay for connectivity and provide training to staff. Equally if not more important to the continued positive impact of ICTs in an NGO is to have proper management of ICTs in place. This includes the planning of future ICT adoption as well as the need to put proper procedures in place. The latter is very important because the computerisation of information exposes the NGO to a very different set of business and continuity risks than manual systems: some problems are solved but new POTENTIAL problems will arise if insufficient care taken. This section looks mainly at security and backup issues as well as some forward planning.

External support

It is important to have an external ICT support system or resource access. When using ICTs, there are many things that can and will go wrong. Generally problems are addressed in a tiered-level approach. Although most basic issues should be resolved in-house, the NGO will quickly run out of goodwill if it needs to draw on a favour from an (external) IT-savvy friend each time a user needs to replace a printer's ink cartridge, its internet link is down, it installs a new program, one needs to know how to format a table or has forgotten where he/she saved a document. However, a number of problems are likely to be more technical and/or require specific expertise. Developing the skills required to build a fancy website, to configure a mail server or to replace a computer hard drive/power supply are not really necessary inside a small NGO and these are initially best sourced from an outside consultant or vendor on an ad-hoc basis. In the longer run, the NGO should slowly transfer certain ICT skills from outside support sources to in-house skills e.g. setting up its first cabled network is likely to require a local IT vendor, but the NGO's staff should quickly learn how to add new computer "nodes" (network connection points). Similarly, adding memory into a computer or configuring new software applications are very learnable skills once the initial and mostly mythical computer-phobia barrier has been broken. A remote organisation may wish to build up stronger in-house skills but should not discount the possibilities of telephonic support, internet support forums or remote diagnosis using remote desktop control software.

Use of ICTs

Having checked resources and capacity (infrastructure) for ICT use, it is now time to see how the NGO is actually deploying or using the technology resources at its disposal. Often organisations have the capacity and the resources but do not deploy them to the fullest extent. This area is where it should focus most of its energy because this is ultimately why it has ICTs: to use them. However, it will probably be difficult to increase its use level beyond reaching a matching level in the resources and infrastructure levels.

Because the questions describe the actual levels fairly accurately, the maturity level descriptions and how to move between them are correspondingly shorter in this section. This section should be carefully tailored to the nature of the NGO, the type of processes and activities it is engaged in, and often the type of technologies that are used by its various stakeholders and constituencies.

Applications

This section looks at some of the typical in-house applications which can be used by an NGO. Often, an organisation starts using computers for personal productivity purposes

such as word processing, emailing or web surfing. These are stand-alone applications. The next steps are to share information using collaborative applications as well as deploying organisational information systems which automate some of the business processes. They often cover functional areas and hopefully, often lead to redesigning the way things are done in a more efficient way: faster, more cost-effective and/or higher quality/better service. Eventually, computer use goes beyond the computerisation of existing processes to offer applications which radically transform the organisation, enable it to offer entirely new services or enable internal management processes which were not previously possible or feasible.

Communication with stakeholders

One of the key benefits of computerisation and internet connectivity is that the computer becomes a key communication tool. In areas where there is no fixed line internet but the cell phone company provides data services, computers can still be used for extensive and exciting possibilities.

Even if the NGO's key audience – its clients – generally do not have computer or internet access, it can use its own computers for great benefit. For instance, bulk SMS can be created and sent from your computers. In addition, communication with other stakeholders such as donors and volunteers can happen quicker, cheaper, more effectively and professionally. Additionally, it can make substantial savings on some of its other communication channels: international or long-distance phone calls can be made using VOIP technology (think Skype) and your computer makes for a much better fax machine. If the NGO has a number of internal telephone lines, setting up a computer based PABX running on its LAN may be a godsend (just google "Asterisk").

Web presence

An NGO that has its own website provides inspiration to the community, is very motivating to the staff (especially if they are featured in name, if not in pictures) and just generally a wise public relations move. It is the prime vehicle for keeping existing funders happy (by keeping them informed as well as giving them visibility), for attracting new funding, for informing your community including the media and publicizing its activities to new potential members or users. Creating and hosting a website used to be a very technical job. However, these days it is much easier because many tools and a lot of resources have been created to facilitate the process. But creating an attractive website still requires some dedicated resources (including some creativity and inspiration). Keeping it updated and relevant also requires some discipline and motivation. A good website is not the responsibility of one person (i.e. the fundraiser or manager), ideally many staff are involved with the planning and content creation – the more staff gets involved, the greater their motivation and the better the website.

