

**ZAMBIA TRADE AND INVESTMENT ENHANCEMENT PROJECT
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TELECOMMUNICATIONS SECTOR REFORM

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Acronyms & Abbreviations

| | |
|---------|---|
| ATM | Asynchronous Transfer Mode |
| BTA | Agreement on Basic Telecommunication Services |
| CA | Communications Authority |
| CDMA | Code Division Multiple Access |
| CEC | Copperbelt Energy Company |
| DSL | Digital Subscriber Line |
| GSM | Global System for Mobile communications |
| ICT | Information and Communication Technology |
| IP | Internet Protocol |
| ISP | Internet Service Provider |
| IT | Information Technology |
| IXP | Internet Exchange Point |
| MBO | Management Buy Out |
| NTDF | National Telecommunication Development Fund |
| OECD | Organisation for Economic Cooperation and Development |
| PCO | Public Call Office (Public Telephone) |
| PoP | Point-of-Presence |
| PSTN | Public Switched Telephone Network |
| PTC | Postal and Telecommunications Corporation |
| PTO | Public Telecommunications Operator |
| SADC | Southern Africa Development Community |
| SMS | Short Messaging Services |
| SNO | Second National Operator |
| TDM | Time Division Multiplexing |
| TNS | Telecommunications network-based Services |
| VAN | Value Added Network |
| VAS | Value Added Services |
| VOIP | Voice Over Internet Protocol |
| VPN | Virtual Private Network |
| VSAT | Very Small Aperture Terminal |
| WLL | Wireless Local Loop |
| WTO | World Trade Organisation |
| ZAMNET | ZAMNET Communication Systems – first ISP in Zambia |
| ZAMPOST | Zambia Postal Corporation |
| Zamtel | Zambia Telecommunications Company |
| ZANACO | Zambia National Commercial Bank |
| ZR | Zambia Railways |
| ZESCO | Zambia Electricity and Supply Corporation |

Executive Summary

There is a growing global recognition that Information and Communication Technology (ICTs) is a major factor for social development and economic growth. In the business sector, ICT is increasingly seen as a driving force for innovation and business competitiveness. At the regional level, essential elements of the NEPAD program include radical improvement in telecom policy, information infrastructure, e-commerce and e-government services as a stimulus to rapid economic and social development. This recognition has been a primary motivation for increasing global liberalization of the telecommunications sector.

Information and Communication Technology is a broad category that includes telecommunications, computing and consumer electronics, broadcasting, policy and regulatory frameworks as well as the human resources required to develop and utilize them. The ability of any country to realize the potential benefits offered by ICT depends largely on the level of development of ICT in the country, including coverage, broad-based access and affordability.

The past decade has seen the emergence and development of a variety of indexes by international organizations that attempt to measure a country's preparedness to participate in the new knowledge-based economy. Regardless of the measure used, the development of ICT in Zambia is at a very low level, with a high risk of increasing marginalization, not only from the global economy, but also in the country's ability to realize its own development objectives.

Since 1993, with the assistance of the World Bank, Zambia has undertaken a number of measures to reform the telecommunications sector. These have included liberalization of the equipment industry, separation of the post and telecommunications operations into independent business units, liberalization of the broadcasting industry and setting up of an autonomous telecommunications and broadcasting regulatory authorities as well as establishment of cellular mobile operators and Internet service providers (ISPs).

A major outcome of the above reforms has been the rapid growth of cellular mobile telephony, which has surpassed fixed line services in terms of the number of subscribers. Increasingly, cellular mobile telephony has become the primary vehicle for providing universal access to voice telephony. However, this is unlikely to result in a reduction of the "digital divide", which is increasingly determined by wide access to advanced services such as the Internet.

Despite the sector reforms outlined above, Zambia lacks a modern digital ICT infrastructure that reaches most parts of the country and which can provide a platform for transition to a knowledge-based economy. The key problem is continuing lack of investment in telecommunications infrastructure. This has inhibited developments in value-added services or other ICT related areas such as distance learning, ecommerce and telemedicine.

The current inadequacies in Zambia's telecommunications infrastructure are directly linked to the performance of Zamtel. Under the Telecommunications Act of 1994, Zamtel is deemed to be licensed for the services it was providing when the Act came into force. These include the public switched telephone network (PSTN) and the international gateway. Since then, Zamtel has enjoyed an exclusive monopoly on the PSTN and the international gateway, which form a dominant part of Zambia's ICT infrastructure. As a result, the further development and modernization of Zambia's digital information infrastructure has been intrinsically linked to Zamtel's capability to improve and extend its network. But progress in this area has been extremely slow.

More fundamentally, inadequacies in ICT infrastructure also reflect underlying deficiencies in the institutions and policies that govern the sector. To date Zambia lacks an integrated ICT policy. This has resulted in fragmented efforts, with many pilot projects. In a reversal of roles, both the government and the regulator have had to depend on the Telecommunications Act, which itself is grossly inadequate, for policy guidance.

Zamtel's deemed license means that a large and dominant part of Zambia's ICT infrastructure and services is outside the control of the regulator. This has effectively denied the Communications Authority (CA) the opportunity to exercise its regulatory mandate over the telecommunications sector in the country and undermined its ability to prescribe conditions for interconnection among various networks. Interconnection is not only the cornerstone of competition but an essential factor to the development and provision of seamless and modern telecommunication networks.

Zamtel's exclusive monopoly on the lucrative international voice gateway has discouraged it from meaningful tariff rebalancing and charging economic rates for domestic services. Cross-subsidization practices have resulted in some of the highest international telecommunications charges in the region, which puts the business community in Zambia at a globally disadvantaged competitive position.

The universal service obligation is one of the major reasons that have been advanced to justify Zamtel's "natural monopoly". However, it is worthy to note that the current penetration rate of Zamtel's fixed network is 1 main line per 100 people, covering less than 3% of the households in the country. In reality, its deemed license, contrary to any claims, does not obligate Zamtel to any universal service provision.

Sheltering Zamtel behind the veil of public monopoly has not yielded desired results in network modernization or universal service. On the other hand, the ongoing technological advances exemplified by digitization, standardization, miniaturization, Internet and convergence of ICTs have effectively eroded the economic rationale for natural monopolies in the telecommunications sector. Increasingly, there is little or no justification to preserve Zamtel's continued exclusive monopoly in the PSTN and the international gateway.

