

Impact of ict on country development



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Executive Summary

In this presentation we give advice to the Government of Malambia, a least developed country with a GDP per capita of US\$480 and whose population of 39 million people majority of whom live in the rural areas. In the capital city, a monopoly network of fixed telephones under the direct control of the Ministry of Posts and Telecommunications, has reached only 9% out of over 5 million. The rural areas have a teledensity of 0.25%. This advice includes how the country, which has recently discovered a huge source of oil in an undeveloped location 100 kilometres from the capital to a prosperous ICT driven country.

This advice is laid out in National strategy for communications development in a chronological order beginning with justification to break monopoly and need for competition policy in Malambia. It shows the legal requirements and explains the privatised commercial environment. In the next chapter the proposed establishment of a national regulatory authority is discussed showing: types of regulatory bodies, the role of regulatory authority which will include among others; monitoring use of frequency spectrum, approval of communication equipment, Management frequency spectrum, protection of consumers, licensing and pricing of telecommunications operators, managing Internet protocol addresses and number portability and Universal access, frequency planning and policy, and Interconnectivity,

Under the same chapter we discuss possible structure regulatory body, the needed rules and regulation, the Legal, requirements for the regulatory authority, its independence and structure of the regulatory authority.

In the next chapter we examine rolling-out ICT coverage in Malambia and we look at, Internet service provision, Connectivity of broadband, Introduction of VOIP services, Oil and its impact on ICT development and strategies for ICT expansion strategies. In the next chapter we propose radical proposals for network interconnectivity with emphasis on; general agreements on interconnectivity, requirements for smooth interconnectivity, interconnection services, handling interconnectivity disputes and interconnection billing and charges

In the next chapter, we examine the likely impact of new ICT services for a rapid economic growth in terms of new technologies, new services in transformation of socio-economy, converged ICT services and give examples.

Finally we make recommendations which we believe will be useful and urge policy makers in Malambia to examine them and apply them.

Preamble

At the end of 2009, over 145 Regulatory Bodies were identified as being in place worldwide but Malambia currently doesn't have one. The Telecommunications industry in Malambia is still in monopolistic environment with the incumbent only telecommunication network offering fixed telephone services under the control of the Ministry of Posts and Telecommunications.

Luckily for the people of Malambia a huge source of oil was discovered recently in an undeveloped location 100 kilometres from the capital. One expert estimates this oil to produce revenue by 2015.

The discussion in this paper is advice to the government of Malambia on how the country can transform itself from its current lowly developmental status with emphasis on telecommunications in its many forms. Specifically the paper will discuss the following:

- A national strategy for communications development
- A description of the proposed regulatory structure
- Suggestions as to how the coverage level of the population can achieve 65% by 2015
- Radical proposals on network interconnection
- New services that will assist with transforming the countries economy

It is suggested that the government and people of Malambia give the proposed changes support through the legislature and the different processes to achieve the transformation in telecommunications that will give the country the impetus to economic and social progress in the modern era of communications.

National Strategy For Communications Development

The Need To Break Monopoly

The liberalisation is the opening of a monopolistic market to competitive provision of facilities and services removal of legal constraints which prevent communication service providers from entering markets and providing competitive services. Market liberalisation seeks to remove administrative and regulatory encumbrances that are related to business start-up, operation, trade, payment of taxes, closure and capital flows and profit repatriation by reducing the time and cost associated with various government and other requirements (Canto 2010: 1).

Malambia needs to liberalise the telecommunications sector to make change to previous legal restrictions in telecommunications policy and come up with a new Communication laws, the creation of a Communication Regulatory Authority, the streamlining of national policy to international standards, and the preparation of policy for investment and business control. In most World Trade Organisation (WTO) member countries, liberalisation has come to mean the opening of a monopolistic market to competitive provision of facilities and services, whether the former monopoly operator is a state enterprise or a private enterprise (World Bank, 2006).

Justification For A Competition Policy In Malambia

“ A monopoly granted either to an individual or to a trading company has the same effect as a secret in trade or manufactures. The monopolists, by keeping the market constantly under-stocked, by never fully supplying the effectual demand, sell their commodities much above the natural price, and raise their emoluments, whether they consist in wages or profit, greatly above their natural rate. (Smith 1776)

ICT reforms in Malambia should geared towards breaking the monopolistic government owned telecommunications company and allow many operators to compete for service delivery. Competition helps the country in many ways such as; competitive prices as consumers can choose the company of their choice, introduction of different products and services and innovations. As competition among service providers increases more customers are brought into the business bracket and therefore the government gets more taxes which are used to develop other sectors of the economy. With prospects for

oil revenues many international telecommunications companies will come to Malambia only if the telecommunications environment is liberalised.

