Zenzeleni

Do It For Yourselves

An Introduction to Community Telecommunications Networks

BANG
Bridging Application and Network Gaps

UNIVERSITY of the
WESTERN CAPE

RIGHT2KNOW

www.Zenzeleni.Net

Zenzeleni
Do It For Yourselves

An Introduction to Community Telecommunications Networks

Glossary:

The following words used in this booklet are defined here.

Cellular: In this context, wireless/radio networks of beacons/masts serving a large area ("cell") around themselves. Mobile devices like cellphones automatically connect to the best available signal, and switch from one cell to the next while travelling.

Communication: Information transfer between people and/or machines.

Data: Information in a form that can be understood. Here it refers to digital data used by computers/smartphones.

Digital: Involving bits of information rather than patterns such as waves. Digital data is easier/quicker to transmit than other kinds.

ICASA: Independent Communications Authority of S.A.; government-appointed regulatory board.

Internet: The global network of digital networks which is central to the world economy and people's participation in public life.

ISP (internet service provider): a company or organisation which connects users to the internet, through landlines and/or wireless networks. Cellphone companies also act as ISPs.

Network: An arrangement of equipment in various places, able to communicate between those places, either by landline or radio.

Telecommunications ("telecoms"): Electronic communication over distance, including radio, TV, telephone (landline and cellular), and internet (landline, cellular and wireless).

Introduction

Language and communication are a large part of being human and in South Africa as in other places, the struggle for human rights has included a struggle against control of communication. Once rights are achieved on paper, there is still a struggle to make them a reality for everyone.

The shift from the 20th century era of mass broadcasts to the 21st century era of mass two-way digital communication is happening. The state and big business built their power with broadcasting and are doing what they can to continue this online. But the internet makes everyone a potential politician, journalist or publisher. This threatens the elite's control of communications and sets the scene for a new struggle - for the internet itself.

The migration of South African television to digital broadcasting was an opportunity to bring the internet to the masses at a reasonable cost, but the government chose to prioritise 20th-century-style one-way communication.

The mobile telecommunications sector is in the grip of a cartel which keeps decent internet access priced too high for most South Africans, so it's up to us to find ways of making it more affordable. This booklet is about doing just that.

The Legal & Regulatory Situation

a) Human Rights:
The International Declaration of Human Rights recognises the right to freedom of expression and communication.

b) Citizens' Rights:
The Bill of Rights is a prefix of our 1995 constitution, and its Chapter 2, section 14 states that everyone has the right to privacy, which includes the right not to have—
    (a) their person or home searched;
    (b) their property searched;
    (c) their possessions seized; or
    (d) the privacy of their communications infringed.

Section 16. (1) states: everyone has the right to freedom of expression, which includes—

(a) freedom of the press and other media;

(b) freedom to receive or impart information or ideas;

(c) freedom of artistic creativity; and

(d) academic freedom and freedom of scientific research.

Section 16. (2) specifies exceptions such as incitement of violence.

Section 32. (1) states that everyone has the right of access to—

(a) any information held by the state; and

(b) any information that is held by another person and that is required for the exercise or protection of any rights.

Section 32. (2) National legislation must be enacted to give effect to this right, and may provide for reasonable measures to alleviate the administrative and financial burden on the state.

The national legislation referred to was indeed enacted - the Promotion of Access to Information Act ("PAIA"). On paper it is reasonably satisfactory but in practice, most requests for information under PAIA are ignored! The struggle continues, indeed.

Comment: In a context where so much official business is conducted online, and where news is increasingly sourced online, the simple right of citizens to participate in public life requires government to guarantee them internet access; this cannot be left to the market.The government acknowledged this by creating the Universal Service & Access Agency of S.A. (USAASA) which collects fees from telecoms operators and is tasked to invest in citizens' telecommunication opportunities. It seems as if much of this money is going to be used to sponsor set-top boxes as we migrate to digital TV.

c) Communications Regulation:
Under South African law, electronic communication of all kinds is regulated by ICASA. The government appoints commissioners to serve on the board of ICASA. According to its mission statement it "aims to ensure that

all South Africans have access to a wide range of high quality communication services at affordable prices".

Anyone wishing to provide broadcast, telephone or internet services to the public must register with ICASA and either receive a licence, or an exemption from licensing (in the case of non-profit organisations). In addition, the use of technology which uses spectrum (radio waves) must be approved by ICASA.

In some countries, regulators have used their power to promote competition among telecoms operators to the point where phone calls and data are very cheap. India is a good example of this. Some say this is because it has such a huge population, but on the other hand African countries with smaller populations than South Africa's, such as Kenya and Namibia, also have cheaper communications than we do.

Although, after many public protests, ICASA has taken steps in recent years to reduce communication costs, it hasn't done as much as it should, and probably won't unless forced to, because the government and powerful individuals get income from the high profits of telecoms companies.

d) Co-operatives (co-ops):
These are legally recognised and supported as non-profit enterprises by the Department of Trade & Industry. They register and submit a constitution, minutes of Annual General Meetings (AGMs) and so on. Small, medium and micro-enterprises are high on the government's stated priority list for economic development.

The information and communication technology (ICT) sector is one where this is most urgent. In many countries official support for rural telecoms co-ops has helped reduce the gap in communication opportunities between "haves" and "have-nots".

There are various ways co-ops can get help from the government: financial and organisational support are offered by the DTI via SEDAs (Small Enterprise Development Agencies) and "Incubators" (see "*Resources*" at

the end of this booklet).