In addressing the past failures and responding to the current global technological and economic trends, Zambia needs to engage in strategic thinking about how to attract the kind of investment that is required in the sector. The study has identified five major challenges as critical success factors for accelerated development of the ICT sector in Zambia; namely:

- Pro-competitive ICT policy and regulatory framework
- Infrastructure for a converging network
- Human resources
- Financial resources
- Universal access

Recommended Actions

The list below, summarizes key areas where action is required to jumpstart an effective telecommunications sector reform agenda.

1) Pro-competitive ICT policy and regulatory framework

- a) Adopt competition as a basis for further development of the sector:

Key action points

- i) License a Second National Operator to compete alongside Zamtel , including the PSTN and international gateway, before privatizing Zamtel
 - ii) Optimize use of available capacities by licensing other operators as carriers
 - iii) Encourage infrastructure sharing through market incentives and regulatory policies
- b) Effective separation of policymaking, regulating and operational management functions

Key action points

- i) Communications Authority: must be independent from operators and day-to-day government influence
 - Review Telecommunications Act with a view to re-licensing Zamtel
 - Clearly define the role and responsibilities of the regulators
 - Explicitly define enforcement powers of the Communications Authority in the telecommunications Act
 - Regulatory capacity building must be recognized as a national priority
 - Harmonize the institutional functions of the Communications authority and the Independent Broadcasting Authority (IBA)

ii) Policy Making

- Government has been largely dependent on Zamtel for policy advice. There is need to separate policy making from operational management of Zamtel
- Establish a fully-fledged ICT policy unit within the Ministry of Transport and Communications, which must:
 - Develop long-term social objectives and policy directions
 - Define universal service goals and objectives
 - Ensure that policymakers and other stakeholders are well-informed

iii) Service Operators

- Operations of service providers must be free from day-to-day political and government bureaucratic interference
- Operators must be accountable to the government and the public in achieving specific economic and social objectives, such as efficiency and universal service, respectively.
- The Board of Zamtel may have political appointees, but must be encouraged to act independently with due cognition of government policy objectives

2) Infrastructure & Financial resources

Key action Points

- a) Identify development of national digital (optic fiber) backbone a top national priority
- b) Encourage power utilities to rollout optic fiber networks that piggyback on their transmission networks wherever possible
- c) Recognize and prioritize potential offered by ZESCO for rapid optic fiber network rollout
- d) Government must take an active role to assist ZESCO to find a strategic joint venture partner and necessary funding
- e) Encourage infrastructure sharing by service providers on win-win and cost-based pricing principles
- f) Ensure that licensing fees for new entrants are not prohibitive or exorbitant but take into account the beneficial impacts of new investments
- g) Foster effective and enforceable regional collaboration and harmonization in ICTs to capture the associated benefits of large markets

3) Human resources

- a) Develop public sector capacity to formulate and implement appropriate ICT policies and to regulate them
- b) Integrate ICT qualifications in the tertiary education curricula
- c) Provide incentives for business to provide employees skills development training opportunities to use ICTs
- d) Encourage the private sector to provide certification ICT training programmes

1 Introduction

Telecommunication services are increasingly recognized as one of the major drivers of the evolving global economy. The rapid changes and convergence in the telecommunications and information technology (IT) over the last two decades have altered the way we conduct business and live. Telecommunication networks are being converted into giant computers, capable of transmitting all forms of communication – voice, data, images, music, and video. Continuously expanding applications of information and communication technologies (ICT) are transforming local, national, regional and international economies throughout the world into the so-called digital economies. Just as electricity, the telephone, railroad and automobile each provided a major stimulus to economic growth and a significant restructuring of most economies and societies during the 20th century, the ICT revolution is also in the process of creating another "paradigm shift" for 21st century network based e-economies.

There is now widespread recognition that telecom is no longer simply a convenient public service, but an enormously valuable economic resource, and an increasingly important infrastructure for economic growth and development. The technological advances and convergence of telecommunications, computing and broadcasting in the last two decades, as well as the organizational and regulatory improvement have increased the flexibility of telecommunications networks and the importance of telecommunications services. This has in turn increased the tradability of other services. Today, telecommunication services form the backbone of industries such as banking, airlines, tourism, distance learning and are increasingly a value-adding component of various consumer components. They are a critical component for innovation, business competitiveness and economic growth.

The increasing importance of ICT has also been recognized at the highest levels of national, regional and international governments as reflected in a variety of "Information Society" policy statements, from Okinawa to Ouagadougou. Essential elements in the NEPAD program include radical improvement in telecommunication reform, information infrastructure development, e-commerce and e-government services and applications as a stimulus to rapid economic and social development (NEPAD 2001).

Although the information society visions outlined in the policy statements of many governments vary considerably, they are all based upon a common premise – that the extensive use of advanced telecommunication networks for the communication of vast amounts of information will enable significant improvements in economic productivity, and provide a wave of opportunities for economic, social and individual growth. These advanced telecommunication networks will become the *information infrastructures* for a variety of new services that will transform economic and social relations and activities. The extent to which productivity improvements and benefits are actually realized by people, organizations and countries will depend on the development of their information infrastructure - the degree of convergence, access, quality, and services and prices of the telecommunications network.

This paper presents an overview of the status of key telecommunication services in Zambia and a set of key priority areas where action is needed today, if Zambia is to remain a relevant member of the global economy.

The first section of this paper provides working definitions of commonly used ICT terminology. The second section provides an overview of the current status of ICTs and market structure in Zambia, with a focus on basic telecommunications, mobile telephony and Internet services. The last section examines some key areas where deliberate action by government, in partnership with the private sector, is required to accelerate the growth and dynamism of ICTs in Zambia.

1.1 Definitions

Information and Communication Technology (ICT)

In this paper, ICT(s) is defined to include the following components:

- Telecommunications infrastructure
- Computer hardware and software applications, including consumer electronics
- Broadcasting
- Policies and regulatory frameworks
- Human resources to install and operate ICTs, develop and implement related policies

1.2 Common Telecommunication Terms

This section provides clarification for some of technological issues relating to information and communication technologies (ICTs) as used in this paper.