Legal Requirements

In short, competition policy in Malambia will encourage efficiency, optimum allocation of resources and technical advancement but this will need to be secured by law. First, the single most important factor to successful privatisation or liberalisation is clear government goals for the telecom sector and the adoption of policies to achieve those goals. Second, one critical issue for successful liberalisation is an open and transparent regulation. The WTO agreement requires that the regulator be independent of state operator, as this allows accountability, transparency and equity (Canto 2010: 5).

Malambian government will therefore need to prepare an anti-monopoly Bill that will be discussed and forwarded to the Parliament to be signed as an act of Parliament and then by the president into law. Modern competition law has historically evolved on a country level to promote and maintain competition in markets principally within the territorial boundaries of nation-states. National competition law usually does not cover activity beyond territorial borders unless it has significant effects at nation-state level (Martyn 2006: 1). When protected by law most international companies feel secure to invest in a country and Malambia will not be exceptional.

The Privatised Commercial Environment

An environment in which it is possible to establish a company with a number of shareholders under a legal name and trade mark is referred to as a commercial environment. Privatisation is the transfer of assets or service

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delivery from the Government agencies to individuals or groups of individuals. The transfer be exclusive to the operation, management or total ownership of formerly government owned entities. Privatisation of Malambia ICT services will bring about numerous benefits such as better and diversified products and services, cheaper services as there will not be price fixing, innovations in products and service delivery in order for companies to get or retain clients, wider coverage as competing firms search for clients and of course more revenues to the government in terms of taxes.

A privatised environment calls for private investors to invest their capital in companies as companies need to use the capital to upgrade their hardware, invest in new technologies and acquire the essentials for the companies to because there are no government subsidies to use. Private investors want to make sure there will be returns on their investments and will make sure there is fair-play, a level playing field and security for their investments. Fair-play among the different operators is ensured by a regulatory body that monitors and evaluates how the operators follow and abide by the rules, regulations and laws in place.

Proposed Establishment Of Malambia Regulatory Authority

In order to enforce the application and use of the communication laws, rules and regulations in the liberalised market, attract regional and international investors and protect consumers from cartels and overpricing through collusion in ICT sector in Malambia, there is need to set up an Independent Communications Regulatory Authority to ensure a smooth transition from a single government operator to multi-operators in the ICT sector.

Malambia should use the regulatory body to:

- create and deliver fair, accessible, faster and modern service to consumers;
- allow access to a wide range of communications services;
- attract regional/international investors;
- put in place reasonable prices and quality of communication services;
- protect consumers from high tariffs;
- allow smooth coexistence of different operators;
- ensure the independence for policy-makers and operators.

Types Of Regulatory Bodies

There are different types of regulatory bodies: a single-sector regulator, a converged institutional design, a multi-sector regulatory authority like the Rwanda Utilities Regulatory Agency (RURA) and a non specific telecommunications regulatory authority (ICT regulation toolkit 2010):

It is recommended that converged institutional design which refers to regulatory bodies that oversee a range of services which include telecommunications, information and communications technologies and broadcasting, will be best suitable for Malambia considering the fact that it will be changing from a one operator monopoly type of market, bearing in mind the availability of resources especially human resources.

The Role Of Regulatory Authority In Malambia

In discussing the role of the regulatory body in Malambia emphasis is placed on its role in the privatised and liberalised telecommunication sector. Other

sector may be considered by the policy makers. The regulatory body should have the following policy principles:

- a. Always make consultations with all stakeholders and evaluate the possible impact of their action prior to imposing regulations actors in the sectors.
- b. Make research on markets always and remain abreast with technological understanding.
- c. Avoid intervention, but do so promptly, effectively and firmly when required.
- d. Ensure interventions that are proportionate, consistent, transparent, accountable and which is based on evidence when investigating and implementing the resolutions.
- e. Where specific statutory duty to work calls for it, Intervene for a public policy and goal which cannot be achieved by markets.
- f. With stated policy objectives, regulate and articulate publicly discussed annual plan.
- g. In regulatory matters, seek less intrusion to attain its stated policy objectives.

Monitoring Use Of Frequency Spectrum

This refers to the support and supervision of the operation of communication networks and stations according to the legislation. This will allow economical and sustainable provision of communication services to their customers by identifying transmitter, monitor compliance with regulations and whether the

transmission meet the specified technical requirements. This will prevent unlicensed and defective transmitters from interfering with legally permitted transmitters.