Principles and maturity framework adopted in the toolkit

Because NGOs are very different in terms of size, nature and location, the proposed self-assessment instrument is by necessity fairly **generic and somewhat superficial**. It consists of a number of different types of information.

For each of the nine focus areas, **four maturity levels** were identified: Level 1: non-existent or very basic; Level 2: early stages; Level 3: intermediate and Level 4: advanced. Table 1 gives a high-level overview of the framework used.

Table 1: ICT-Readiness and Maturity Levels Framework

	Level 1: Non-existent or Basic: "survivor mode"	Level 2: Initial Adoption / Early Stages	Level 3: Intermediate	Level 4: Advanced
Technological Infrastructure				
Computer infrastructure	The NGO has no computers of its own although some staff occasionally use private or personal computer facilities for specific tasks such as budget or proposal preparation.	Hardware: One or very few computers, usually not state of the art. Software: old operating system (eg Win98 or Win2000) with basic software and basic installed software (word processing)	Hardware: all hardware is compatible and capable of running up-to-date OS and software Mix between laptops & desktop where applicable. Good quality peripherals.	Recent spec, compatibly hardware, single/dual vendor; with documentation, inventory. UPS where necessary. Preventative maintenance & upgrade plan. Top quality ergonomic peripherals.
Network infrastructure	no networking, file transfer via USB flash or disk/CD-Rom, printing on station with direct-attached printer	peer-to-peer networking, some shared folders, shared devices (printer, fax) attached to specific computers Link to: how to set up a LAN	file server with groupware applications List of all network addresses & users High-speed networking	Dedicated application servers, database server, web & mail server, possibly virtualized. Network optimization and monitoring tools
Internet/Telcoms infrastructure	use of public Internet (or staff's personal) facilities	single line access using single workstation dial-up or DSL or wireless depending on costing LINKS to: what is dialup, ADSL, 2/3G	broadband access possible dual ISP provision all/most network nodes connected proper firewall	monitoring of bandwidth utilization with possible packet shaping caching/proxy server
Resources				

Human resources	Little or no indepth computer skills - one or a few staff members have some basic computer knowledge	Key staff have formal skills with a small number of 'power users' being groomed into more technically skilled.	All users are computer literate; some are 'power users'. A few staff have intermediate technical skills. Formal and regular training courses.	New staff computer skills are assessed as part of the application. Person-specific training plans, reviewed regularly. Training is seen as an investment.
Management & Financial resources	struggling to meet expenses, donations-driven, uncertain income flow, no IT budget. No ICT governance e.g. un(der)licensed software, virus attacks.	Limited IT budget. Informal IT risk assessment. Aware of data privacy issues. Up-to-date automatic antivirus.	Workable IT budget. Plans for next year. Key business continuity procedures (backup, recovery) in place. Good privacy and security practices (including data encryption). Insurance.	Formal ICT inventory. Adequate ICT Upgrade budget with planned upgrades. Formal ICT risk appraisal and measures including disaster recovery.
Support	No support structure	One single staff member and ad-hoc (expensive) IT service provider.	A mix of some internal staff (with backup) for small/easy problems with escalation to vendor/Internet support.	Formal support and maintenance arrangement with SLA.
Effective ICT Use				
Applications	Some simple wordprocessing, possibly accounting software.	Personal productivity tools and generic standalone 'business' software: simple spreadsheet, presentations, photoediting. One or two more innovative applications (eg.	Vertical applications (i.e. NGO specific) with shared database, desktop publishing, calendaring & scheduling, CRM, inventory & asset management, desktop	content & document management, process/business flow, ERP, project management. Always trying out innovative or strategic apps.