Telecommunications network-based services (TNS) can be defined as all the services that combine information production, manipulation, storage and/or distribution, with the use of telecommunications facilities and software functions¹. This definition sub assumes all different services such as voice or remote processing on the basis that they all depend on the telecommunication network, which is central. It also allows for technological changes without defining a set of basic services and another set of value-added services or differentiating between telecommunications hardware and software

Telecommunications network: refers to all processes that render it possible to transfer voice, data, and video with the help of some electromagnetic systems, including optical transfer methods. It is the system that operates between users or subscriber terminals such as telephones, computers, fax machines, etc. The various network facilities include public switched telecommunications networks (PSTN, like Zamtel), packet switched data networks, mobile networks, satellite facilities.

For a telecommunications network to function and deliver the services users are willing to pay for, it must be able to span distances, which in the extreme can be up to the other side of the earth. The technique used to transmit services over short and long distances is called **transmission**. Using this kind of technique it is possible to build transmission networks, which are divided into **local access*** and **trunk** networks. Access and trunk networks are interlinked through **nodes** (also known as **exchange(s)**). These can be divided into three categories: **local exchanges, national transit exchanges and gateway/international exchanges**. Access networks connect subscribers to local exchanges while trunk networks provide connections between exchanges. Local exchanges are connected to the nearest transit exchange.

National transit exchanges **switch** traffic within and between different regions in the country as well other operators. International and other gateway type exchanges **switch (or route)** traffic to telecommunications networks in other countries. Switching or exchange includes the process of connecting and disconnecting links (access and trunk networks) in different configuration to provide different access paths along which the signal travels. Switching technology is increasingly intelligent and software based and able to perform a number of services such protocol conversion, data processing, information storage and retrieval.

The two most important trends in transmission technology are digitization - the changeover from analogues to digital techniques and the introduction of fiber-optic transmission. Until the early 1990s, the access network was largely dominated by the use of copper wire line between the subscribers and their local exchange. The most important development in the local access network is radio (e.g. cellular mobile networks), which is capable of competing with copper lines in the PSTN.

Traditionally, telecommunication services were provided through government owned **Post, Telephone and Telegraph Administrations** (such as the PTC – forerunner to Zamtel and ZAMPOST). Since the 1980s, there has been a tendency to split them along functional lines (like in Zamtel and ZAMPOST), privatize them and/or allow competition against them (as in the entry of private cellular providers). The new telecommunication companies, whether private or public owned are referred to as **Public Telecommunication Operators (PTO)** – whose common characteristics is their provision of publicly accessible networks.

There are other service providers who provide specific network applications beyond basic services (i.e. voice and fax) and are usually referred to as **Value Added Network (VANs)**. As discussed above, the distinction between value-added and basic is blurred. In Zambia, value-added service providers include operators like ZAMNET, UUNET and Coppernet. However, their distinctive characteristics do not correlate to organizational boundaries, as in the case of Zamtel, which is vertically integrated.

* The local access network is also known as the subscriber network or local loop. As a rule of thumb, it accounts for about 50% of the investment in telecommunication networks.

1.3 Towards a convergent network

Just as the computer industry evolved from large mainframe computing to distributed “client server” computing, the telecom industry is moving from centralized switching to a more distributed network, with switching intelligence moving further out into the network edge. The fundamental change in the emerging converged network is the paradigm shift from **circuit switching** to **packet switching** – the use of data “packets”.

Circuit switching is the basic transport mechanism for voice in the PSTN, while packet switching was developed as the transport mechanism for data transmission. Unlike the traditional PSTN, which uses a combination of technologies such as time-division multiplexing (TDM) to deliver voices, the next generation networks employ packets to transport data – like an envelope that contains binary code. What makes packet transmission technology appealing is its efficiency. Voice, video, data can all be converted into “packetised” form. Thus any single network that is packet-based can (in theory) transport voice, video and data, thereby eliminating the need for separate networks. This digitization of the network infrastructure has been the key technological driver of convergence in the sector.

Convergence has been described by the ITU as the, “technological, market or legal/regulatory capability to integrate across previously separated technologies, markets or politically defined industry structures. Convergence also involves an important international component, as many services and information sources that were traditionally controlled on a domestic level are being provided on a global basis”. So while traditionally the market structure has been vertically integrated, convergence drives and is stimulated by a structural separation between three layers of activity: infrastructure, connectivity and applications and content.

The technological trend towards converged networks has also been accelerated by the liberalization of markets, which has enabled the development of global digital communication networks offering multiple services across national borders³. The demand for data and Internet services from business and consumer subscribers is accelerating the introduction of packet-based networks. The traditional PSTN with its circuit switching was not engineered to meet this demand and its transformation (i.e. investments in new technologies) will not happen overnight. In the interim, technologies like digital subscriber lines (DSL) are being deployed to meet the demand.

While convergence most commonly refers to the integration of the previously distinct industries of broadcasting, telecommunications and IT, it is also evident within industries themselves such as the convergence between mobile and fixed telecommunication services, which historically have been treated as discrete market segments. The convergence in this sector also allows for convergence of all knowledge and transaction based service industries, including finance, education and health. This is an important consideration in ensuring the policy integration needed in order to optimize the benefits associated with converged services and infrastructures.

One of the most visible demonstrations of this convergence phenomenon is exemplified by Voice-Over-Internet-Protocol (VOIP) – the convergence of voice telephony and the Internet. The concept driving this convergence is that of technological efficiency. The packetisation of voice telephony into digital bits allows use of less bandwidth thereby saving money. The use of less bandwidth also frees up capacity allowing transmission of more bits.

At the market level, convergence is most evident at the level of content, for example provision of news content across newspapers and, or television and on a website and services such as Internet offered over the PSTN, private ISP wireless network or over digital video broadcasting (DVB) networks bundled together with direct-to-home digital satellite television (DSTv). The effect of technological convergence means that there is likely to be greater competition, providing consumers with greater choice on price and quality between services offered across different platforms.