Approval Of Communication Equipment

The Regulatory Authority ensures that all communication equipment entering the country conform to acceptable national, regional and international standards to ensure the quality and safety of users. It will ensure quality of services provided by operators, safety and compatibility among the different users. In this regard the regulatory authority will ensure that the quality Malambians is above reproach and is acceptable.

Management Frequency Spectrum

There is need to set up a clear policy on frequency spectrum management to ensure a rational, efficient and economic use of frequencies. This should be by virtue of existing legal and regulatory framework that governs ICT in the country and applied by the Regulatory Authority. The frequency spectrum may cover three sections which are frequency assignment, frequency spectrum monitoring and frequency spectrum enforcement.

Protection Of Consumers

Communication licenses include conditions that protect the consumers such as billing practices, dispute resolution, consumer complaint mechanisms, price regulation, emergency services, and mandatory services to consumers and limitations of liability for service defaults. The Regulatory Authority should make and publicise a code of conduct for service providers showing the required behaviour, duties and responsibilities in ICT sector. Consumers should be protected from excessive prices, poor service delivery and

unreliable service provision such as poor lines or intermittent telephone lines.

Licensing And Pricing Of Telecommunications Operators

The legal framework should empower the Regulatory Authority to receive and process applications for communication licenses, monitor the pricing, arbitrate disputes and interconnectivity between the different communications providers, if requirements are met. Operators' licenses are normally issued through open tender to allow equal opportunities to the bidders and get the best offers from operators in the communication service providers.

Internet Protocol Addresses And Number Portability

Regulatory Authorities are responsible for developing national numbering plans in conformity with international standards bearing in mind the need to synchronise with regional and international norms. Regulatory Authority in Malambia shall set these numbers in tandem with the recommendations of the Internet Corporation for Assigned Names and Numbers (ICANN), telephone numbering plan and the International Telecommunication Union (ITU). The Regulator will put in place the numbering system bearing mind the international standards and regional norms. The Regulator will also set requirements and registrars which must be met an entity to be licensed for IP address.

Universal Access

Universal access refers to the ability of all people to have equal opportunity and access to a service or product from which they can benefit, regardless of their social class, ethnicity, ancestry or physical disabilities. There should be

a clause in each operator's license obliging them not to discriminate certain areas because they are remote, poor or inaccessible and the regulator should monitor their implementation by ensure ICT services are spread according to the universal access principles in order to connect remote area so that each all people of can be provided with the benefits. The Regulatory Authority should also manage the Universal Access Funds and collect revenue from various sources, which targeted subsidies to implement universal programs. These funds shall be administered independently.

Frequency Planning And Policy

Regulatory Authority for an efficient development of implementation policies and plans relating to should plan and put in place policies for the spectrum utilisation. It is possible to use frequencies generate incomes and jobs with proper planning and management.

Proposal Of Regulatory Structure In Malambia

A regulatory Authority should be established in Malambia to ensure that ICT sector is regulated and that consumers are protected from unfair and get the service they pay for. There needs to be in place an affective Regulatory Authority to ensure credibility to ensure continued entry into the market and compliance with and enforcement of existing regulations.

The authority shall issue Individual licenses delivery, monitor compliance to the rules and regulations, avoid cartels and anticompetitive tendencies on part of providers, ensure quality of service and ensure users are not cheated through high charges above the market prices.

Putting In Rules And Regulation

As indicated in the preamble, the current single fixed-line provider in Malambia is a government Institution under the ministry of Posts and Telecommunications. The current law cannot serve the commercial environment envisaged in the country. There is need to change the law and consequently, a regulatory authority and its independence. This calls for the following: making new policies and regulations that regulate network operation, frequency, numbers, IP addresses, liaise with regional and international organisations and manage disputes.

Legal Framework

Countries develop and adopt different laws and legal system depending on the local situations and the interests of those that make laws; the development of the Malambia regulatory framework, rules, laws, and regulations that identify contractual obligations and property rights of government and stakeholders must be developed basing on the local conditions while adopting best international norms and values.

Requirements For The Regulatory Authority

The Regulatory Authority in Malambia should incorporate International standards used and applied throughout the world. This will require the Regulatory Authority should ensure its independence, predictability, transparency, accountability, and capacity.

Independence Of The Regulatory Authority

The Regulatory Authority should be separate and independent in operation and strategic terms from the government agencies and the Ministry of Post and Telecommunications so that it can carry out its duties without undue

influence from the government control. This will give operators and the public confidence in the neutrality of its decisions and will attract investors.