The Struggle for Affordable Communication

In the early years of digital communication in South Africa, it was only used by rich people and organisations. Both equipment and data (including voice calls) were very expensive. The licences given to cellular companies by ICASA specified that they had to extend their networks even to areas where the demand was low, either because of low population or because of poverty.

The previously state-owned Telkom was semi-privatised, but ICASA allowed it to keep its monopoly on landlines on condition it extended its network to the same low-demand areas.

ICASA failed to enforce these licence requirements. However, after protests from business and civil society, it eventually took certain steps to make digital communications more affordable:

• Cellular companies were banned from locking phones to their networks. Nowadays you can put any SIM in any phone.
• Cellular companies were forced to allow customers to keep their numbers when they migrated to another company.
• The "termination fee" charged by a cellular company to allow one of its customers to receive a call from another network was reduced.

However prices are still too high and certain demands from civil society such as the R2K Campaign have still to be met. For example, that airtime, once loaded, should not expire.

Positive changes in the world market have trickled into South Africa, for example cheaper smartphones and widespread free WiFi hotspots. These trends are continuing, but the struggle continues.

Zenzeleni: "Do it for yourselves!"

In 2012 researchers from the

University of the Western Cape (UWC) started to work with the people of Mankosi Tribal Authority in the Eastern Cape. After discovering that in this very poor community, people were spending a lot on cellphone airtime, they proposed that the community create their own telecoms network.

They suggested the use of mesh networking, where instead of expensive central beacons, small cheap devices called Mesh Potatoes would be placed in certain households, which could all communicate with each other.

At a community meeting called by the inkosi, the concept was explained and accepted. A committee was elected and the name Zenzeleni chosen. Certain households were identified to host "base stations" or nodes in the network. Each node's signal only reaches the nearby nodes, but data can step through many nodes to reach the whole mesh.

The committee, in consultation with the researchers, began the paperwork necessary to open a bank account, register as a co-op and obtain the necessary licenses & exemptions from ICASA. As a co-op, the project belongs to its users/members.

At the same time, the research team began training the community members chosen from the households which host base stations. They learned to fit the aerials, with solar panels and Mesh Potatoes to the roofs of the houses, and to make wooden boxes to hold the batteries. Right away community members were able to start calling anywhere in Mankosi, for now with the land-line-type phones at each station, but eventually using WiFi and smartphones. The committee had decided to keep these calls free, but to make people pay to charge their phones at the base stations.
Besides communal phones, Zenzeleni provides internet at low cost to the local school, small businesses and NGOs - a major developmental improvement whose effects will show in future.

Once the co-op was legally registered, it was able to do business with a Voice over Internet Protocol company which places calls to other networks (cellular or

landline) for 17% of the normal cost, but the co-op charges users 50% of the normal price, so as to fund itself. The billing uses voice menus in IsiXhosa - when you own the system, you get to decide how you want your service provided to you.

The researchers found that many people continue to use their cellphones to call other networks directly, even though it costs twice as much. Probably once people can make calls on WiFi with their own phones, they will. Smartphone users will get cheap data bundles, and schools, businesses and NGOs in the area will also get cheaper Internet.

Further into the future, Zenzeleni may be able to issue its own SIM cards, so that users can dial directly. Hopefully this will also enable them to make "roaming" calls while outside of Mankosi. By solving its own problems, Zenzeleni is making things easier for future networks like it. However each situation will have its own problems too. Firstly, the equipment costs at Zenzeleni were sponsored by UWC until Zenzeleni repays them. In other

cases; a plan must be made to finance the initial investment.

A legal co-op can apply to a funder or for a bank loan. However, forming a stable co-op might be difficult in some situations. At Mankosi the Tribal Authority was able to call everyone together in a way that could be difficult in, for example, an urban situation. So the first challenge in building our own networks is to organise ourselves.

Because a community network needs its users to be in a certain area, this is the first thing to organise. Once you have a group of motivated members, check out the Zenzeleni website (see Resources) or contact your nearest office of the Right2Know campaign.

Post-script:

In mid-2015, the committee of the Zenzeleni co-op took a decision to change its name to Zenzeleni Networks Mankosi, in the expectation that other projects will unite under the name Zenzeleni and DO IT FOR YOURSELVES!

Resources

- http://zenzeleni.net/ Much more from the Zenzeleni network
- http://villagetelco.org/ The people who brought us the Mesh Potato
- http://rhizomatica.org/ Pioneering Mexican organisation co-ordinating community networks.
- Department of Trade & Industry: 0861843384 contactus@thedti.gov.za
- http://www.dti.gov.za/sme_development/sme_incentive.jsp?id=11&subthemeid=8 DTI funding for co-ops
- http://www.dti.gov.za/sme_development/inst_support.jsp D.T.I. institutional support for co-ops
- R2K's Right to Communicate booklet (hard copies free at offices): www.r2k.org.za/internetactivism
- R2K's analysis of the cost of communictions for low-income South Africans (hard copies free at offices): www.r2k.org.za/livedcosts
- R2K's analysis of communications policy options for South Africa (hard copies free at offices): www.r2k.org.za/telecomalternatives

Contact the Right2Know

Gauteng:
Ntombiyebongo Tshabalala
ntombi@r2k.org.xa
078 594 8962

Western Cape:
Vainola Makan
vainola@r2k.org.za
021 447 1000

KwaZulu-Natal:
Joanne Adams
joanne@r2k.org.za
083 498 1583

Other Provinces:
Bongani Xezwi
bongani@r2k.org.za
073 904 1626

Zenzeleni

Do It For Yourselves

BANG
Bridging Application and Network Gaps

UNIVERSITY of the WESTERN CAPE

RIGHT2KNOW

www.Zenzeleni.Net

with the support of CONFINE