How the convergence will play out in Zambia will depend on our ICT policy, market, and regulatory arrangements. This is the challenge Zambia faces as it seeks to forge a proactive ICT policy and regulatory framework. Existing Information and Communication Technology (ICT) policies have tended to be fragmented, characterized by a narrow government focus on the traditional PSTN, missed investment opportunities, an ineffective and inhibitive regulatory framework.

For the potential of convergence to be realized an entirely new approach will need to be adopted - one that is more reflective of the information era and which will enable the development of the information infrastructure needed to underpin a modern, network economy.

2 Market Structure of the Telecommunications Sector

2.1 Market Structure Overview

The telecommunications sector in Zambia has experienced significant changes over the last decade. Access to information and the capacity to communicate have significantly increased with the advent of the Internet, digital satellite and mobile networks over the past decade. Since 1993, the Zambian Government has taken a number of measures to reform the telecommunications sector. These have included:

- Liberalization of equipment industry
- Deregulation
- Separation of posts and telecommunications operations into independent business units
- Setting up of an autonomous telecommunications and broadcasting regulatory authorities
- Liberalization of the broadcasting industry (opening up of the airwaves)
- Licensing and establishment of:
 - Mobile cellular operators
 - Internet Service Providers

- Private Data Networks Operators, including private VSAT network
- Private and community radio stations
- Private cable and free to air television stations

Table 1 below provides an overview of the liberalization and deregulation of the telecommunications services sectors in Zambia. With the exception of the voice (local loop and national distance) and international services *, the rest of the sector is very open to competition, with minimal restrictions on ownership.

| Table 1: Telecommunications Market Structure | | |
|---|---------------|---|
| Sub-sector | Status | Operators |
| PSTN | Monopoly | Zamtel – state owned |
| International Voice | Monopoly | Zamtel |
| National Voice | Competitive | Zamtel & Mobile Operators |
| Local Loop – Voice | Competitive | Zamtel & Mobile Operators |
| Mobile | Competitive | Zamtel , TELECEL & CELTEL |
| Internet | Competitive | ZAMNET, UUNET, Coppernet, Microlink & Zamtel Online |
| Private Data Networks (VSAT & leased Lines) | Competitive | Various |

2.2 Policy, Legal and Regulatory Environment

2.2.1 Telecommunications

In 1994, the Zambian Parliament passed the Telecommunications Act, which resulted in the restructuring of the telecommunications sector, separating the posts and telecommunications functions in the Posts and Telecommunications Corporation (PTC) into two separate commercial entities: Zambia Telecommunications Corporation (Zamtel) and the Zambia Postal Services Corporation (ZAMPOST). In addition, the Telecommunications Act of 1994 also provided for removal of the regulatory functions from PTC and the establishment of a regulatory agency, the Communications Authority (CA).

The Ministry of Communications and Transport (MCT) is responsible for developing policy and overseeing the activities of the telecommunications sector in Zambia. It oversees the functions of CA and appoints members of its Board of Regulators. The Ministry also oversees the activities of Zamtel and ZAMPOST. Parliament is responsible for ratifying the appointment of CA Board Members and to provide a portion of its funding when necessary. The Ministry of Finance serves as the government's shareholder in Zamtel.

* The Communications Authority has set \$15m as the fee for an International service license.

The CA is responsible for regulating the provision of telecommunications services and products. Its specific functions include:

- Issuing licenses and promoting competition amongst providers of telecommunications services and products. This excludes Zamtel's PSTN, which is deemed to be licensed as provided under the Telecommunications Act.
- Promoting the interests of consumers and other users of ICT services and products
- Ensuring that the benefits of the sector accrue to the citizens of Zambia.

In addition, the Radio Communications Act of 1994 gives the CA responsibility for administering the utilization of the Radio Frequency Spectrum, including: approving sites, issuing licenses and certificates, and preventing unauthorized disclosures and obstruction of radio transmissions.

In the exercise of its mandate and as a deliberate effort to promote local participation in the sector, the CA has arbitrarily established minimum local equity participation requirements for all licensed service providers. For example, the CA requires at least 25% local shareholding in Value-added Service (Type B) licensees and 40% for cellular mobile operators.

2.2.1 Electronic Media

The early 1990's saw the re-emergence of plural politics in the country and subsequently the liberalization of the media industry. The result was the proliferation of private-owned newspapers, private radio stations and community radio stations.

In 2003, the Government provided a stimulus for the liberalization of the broadcasting industry through the enactment of the following laws:

- Independent Broadcasting Authority Act of 2002
- ZNBC Amendment Act of 2002

The above legislation together with the ZNBC Act of 1987 and the Zambia National Broadcasting (ZNBC) (Licensing) Regulations (1993) provide the legal and regulatory framework for the broadcasting sector in Zambia. The Broadcasting Act also establishes the Independent Broadcasting Authority (IBA).

However, in respect of the emerging converged network, the establishment of the IBA as a separate and autonomous entity reflects the continuing traditional approach in which broadcasting and the telecommunications are still perceived as distinct silo activities. Given the capacity constraints that characterise the regulatory landscape in the country, the government should give critical consideration to combining the functions of the CA and IBA under one organisation.

2.3 Public Switched Telephone Network (PSTN)

Zamtel*, a 100% state-owned company is the only licensed PTO allowed to operate a public switched telephone network (PSTN) in Zambia. It also provides a wide range of services including local, national, long distance, and international fixed telephone services, radiotelephone, domestic satellite telephony (Dom sat), mobile telephone, and telex and leased line services. Its Internet service was commissioned in May 1997.

| Service Type | Date Started |
|---|---------------------|
| Local Telephony | 1913 |
| Long-distance and International Telephony | 1931 |
| Pay Phones | n/a |
| Cellular Telephony (AMPS) | 1995 |
| Internet Access | 1997 |
| Private Lines | 1913 |
| Telex | 1958 |
| Domestic Satellite | 1996/7 |

2.3.1 Transmission Network

Zamtel's trunk network links exchanges that carry inter-exchange traffic, and mostly consists of microwave links, though external cables are used in Lusaka and Ndola where multiple exchanges exist. The switching network consists of 93 automatic exchanges and 2 manual exchanges with an estimated installed capacity of 145,000 lines. There are three types of exchange technologies in use - digital, electronic, and crossbar. Approximately 70% of the installed capacity of telephone exchange lines is through digital exchanges and approximately 30% of the installed capacity is in analogue switches.