		digital story-telling)	software using templates or macros	
Communication with stakeholders	telephonic or written (printed) letters, paper fax	email with a few people using one or very few accounts - typically linked to ISP (NGO@mweb.co.za) or mail provider (NGO@gmail) account	everyone has own email address using NGO-domain (e.g. jim@NGO.org.za or info@NGO.org.za). Some VOIP, IRC, bulk (low-cost) SMS, internet banking.	Electronic advocacy campaigns, blogging, video conferencing, online multimedia education, active participation in online forums
Web presence	No webpresence or single-paragraph/page listing in national or international directory	Simple website (a few pages) containing basic information on NGO including mission, contact details, some operational information, media articles & information, sponsorship) - hosted on generic (cheap) host- likely as part of ISP package	Multilevel, detailed website still mostly static information but updated regularly with news, events, FAQ, staff profiles, media reports, financial statements, own domain. Pages targeted at specific stakeholders. Signup subscription options, online form, RSS.	Comprehensive interactive site with Web 2.0 elements e.g blog, discussion forum, members area. Online donations or 'shop' options. Integrated with internal document management system.

To determine at which level the NGO finds itself, the NGO starts with the high-level questions for each area which determine at which maturity-level the organisation finds itself.

Figure 2: Questions determine the maturity level



Question: How do you connect to the internet?
(tick all that apply)

Answers/Scenarios	Level	✓
We do not have direct access to e-mail or the internet from within the organisation.	1	
We tried to buy a copy of the internet but apparently it does not fit on our computer.	1	
We use a fixed telephone line dial-up connection using a modem.	2	
We have an ISDN line.	3	
We have a DSL connection (e.g. ADSL).	3	
Other (e.g. WiMax or satellite).	3	
We use mobile connection such as GPRS (level 1) or 3G.	3	
We have a dedicated leased data line.	4	

The user is then directed to a set of more detailed questions that further describe and confirm the maturity level.

Figure 3: Detailed Yes/No questions describing and confirming the maturity level



Level 2: Early Stages

Description	Yes	No
The organisation has non-permanent low-bandwidth internet access from one computer or a reasonably advanced mobile phone, or by means of an account with a nearby and easily accessible internet café.		
Typically this is by means of a dial-up modem although a wireless GPRS-enabled mobile phone can also be used. The limited bandwidth is used to down/upload e-mail and do some directed web-browsing.		
Internet access is limited to one or a few key staff members who typically have at most one (or very few) relatively short internet sessions per day.		

It is useful and instructive to read the description of the other levels as well. Having gone through all of the areas, the NGO can decide which areas it wants to improve. This could be done as a group exercise within the NGO. The idea is to pick the 'lowest hanging fruit first' i.e. improve those areas where the most benefit is gained for the least effort.

The "Moving to the Next Level" sections (example given in figure 4) give information on the type of steps the NGO should consider, especially for moving up the lower levels. Of course these can only be in the form of brief and general hints; they should be followed up using the information sources given and using additional help or information.

We are currently working on a comprehensive set of additional, more in-depth resources which will form an integral if not critical part of the toolkit and assist the

organisation with the “moving up” process to the next maturity level. Many of these resources will be references to existing documents on the web which are being carefully selected for appropriateness and applicability, then mapped to the appropriate ICT readiness area and maturity level. New resources are being developed by Information Systems students as part of their degree requirements and these will be made available using a Creative Commons license.

Currently, the tool includes helpful notes interspersed within the text.

Figure 4: Actions for moving to the next level

Note

- It is often worthwhile to pay a little extra for an ISP which has a proven track record and accessible support help lines.
- Support is expensive for ISPs to provide and the cheaper ISPs often skimp on support since this may be quite invisible when newcomers choose between an ISP.



Move to the Next Level

When moving up to a permanent internet connection with access from multiple computers it is useful to:

Actions	Not possible (give a reason why)	Possible (tick where applicable)		
		Short term	Medium term	Long term
Conduct an informal user needs analysis within the organisation to assess which users need e-mail and internet access and their anticipated bandwidth requirements.				

<p>Investigate the various local options available for internet which typically range from:</p> <ul style="list-style-type: none"> • Dial-up modem • ISDN • ADSL • Wireless 2.5G/3G (not all of these may be available across Africa and in rural areas). <p>The key selection criteria should be:</p> <ul style="list-style-type: none"> • Monthly subscription cost • ISP reliability • Quality of telephonic customer support • Contract lock-in periods (see above). 			
<p>Check that your ISP will provide you with a number of e-mail accounts since one single account is likely to be insufficient for an NGO.</p>			
<p>Another decision which is very important (and a relatively recent trend) is to consider housing all required servers within a single or two powerful physical computers by means of virtualisation software. This eases management and may reduce costs. Note: A detailed discussion of these options is beyond the scope of this document.</p>			

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The document also provides some additional information boxes. Figure 5 gives an example of a shortened information box on Open Source Software. These information boxes will be supplemented by a separate, more comprehensive supporting document.