Structure Of The Regulatory Authority

Under the supervision of the Director General, the Regulatory body should have the department shown below:

- Spectrum and International Department
- Legal Affairs
- Licensing & E-Commerce
- Technology Development Department
- Regulatory Affairs
- Finance
- Support Services
- Corporate Communications

Rolling-Out Ict Coverage

This chapter examines the possibility of widen the coverage of ICT throughout Malambia. It is expected that with increased revenue from the discovered oil more investment opportunities will attract even more investors. But with or without oil the country should start planning for the rollout through private investments. There is no doubt that ICT development is an engine in increasing the awareness of nationals and their role in development, education sector and competitiveness. The growth in the use of ICT in society should benefit the country in many forms; commerce and banking through e-banking and e-commerce, faster and cheap communication, through e-education, e-health and telemedicine.

Internet Service Provision

The role of the Internet in increasing the efficiency of economies in different countries as well as fastening and easing communication and thereby raising countries' economies and consequently GDP cannot be overemphasised.

Internet provision as a solution in developing and reaching undeveloped or underdeveloped areas has been successful in many poor countries including while increasing revenues both at national and individual levels among the population and Malambia should be no exception. Issuing licences to multi-operator Internet Services Providers (ISP) in Malambia will reduce the price of connectivity while promoting competition among players.

Connectivity Of Broadband

Leased line prices are high in many developing countries which operate under monopolistic single provider marketplaces. The Internet broadband connectivity and wireless mobile telephone reduce the cost of communication. The aim should be to increase Internet penetration, promote investment in wireless connectivity, and urge landline operators to deliver reliable services through leased lines and improve the quality of overall services provided.

Introduction Of VoIP Services

The Voice over Internet Protocol (VoIP) greatly reduces the cost of telephone calls and many operators around the world are using this to carry their international traffics. The Regulatory Authority will decide whether to licence this medium of communication bearing in mind the views of telephone operators as the use of VoIP may impact their profitability. The Regulator shall then decide how the two media can coexist and whether will be

forfeited at the expense of the other. The decision of the Regulator should be independent from any external influence whether government or otherwise.

Oil And Its Impact On Ict Development

According to an expert from Texas, in the USA, the discovered oil reserves in Malambia, ‘...will produce revenues by 2015”. Bearing in mind that the current Malambian GDP per capita is US\$480, there is possibility that peoples’ incomes will rise while the government revenues will increase multi-fold. This will avail the resources needed resources to put in place the necessary infrastructure while increasing peoples’ disposable incomes through job creation and other horizontal synergies related to the oil industry and therefore their ability to demand and pay for services.

Oil has many products such as: aviation fuels, petrol, kerosene, diesel, LPG, lubricating oils and bitumen. All these products will be used for different purpose to enhance the living standards, purchasing power, and lifestyle of Malambians hence the need to for improved quality of service in ICT.

With a population 39 million whose incomes and the standard of living are improved the purchasing power will be a magnet to international investors in the ICT sector.

Ict Expansion Strategies

The expansion of ICT services in a liberalised economy is the responsibility of service providers, who according to the terms of licences they bided for, follow the clause stipulating spreading their services to cover the entire nation without overlooking areas because of the geography, remoteness or development.

The Regulatory Authority will ensure that those terms are followed and no areas of the country are excluded. This will ensure that Malambians of all walks can access the ICT services.

To attain the expansion of ICT coverage in Malambia there will be need for train of people to help others in the use of the different ICT applications. For example groups of people should be trained to help the majority of Malambians who cannot access and use the internet in “ Internet Cafes”.

Universal access, for instance using the Universal Access Fund, should be used to fund and make improvements in service delivery in Malambia particularly areas that are under serviced or people are illiterate to train peers who will in turn train others.

Radical Proposals For Network Interconnectivity

Introduction

The Regulatory Authority in Malambia will define the rules of interconnection and also establish the rules by which the former monopolist interacts with the other new operators. Where there is fair-play Malambia will attract investors. The Regulator must allow the new ICT Operators to recover their investments through a pre-determined exclusive period.

General Agreements On Interconnectivity

The agreement is be based on what type of service is provided by providers namely fixed to fixed phone network, mobile to mobile phone network, fixed to mobile phone network, mobile to fixed phone network, and ISP to mobile or fixed phone network.

It is possible for two or more networks to exchange traffic and inputs in legally referred to as interconnectivity and this should be facilitated by law. The Regulatory Authority put in place principles of connectivity and makes them known. Agreement among operators regarding interconnectivity should be forwarded to Regulatory Authority together with interconnection fees. The Regulator will then monitor the implementation, competition and intervene when necessary. Interconnection is non-discriminatory and an operator should not enter into agreement with another operator for interconnection fees different from the ones published by the regulatory authority.