The Zamtel transmission network is predominantly analogue radio. However there are microwave thick routes that carry traffic to major provincial centers. There is a broadband digital microwave network linking Lusaka and the Copperbelt region and Lusaka and Eastern Province. A digital backbone linking Lusaka and Livingstone is being installed as a part of the Zamtel's GSM network rollout. Traffic to medium size towns and rural areas is carried via light microwave links that also enable connections with neighbouring countries. Due to declining use and the increase in Internet penetration, Zamtel has phased out its telex service. Zamtel is also responsible for distributing the broadcast signal to transmission station around the country.

* The Communications Act of 1994 provided for the separation of postal and telecommunication functions in the Postal & Telecommunications Corporation, leading to the creation of Zamtel, ZAMPOST and the Communications Authority of Zambia to regulate the industry

2.3.2 Satellite Networks

Zamtel has three earth stations, which were installed in 1974 (Mwembeshi I) and 1987 (Mwembeshi II), respectively and Mwembeshi III, which was completed in 2002. Apart from telephone services, both earth stations transmit and receive international television from INTELSAT global coverage beams. Over the past two years, Zamtel has also installed the Domestic Satellite system to provide telephony services to far-flung rural areas such as Sesheke and Kaputa.

2.3.3 Wireless Local Loop (WLL)

Zamtel has installed a WLL system to cater for scattered peri-urban and rural areas. At the present eight WLL systems have been deployed countrywide. However, rapid deployment has been impeded by financial constraints. Zamtel is currently conducting a gradual replacement of the analogue WLL system with digital technology, mainly in the urban areas along the line of rail.

2.3.4 Performance and Operational Constraints

At a time when the industry has been improving its global efficiency, Zamtel labor productivity has been almost stagnant for that last decade. The ratio of staff to lines is very high - less than 30 fixed lines per employee against an international standard of 200 lines /employee. Labour productivity in Zamtel is half of that of Rwanda telecommunications and less than 25% of Telkom South Africa⁴. This major difference in productivity can be attributed to a multitude of factors but is principally due to lack of investment in newer technologies.

In 2002, SIDA conducted a country ICT survey, which showed that between 1995 and 2000, Zamtel absorbed a total of US \$55m in bad debts compared to \$65m in investments. The average debt collection period was one year. During the same period, the SIDA ICT study estimated that uncollected revenues cost the company about \$150m in opportunity interest costs. In other words, if the customers had paid all their bills in time, Zamtel would have invested four times as much in new equipment and network expansion.

That the government is largely responsible for Zamtel problems is probably an understatement. The government owns Zamtel, appoints the Board, is Zamtel's largest customer, and together with its parastatal and other government organizations constitutes the major defaulter in settlement of bills to Zamtel. At the same time Zamtel is a major cash cow for the government. This phenomenon is one of the key factors that have contributed to the slow growth and modernization of Zamtel's national network and negatively affected the performance of the company.

2.4 National Backbone

Today, Zambia's telecommunications infrastructure is highly disjointed and seemingly moving in the opposite direction of the global technology trends towards converged network infrastructure. Each mobile operator has rolled out its own private digital microwave transmission network. Celtel has its own transmission network from Livingstone in the south to the Copperbelt in the north, which runs parallel to the Zamtel network. Similarly, Telecel also has a digital microwave transmission network linking Lusaka and the Copperbelt alongside those of Zamtel, CELTEL, ZESCO and Zambia Railways. This is a very absurd situation that is largely attributable to regulatory failure and lack of comprehensive national ICT policy. This has resulted in a massive and costly duplication of infrastructure, which is reflected in the prices consumers have to pay for communication services.

Secondly, Zambia's lacks a modern optical fiber backbone with regional and international connectivity. The Copperbelt Energy Company (CEC) recently installed a fiber backbone on the Copperbelt, whose excess capacity will be available for resale to potential users. ZESCO has a 45km fiber optic cable between Lusaka and Kafue and plans to piggy-bag fiber on all new 66kV, 220kV and 330kV power lines.

2.5 Universal Access

Though Zambia has made significant progress in telecommunications development in recent years, the telecommunications network infrastructure is starting from a very low level and is still at a very low level of development. This constitutes a major constraint in the provision of various services both in term of high costs and limited accessibility as evidenced by the low level of teledensity, which stands at 0.9. For example, the number of working fixed lines increased from 75,000 in 1994 to 85,000 in 2002, reflecting an average annual growth rate of 1.5% and below the average population growth rate of 2.9% over the same period. As a consequence, teledensity has declined over the recent years, partly also due to the economic recession and slowdown of business activity in the country.

Recent progress in the telecommunications sector is highly skewed and has been exclusively in favor of urban areas, which account for close to 90% of the PSTN deployment but only 50% of the country's population. This network is concentrated in Lusaka and Copperbelt, which account for approximately 50% and 30% of fixed lines, respectively. It is estimated that only 2.4% of the households in Zambia have access to a telephone line, which accounts for 47% of fixed line network capacity. In rural areas, the teledensity is 0.16, compared to around 2.6 in Lusaka*. The urban-rural telecom disparity is estimated at 7.8. This lack of telecommunication facilities in rural areas translates to

* This means that there is approximately one telephone line for every 600 persons in rural areas compared to almost 14 lines for every 600 people in Lusaka.

denied opportunities for the rural inhabitants and increasing inequity between them and their Zambian urban counterparts.

Zamtel has long claimed that it has a universal service obligation to provide services in rural and sparsely populated areas. But as in many monopoly environments, this has been resource constrained and as the ratios above indicate, this largely remained on paper. In fact, because of its deemed license, there is no entity that is mandated to enforce compliance with the claim of universal service obligation. Zamtel's current plans are focused on its entry into the GSM market as the third operator, largely financed through a supplier's credit. Very little funding is available for upgrading or expanding basic fixed network infrastructure, which is essential in fulfilling its universal service obligations. In the period 1995-2000, the annual investment in new equipment has declined from 25% of revenues to 8% in 2000⁵.