Figure 5: Example of an information box

Sample Information Box: Open-Source Software

For the application programmes (or software) you will often have the choice between commercial off-the-shelf software, ‘free’ open-source software (OSS), and custom-development. Custom-developed software is strongly discouraged for newcomers in the computer world because of its cost and long-term support issues, unless you have a very specific and special need. Generally, as a novice, you cannot go wrong by opting for the industry standard commercial software (such as Microsoft Office).

There are some good arguments (cost, ease of use, lower hardware requirements) for using open-source software (such as the free and very functional OpenOffice productivity suite) as long as you are aware of the potential issues such as training, transfer of user skills and possible compatibility issues.

NGOs have the exciting opportunity to obtain Microsoft software almost for free. Refer to <http://store.sangotech.org/getting-started> for more information. At the other end of the spectrum, the Open-Source software community has created a CD with a full software solution for NGOs: see <http://ngoinbox.org> for more information.

The main section of the instrument is followed by a list of definitions for the “technical” terms used in the questionnaire. Some of the terms which are defined are: internet, LAN, peer-to-peer network, WiFi, UPS, open source software, Internet Service Provider,

RAM, ADSL, ISDN, backup and internet domain name.

Finally, the instrument concludes with a set of references to useful resources. The following gives an example of some of the resources:

- “For very nice, non-technical and beautifully illustrated explanations on how the various ICTs work (including many articles on hardware, software, security and the internet) your first call should be the **How-Stuff-Works** website: <http://computer.howstuffworks.com/>
- A great website with short text articles illustrating how to do or achieve certain computer tasks, got to **WikiHow**. Its computer section (<http://www.wikihow.com/Category:Computers-and-Electronics>) has several hundreds of short "how-to" articles on various computer aspects. It may take some time to browse the various sub-categories e.g. <http://www.wikihow.com/Category:Hardware> or <http://www.wikihow.com/Category:Networking> (All articles here are available under the Creative Commons license)
- A must-read publication is the "**Guide to Managing ICT in the Voluntary and Community Sector**". A copy is available for download from available <http://www.ictHub.org.uk/publications/> under the Creative Commons license. The **ICT hub** has some other very interesting and applicable publications available from their website such as Charitable Giving and Fundraising in a Digital World, A Guide to Managing ICT in the Voluntary and Community Sector, ICT Signposting guide for small voluntary and community organisations and How Online Communities can make the Net Work for the Voluntary and Community Sector.
- You may know what you want to do but not know how or where to start. Volunteers are excellent at supporting you on projects, providing ideas and advice and developing simple websites and databases. They can even help you identify consultants. A great source of ICT and new media volunteers can be found at: www.it4communities.org.uk (for volunteers who can help you think things through) and www.mediatrust.org (providing access to media professionals and resources) ”

Finally, it must be remembered that NGOs are not expected to aspire to attain level 4 in every area: a small NGO in a deep rural area without electricity and telephone lines should not need an always-on high bandwidth internet connection (even though ambitious plans are underway to make that possible soon using satellite and solar power technology).

Conclusion and way forward

This paper describes a project to build a self-help toolkit which will allow African small and medium-sized Non-Government Organisations (NGOs) to self-assess their ICT- and e-readiness. Its aim is to raise the effective use of ICTs in NGOs by letting them help themselves. The tool is based on an assessment instrument which is informed by a framework consisting of nine ICT-readiness areas, each sub-divided into one of four maturity levels. Currently, this self-assessment instrument is being validated through workshops (hosted by NGOConnectAfrica) and focus groups. Additional resources will

be made available to assist the organisations with their transitions to the next higher maturity levels.