Whereas monitoring domestic interconnectivity within the country is easy and beneficial to the service providers, the regulatory body should find modalities for easing international interconnectivity between Malambia and other countries' networks for the Malambians who call or receive international calls. This may be achieved by reaching agreements and understandings with regulatory bodies of other countries or using the WTO regulations.

Requirements For Smooth Interconnectivity

- Connectivity is based on the principles transparency and non-discrimination;
- Agreement on interconnectivity should involve willing parties;
- The acceptable standard of quality of networks should be agreed on;
- Adequate capacity for interconnectivity should be provided by operators;
- The cost of interconnectivity should be agreed on prior to interconnecting;

- Technical matters and international standards on interconnectivity between Network providers should be agreed on;
- Dispute between and among interconnected parties should be resolved by Regulator.

Interconnection Services

- National and International Call Termination; also known as voice termination, refers to the handing off or routing of telephone calls from one telephone company, also known as a carrier or provider, to another. The terminating point is the called party or end point. The originating point is the calling party who initiates the call.
- National and International Call Transit/ Roaming;
- Indirect Access Services; Refers to the access that a subscriber whose service is directly connected to the network of one carrier may have to the services provided by another carrier or service provider (Ovum 2003)

Source : Byung W. Kim, Chang Y. Choo, Seong H. Seol (n. d.) Economic Effects of Indirect Access Regime in the Mobile Telecommunication Market [online] available from [1 April 2010]

Other services the Regulatory Authority must take care in interconnectivity are:

- Physical Interconnection;
- Access to the Information on the Operator and Directory Enquiries;
- Access to Emergency Services;
- Additional services (Premium Rate and Free Phone services);
- Co-location.

Handling Interconnectivity Disputes

The Regulatory Authority should resolve disputes among operators through negotiations and application of the standards and laws. There should be room for negotiations before cases are taken to the Regulatory Authority. Operators should not abuse consumer rights and the Regulator should apply the law where it occurs. Parties that are not happy with resolutions of the Regulatory body may appeal to the courts of law.

Interconnection Billing And Charges

Interconnectivity bills and charges may be done several ways such as:

- Parties can make their own reconciliation,
- Bills may be exchanged within an agreed period of time at the end of a billing period ;
- Exchanging invoices after reconciliation;
- Interconnectivity agreements should indicate the currency of payment whether local currency or international;
- Payment agreements should stipulate the payment after receipt of invoices.
- It common practice that providers pay a certain amount amongst themselves for calls.

Impact Of New Ict Services For A Rapid Economic Growth

Introduction

When innovative technologies, ICT services and improved technologies are initiated in Malambia, the national economy will be enhanced. Synergies will be created with these technologies and services which will improve the socio-economic wellbeing of Malambians. This is likely to improve the living

standards, health, commerce, fiscal state of the government and investment climate in the country.

New Technologies

With new technology in the country's communication networks living conditions will be improved. Some of those technologies are listed as following:

- a. Multimedia applications such as WiMAX will be introduced in Malambia and their use will impact the different spheres of Malambians.
- b. Improvement of ICTs in Malambia will lead to provision high speed and quality, the multimedia audio and video and information streaming through technologies like WiBRO.
- c. Subscription to Pay per view Television (PTV) whether analogue or digital cable and satellite based TV services and digital terrestrial methods will ease access to information.

Other modern technologies, which may bring rapid development and transformation, in Malambia, are: NGNs, W-CDMA, ADSL, GSM 1900, HC-SDMA, UMTS, CDMA, EV-DO and many others.

New Services In Transformation Of Socio-Economy In Malambia

The ICTs reforms in Malambia should be the socio-economic development and transformation. There is relationship between access to telecommunication and per capita GDP. With better communication Malambians will trade and get informed.

All ICT services in Malambia will transform the socio-economic transformation of the people while giving confidence to international investors. This makes it imperative to the reform of ICTs in the country.

Underdeveloped as the country is, Malambia needs to introduce different services to better its economy. Where such services have been introduced sustainable development been realised.

The services that should be the acquisitions of Internet domains and sites, ICT Research and technological development, development and design in semiconductor, e-democracy, e-learning, e-government, telemedicine, e-procurement, e-commerce, video conferencing.

There are many benefits to the people of Rwanlawi from the use mobile phones technology such as:

- Business will increase and become cheaper with the use mobile phones and use of SMS to make orders for products and service as sellers and buyers will be in touch at any time of the day.
- It will be important in Telemedicine, the Doctors can check on the status of the patients where they m