2.6 National Telecommunication Development Fund

In 1996, the Communications Authority of Zambia (CAZ) announced its intention to create a National Telecommunication Development Fund (NTDF), which is financed through a 5% levy on gross revenues from licensed operators. The fund is intended to assist in financing projects in rural and economically depressed urban areas. However, there has been little or no evidence of action since the announcement in seven years ago.

Whilst appropriate technology is readily available, shortage of supply is increasingly less a reason for lack of access and the growing digital divide between rural and urban Zambia. Perhaps the greatest danger in improving access is complacency⁶. Technology that theoretically provides telecommunications access from any place on the surface of the earth is already available. Universal access is now not so much an engineering or supply-side problem but rather a regulatory and policy challenge⁷.

2.7 To Privatize or Not Privatize Zamtel

The current inadequacies in Zambia's telecommunications infrastructure are directly linked to the performance of Zamtel, which has been the major player on the market since independence. More fundamentally, however, these inadequacies reflect underlying deficiencies in the institutions and policies that govern the sector.

Despite its monopoly position, Zamtel has failed to deliver on its claimed universal service obligations. Its exclusive monopoly on international voice gateway has resulted in some of the highest international telecommunications charges in the region, which puts the business community at a globally disadvantaged competitive position. As is the trend with major fixed line operators faced with competition from the growing mobile sector, Zamtel is focusing most of its efforts on rolling out its mobile telephony service and improving the quality and range of services on the PSTN rather than expanding its fixed-line network

Government has recognized these realities. As a result, there have been ambivalent attempts in the past to privatise Zamtel and attract private sector investment and management. Recently, the Government announced its intention to sell a 25% stake in Zamtel to a strategic partner. However, there have been many false starts and to date there is no schedule to privatize Zamtel. Instead there is a growing public perception and lobby group against privatization of Zamtel and other public utilities in light of past experiences of privatization in the mining and other sectors. There are concerns that privatisation would lead to unemployment, and government would not be able to replace revenue it now gets from Zamtel.

However, with revenues that have contracted in the past five years (SIDA 2002), and taking into account the recent global experiences regarding privatization of fixed line networks, Zamtel is not likely to attract many investors, if any at all. Most telecommunications investors in Africa are simply more attracted to the cellular mobile licenses, which present better investment return opportunities⁸. Furthermore, increasing international competition from callback services, VOIP, Internet and other new technologies have progressively eroded Zamtel's market position and revenues. While it may be possible to regulate against call back systems, it is difficult to enforce these regulations against the tide of new technologies. It is therefore realistic to assume that Zambia cannot expect any significant amount by privatizing Zamtel fixed line network.

On the other hand, given the past performance and service delivery capacity of Zamtel, there is little or no reason either to keep Zamtel a monopoly. Its failure to rapidly modernize its network to meet the demands of an increasingly data centric network has proven to be a significant hindrance to the rapid growth of the ICT sector, which has negatively impacted the development of the economy. It is hypothesized that the financial benefits of a growing telecommunications sector and economy to the country would probably far outweigh any realistic proceeds from privatization process. Yet without outside investment in Zamtel, it will be difficult to upgrade and expand its network.

Zambia is a country with very low tele-density and relatively high access charges. New market entrants are more likely to be interested investing in the sector, since prices are above costs* and there is large unmet demand. Learning from the experience of a number of African countries such as Uganda, Ghana, and Nigeria, a key strategic approach would be to open the whole sector (including international gateway) to competition. In this respect it may be more advisable for Zambia to consider the option of introducing a Second National Operator (SNO) before privatizing Zamtel.

Otherwise, privatizing Zamtel before further liberalization poses the risk of transforming a public monopoly into private monopoly, which in the absence of effective regulation or competition would use its monopoly position to extract higher profits that may not be re-

* Compare per minute charges between cellular mobile operators.

invested in the network*. Experience of many countries also shows that private monopolies are as effective as public ones at preventing the entry of new competitors⁹.

2.8 Mobile Network Services

Since the watershed Communications Acts of 1994, one of the most interesting results of the liberalization of telecommunications sector has been the accelerated development of mobile telephony. The most evident market difference between mobile and fixed line services is that, worldwide, mobile communications are growing much more rapidly and at an accelerating pace. In 2002, five years after introduction, the number of mobile subscribers surpassed the fixed-line (Zamtel) subscribers. As of June 2003 the number of mobile subscribers was estimated at 180,000[†] double that of fixed line subscribers and still growing. There are a number of reasons for this development:

- unmet demand that Zamtel has not been able to satisfy
- mobile networks can be installed more rapidly than fixed lines
- pre-paid mobile cellular allow users to obtain services where they may not normally qualify for a fixed or mobile post-paid service because of their low or irregular income or lack of known and fixed-abode
- Users find the functionality of mobile extremely useful (see Table 4)

| | <i>Fixed</i> | <i>Mobile</i> |
|----------------------|-------------------------|------------------------------|
| Calling | Place | Person |
| Pricing | Simple | Complex |
| Value-added services | Generally not available | Available some at extra cost |
| Internet Access | Faster | Slower |

On the other hand, fixed wire line growth is expected to stop growing in the near future as mobile and fixed wireless connectivity improves. The source of future growth for fixed wireless will be due to the high demand for faster Internet access. It is likely that firms and individuals may opt for mobile voice and retain fixed-line primarily for rapid Internet access.

* Just as much as a government might divert funds from Zamtel to activities unrelated to telecommunications, a privately monopoly might devote a larger share of profits as dividends to shareholders than reinvest in network expansion.