The purpose of this paper is to share the tool with fellow researchers to solicit their critical contribution in improving the toolkit and solicit their help in building and distributing the toolkit. Even though the instrument has still got a few warts and needs some work, it is already considered to be a valuable tool for NGOs wishing to embark on a journey of using ICTs to improve their effectiveness and efficiency. It is our belief that it will make a valuable contribution in the real world – perhaps much more so than a lot of the rather more academic if not esoteric research which is often done within the “ivory tower” confines of academic institutions.

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Appendix:

A Selection from the Self-Assessment Instrument : example of the initial draft text version converted into a more user-friendly interface with checklist and action items.

<p>Internet & Telecoms infrastructure</p>	<p>The biggest but, in Africa, typically also the most difficult and expensive ICT infrastructural payoff comes from having access to the Internet. Being able to communicate electronically with stakeholders and similar organisations as well as being able to tap into the wealth of useful information available on the internet is often the ultimate payback and business enabler of ICT investments. However, this is also the area where NGOs in Africa experience the so-called digital divide most acutely. Internet access is typically much more expensive in Africa than anywhere else in the world. Even more problematic is that many rural areas simply do not have ANY affordable Internet access options. Luckily many cell phone companies are now providing a wireless/mobile internet option which may be affordable for low-bandwidth applications. Currently heavy investments are being made to give the continent as a whole much more and cheaper access to the Internet by dramatically increasing undersea cable capacity. Finally, there are also some exciting moves to provide affordable satellite internet access in the medium term.</p>			
<p>Questions</p> <p>How do you connect to the internet?</p> <ul style="list-style-type: none"> <input type="checkbox"/> We do not have access to email or the Internet (level 1) <input type="checkbox"/> We try to buy a copy of the Internet but apparently it does not fit on our computer ☺ (level 1) <input type="checkbox"/> We use a fixed telephone line dial-up connection using a modem (level 2) <input type="checkbox"/> We have an ISDN line (level 3) <input type="checkbox"/> We have a DSL connection (e.g. 	<p>Level 1: Non-existent or basic</p> <p>Your organisation is not linked to the internet. Some staff make occasional use of a publicly available Internet facilities (library, computer centre, internet café) for personal purposes and, sometimes, use their personal (home) internet facilities for organisational purposes.</p>	<p>Level 2: Early Stages</p> <p>The organisation has non-permanent low-bandwidth internet access from one PC or a reasonably advanced mobile phone, or by means of an account with a local internet cafe. Typically this is by means of a dial-up modem or possibly a wireless GPRS-enabled mobile phone. The limited bandwidth is used for email and some directed web-browsing. Internet access is limited to one or a few key staff members, who typically have at most one/very few relatively short internet</p>	<p>Level 3: Intermediate</p> <p>Your organisation has a permanent internet link, normally using a broadband access method, or, in the case of a remote rural NGO, at least a semi-permanent connection to the internet. Via the LAN, a fair number of the network computers are this internet access, though some types of internet traffic may be blocked. A firewall has been installed for secure incoming traffic but possibly also to restrict certain types of outgoing</p>	<p>Level 4: Advanced</p> <p>The organisation has a sophisticated and high bandwidth internet connection, normally ADSL or 3G wireless. Ideally there is a backup option of either using two internet service providers (ISPs) or of having an emergency dial-up modem or wireless connection. The NGO monitors its bandwidth utilization and possibly implements packet shaping and traffic prioritization. It uses a caching/proxy server.</p>

<p>ADSL) (level 3)</p> <ul style="list-style-type: none"> <input type="checkbox"/> We have a dedicated leased data line (level 4) <input type="checkbox"/> I use a mobile connection eg GPRS (level 1) or 3G (level 2) <input type="checkbox"/> Other e.g. WiMax or satellite (level 3) 		sessions per day.	traffic.	Large organisations have an own mail server and web server.
	<p>Move to the Next Level</p> <p>Compare the availability, the pricing and the performance of a fixed telephone line dial-up with a fixed line DSL connection/any wireless options that are available (2.5G or 3G). Unfortunately, in many areas across Africa, especially in rural areas, you may have no or only one option (but check carefully with your cell phone providers). In fact, in some areas the only viable option may even be an expensive satellite connection though there are moves underfoot to make this a much more viable option. [...]</p> <p>Collect some information on Internet Service Providers (ISPs) and check how much does the initial connection (installation) cost, what is the monthly subscription fee and how much data can you download, do you get email addresses (and how many) and web space (good for a temporary or trial NGO website), what type of support is available, do they provide the modem (to connect to the internet), is there a minimum contract period? It is often worthwhile to pay a little extra for an ISP</p>	<p>Move to the Next Level</p> <p>When moving up to a permanent internet connection with access from multiple computers, it is useful to conduct an informal user needs analysis within the organisation to assess which users need email and internet access and their anticipated bandwidth requirements. Sending text email, small documents, occasional faxes and text-only or low-graphics websites requires relatively little bandwidth. But large documents and multi-media downloads such as voice, music, video, streaming media or VOIP will have high bandwidth requirements.</p> <p>Investigate the various local options available for internet which typically range from dial-up modem, ISDN, ADSL, or wireless 2.5G/3G (not all of these may be available across Africa and in rural areas). The key selection criteria should be monthly subscription cost, ISP reliability, quality of telephonic customer support and</p>	<p>Move to the Next Level</p> <p>Moving to a high-bandwidth internet connection requires a careful and formal analysis of current and future bandwidth requirements. This is typically based on historical use patterns but it is surprising how easily available bandwidth capacity is used up. Thus a careful financial costing exercise is also necessary. Rural and small NGOs are unlikely to need to move to the next level.</p>	

	which has a proven track record and accessible support help lines. In a metropolitan area you may be able to obtain a reasonably priced ADSL connection and move straight up to level 3.	contract lock-in period. Also check that your ISP will provide you with a number of email accounts since one single account is likely to be insufficient for an NGO.	
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Internet/Telecoms infrastructure

The biggest but, in Africa, typically also **the most difficult and expensive ICT infrastructural payoff comes from having access to the Internet**. Being able to communicate electronically with stakeholders and similar organisations as well as being able to tap into the wealth of useful information available on the Internet is often the ultimate payback and operational enabler of ICT investments. However, this is also the area where NGOs in Africa experience the so-called digital divide most acutely.

Internet access is typically much **more expensive in Africa than anywhere else in the world** – in the order of up to **100 times** what it is in Asia or the US. Even more problematic is that **many rural areas simply do not have ANY affordable Internet access options**. Luckily more and more cell phone companies are providing a wireless internet option which may be affordable for low-bandwidth applications. Currently heavy investments are being made to give the continent as a whole much more and cheaper access to the Internet by dramatically increasing undersea cable capacity. Finally, there are also some exciting moves to provide affordable satellite internet access in the medium term.



Question: How do you connect to the internet?
(tick all that apply)

Answers/Scenarios	Level	✓
We do not have direct access to email or the Internet from within the organisation	1	
We tried to buy a copy of the Internet but apparently it does not fit on our computer ²	1	
We use a fixed telephone line dial-up connection using a modem	2	
We have an ISDN line	3	
We have a DSL connection (e.g. ADSL)	3	
We have a dedicated leased data line	4	
I use a mobile connection e.g. GPRS (level 1) or 3G	2	
Other e.g. WiMax or satellite	3	

[...]

Note

- It is often worthwhile to pay a little extra for an ISP which has a proven track record and accessible support help lines.
- Support is expensive for ISPs to provide and the cheaper ISPs often skimp on support since this may be quite invisible when newcomers choose between an ISP.



Level 2: Early Stages

Description	Yes	No
The organisation has non-permanent low-bandwidth Internet access from one computer or a reasonably advanced mobile phone, or by means of an account with a nearby and easily accessible internet cafe.		
Typically this is by means of a dial-up modem although a wireless GPRS-enabled mobile phone can also be used. The limited bandwidth is used to down/upload email and do some directed web-browsing.		
Internet access is limited to one or a few key staff members who typically have at most one (or very few) relatively short internet sessions per day.		



Move to the Next Level

When moving up to a permanent Internet connection with access from multiple computers it is useful to:

Actions	Not possible (give a reason why)	Possible (tick where applicable)		
		Short term	Medium term	Long term
Conduct an informal user needs analysis within the organisation to assess which users need email and internet access and their anticipated bandwidth requirements.				
Investigate the various local options available for internet which typically range from: <ul style="list-style-type: none"> • dial-up modem • ISDN • ADSL • Wireless 2.5G/3G (not all of these may be available across Africa and in rural areas). 				