[†] Based on discussions with mobile operators

| Table 5: Regulatory and market structure of cellular industry⁶ | | |
|--|----------------------------|--|
| | Fixed | Mobile |
| Market structure | Monopoly | Competitive |
| Ownership | Government | Private/Government |
| International Arrangements | Bilateral accounting rates | Roaming arrangements and Clearing Houses |
| Regulation | Heavy* | Light |

The Communications Authority has licensed three mobile cellular service providers, namely Zamtel, TELECEL and CELTEL (formerly ZAMCELL) and offered a fourth license in 2002 to the pan-African operator - Vodacom (of South Africa).

| Table 6: Mobile Operators | |
|----------------------------------|---|
| Mobile Operator | Remarks |
| Celtel | 51% foreign-ownership – MSI, IFC, with 49% held for local participation. |
| Zamtel | 100% state-owned |
| Telecel | 60% foreign ownership (Telecel International) 40% local ownership [†] |

2.8.1 ZAMTEL

Whilst Vodacom – one of the five major players on the African scene – has been unable to take up its license due to spectrum regulatory and management issues, Zamtel has partnered with ZTE of China to deploy a GSM network. Zamtel’s Cell Z (GSM service) is now available in Eastern, Central, Copperbelt, Lusaka and Southern Provinces mainly along the line-of-rail corridor. Zamtel is also planning to roll out services quickly into all provincial centers by leveraging its domestic satellite transmission network. Cell Z’s business strategy appears to be based on low pricing and wider coverage, both of which leverage its PSTN infrastructure. With its geographical reach and aggressive competitive pricing, Zamtel is expected to capture a significant market share from both existing operators rather than through organic growth. As of October 2003, Cell Z had an estimated 53,000 subscribers.

* It is worthy to note that despite the fact that the Communications Authority lacks regulatory control over Zamtel’s PSTN, this has not eliminated regulation of the sector. Government effectively still owns and controls this sector and regulation has continued to be conducted from within government departments and Zamtel.

† This is seen to be in line with the stated policy of CAZ to ensure local participation in the industry through equity ownership.

2.8.2 CELTEL

CelTel is currently the dominant GSM operator with more than 50% of mobile subscribers. CELTEL Zambia (formerly ZAMCELL) CelTel was licensed in 1998 to build and operate a GSM nation-wide cellular telecommunications network in Zambia, is primarily owned by Mobile Systems International (MSI Investments - UK). Unlike Telecel, which built its own transmission network between Lusaka and the Copperbelt, CelTel initially opted to rent space from Zamtel digital microwave network. However, CelTel has completed building a broadband digital microwave linking Copperbelt and the tourist area of Livingstone with service in most of the major towns and cities in between. The service includes voicemail, prepayment for airtime, international roaming, and fax services. Recently CelTel launched service in Siavonga and Chipata, Kasama and Mansa using leased transmission capacities from ZESCO as well as satellite links. In 2002, CelTel's sister company CELPAY launched a mobile payment system by the same name.

2.8.3 TELECEL

Telecel, 1997, launched its cellular service using Code Division Multiple Access (CDMA) technology to provide both mobile and fixed wireless telephony. Telecel was the first to introduce CDMA technology in Africa while Zambia was the first country in Africa to use CDMA technology. In 1999, TELECEL replaced the CDMA with GSM system, which is the popular and agreed standard by the SADC member states. TELECEL built, owns and operates a broadband digital microwave transmission network that connects Lusaka and the Copperbelt. Telecel's cellular communication system is concentrated along the line of rail linking Lusaka and the mining region of the Copperbelt. Recently, Telecel has renewed its efforts to expand its network in the Southern province. Telecel is a subsidiary of Orascom (60%) - which is selling its shares (in Telecel) in preference of the lucrative deals in North Africa and the Middle East. This may affect Telecel's ability to rapidly rollout its service in new market areas.

2.8.4 Observations on the Mobile Sector

It is worthy to note that the number of mobile subscribers surpassed that of fixed line subscribers in 2002. As of June 2003 it was estimated that there were between 160,000-180,000 mobile subscribers compared to 89,000 fixed line subscribers. This signifies the beginning of fundamental shift in the competition and service delivery from government dominance to the private sector. Approximately 90% of the mobile subscribers use a pre-paid system.

Secondly, in the past, universal service strategies have traditionally focused on fixed line and access through telecentres. Current evidence shows that mobile connectivity has clearly become a major tool for achieving universal access and bridging the last mile (local loop) respect to voice telephony. However, voice without enhanced service access (i.e. Internet) will only serve to perpetuate digital divide. But, it is likely that by

increasing information exchange, further development of mobile telephony may positively impact on the demand for advanced services such as the Internet.

Before the rollout of Cell Z’s service, Celtel and Telecel tariffs were pegged between \$0.35 and \$0.60 per minute which is high in comparison to tariffs in neighboring countries and given that 80% of Zambian live on less that a dollar a day. The two service providers were perceived by the market to be - “cherry-picking low-hanging fruit” - content to compete on coverage service but not on price.

The entry of Cell Z (Zamtel) with it lower tariffs ranging from \$0.10 to \$0.37 is changing all that. It has generated an intense and growing competition for customer acquisition and retention through improved service and more attractive pricing and billing options. It has encouraged Celtel to expand its network into new and remote areas such as Chipata, Kasama and Mansa using satellite transmission networks*. It has also encouraged Telecel to extend its network coverage into the Southern Province and to offer its customers more value-added features (e.g. call forwarding) and attractive billing options†. Though it is too early to draw conclusions, it appears that the customer is likely to benefit further from the intensification of the competition in the cellular mobile sector.

2.9 Internet Service Providers

The Internet sub-sector is the most competitive in the telecommunications services industry in Zambia. The Communications Authority has licensed ten (10) ISPs of which only five are operational (see Table 7 below).

| Table 7: Internet Service Providers | |
|--|-----------------------------------|
| ZAMNET | (100% University of Zambia owned) |
| UUNET Zambia | (75% foreign owned - 25% local) |
| Coppernet | (51% locally owned) |
| Microlink | 51% local 49% foreign |
| Zamtel Online | (100% owned by Zamtel) |

* Currently Celtel has the largest cellular mobile network with more than half of the subscribe base in the country.

† In September 2003 Telecel introduced new billing options that extended the recharge and calling windows for prepaid subscribers.

2.9.1 ZAMNET Communications Systems

ZAMNET [<http://www.zamnet.zm/>] was the first ISP in Zambia and is wholly owned by the University of Zambia. ZAMNET is the market leader with approximately 40% of the dial-up subscriber market. It operates three VSAT-enabled Points of Presence (POPs) in Lusaka, Kitwe and Livingstone. Initially, this was due to inability of Zamtel's infrastructure to provide sufficient bandwidth. ZAMNET provides dial-up for consumers and leased-line and wireless Internet access, mainly to corporate customers. In addition, ZAMNET provides training, web design; hosting services and Internet related consulting services. ZAMNET also provides the University of Zambia with a subsidized Internet service.

2.9.2 Zamtel Online

Zamtel Online [<http://www.zamtel.zm/>] – is a division of Zambia's PSTN operator Zamtel and the second commercial ISP in Zambia. Zamtel operates a 6Mbps Internet pipe to the international Internet backbone through Mwembeshi Earth Satellite station. It provides dial-up and leased line and wireless Internet access. It is the only ISP in Zambia that provides local call access to its clients through virtual POPs in all major towns and exchanges. In reality, all Internet access calls to Zamtel Online are metered as local calls regardless of their origin. This has had the positive effect of reducing call charges, which account for the bulk of monthly Internet access charges, especially for users that have to make trunk calls to access the nearest Internet POPs, which are located in Livingstone, Lusaka and the Copperbelt areas.

On the other hand, this apparent cross-subsidization of trunk calls for Internet access– gives Zamtel an unfair competitive advantage over other ISPs. This effectively locks out other ISPs from the Internet market across the country where access charges are largely influenced by trunk call charges. However, because of the Internet market concentration in Lusaka and Copperbelt regions, in the long run, this is unlikely to adversely affect the current competitive landscape as other ISPs are more competitive in these regions and are able to offer more value-added and customer focused services compared to Zamtel Online.

Zamtel also provides an informal peering point for all the ISPs in Zambia. Though the peering services are made at no direct cost, each ISP must interconnect to Zamtel at full cost.

2.9.3 Coppernet Solutions

COPPERNET (<http://www.coppernet.zm>) is the second largest ISP in Zambia in terms of market share. Formerly ZCCM Internet services – Coppernet is a joint venture between Cavemont Securities and an MBO team from ZCCM. Coppernet operates two POPs in Lusaka and Kitwe, respectively. Its main focus is on the provision of Internet access,

voice and data communications lines including virtual private networks (VPNs). Coppernet provides dial-up access, DSL and wireless Internet connectivity, web design and hosting as well IT training services. In addition Coppernet provides a range of information and communication technology services, which include software development, networking, etc.

2.9.4 UUNET Zambia

UUNET Zambia, like Microlink, began operations in 2001 and is relatively new in the Internet market in Zambia. UUNET Zambia's principal shareholder is UUNET Africa, a joint venture between UUNET South Africa (a subsidiary of MCI, formerly WorldCom) and Africa Lakes Corporation (ALC). UUNET Zambia's principal business focus is on the provision of network connectivity solutions for corporates and other organizations. Starting from a low but rapidly growing blue chip customer base, and with deep financial and management support from a strong international corporation, UUNET is poised to be a major player in the near future. Like other private ISPs, UUNET operates a VSAT enabled Internet gateway linking it to the global Internet services.

2.9.5 Observations on the Internet sector

The Internet in Zambia is still developing. There are approximately 15,000 Internet subscribers and an additional 45,000 Internet users. The potential for very rapid growth is underlined by the low level infrastructure development, poor telephony penetration and high access costs.

The provision of Internet services is highly dependant on the capacity (or bandwidth) on the international, national and local access networks. Currently, all the ISPs in Zambia use satellite gateways for connection to the global Internet backbones, terminating either in USA or Europe. But satellite connectivity is expensive. Despite these high costs, each ISP operates one or two VSAT* Internet gateways rather than share costs and infrastructure, which translate into high end user costs.

Secondly, local ISPs must cover the total cost of the VSAT equipment and the satellite segment, which costs are passed on the consumer. This is different from the traditional bilateral telecommunications tariff settlement agreements in which the costs of an international segment are evenly split between the two operators in either country. In the case of the Internet, the local ISPs must meet the total cost of connecting to the international Internet backbone. This means that Zambian Internet users are effectively subsidizing non-Zambian users through the extension of the Internet to Zambia. The same applies to most countries in Africa.

* Unlike most countries in the region, the Communications Authority allows the use of VSATs for licensed operators at an annual cost of at \$1000 per VSAT node.

Thirdly, Zamtel operates the country's main international communications gateway - Mwembeshi satellite Earth station, through which it provides Zamtel Online with 6Mbps connectivity to the Internet. Ideally, this would provide a cost-effective shared gateway for all the ISPs in the country. However, Zamtel has opted to charge other ISPs around \$1250 per 64kbps compared to \$350 for non-ISP customers*. These prices are higher than what ISPs are now paying using their own VSAT gateways. Inevitably, this has encouraged them to maintain or set up their own VSAT-enabled Internet gateways rather than use Zamtel Internet gateway.

Fourthly, Internet access in Zambia is comparatively very costly. Dial-up Internet access prices range around \$50/month including telephone charges while a 64kbps can cost approximately \$750-\$900 per month. Given that the majority of Zambians live on less than a dollar a day, only a few can afford to pay such prices. This trend has encouraged the mushrooming of shared Internet access centers (i.e. Internet cafes) in most of the towns in Zambia.

Until the year 2000, most of the intra-country links and all Internet traffic between the ISPs were routed through the expensive international satellite routes. A study of intra-country traffic at that time showed that only 2% of the traffic was local. However, this is slowly changing with the penetration of the Internet, development of local content and digitization of Zamtel transmission network along the line of rail. Currently, ZAMNET, Coppernet and Zamtel Online are collaborating on local traffic exchange on a bilateral arrangement. Until such a time that an effective local Internet eXchange Point (IXP) is setup linking all the ISPs, Zambian Internet users will have to put up with a fragmented network, high access costs and slow Internet speeds.

It is also important to note that the lack of suitable infrastructure has slowed down the penetration of Internet and other data services in the country. Most of Zamtel's existing infrastructure was not designed for transmission of data packets. Thus, there is need for a deliberate national effort to modernize the network across the country. Otherwise, the digital divide between the urban and rural areas within Zambia and between Zambia and the rest of the world will widen and deepen, with the high risk of further marginalization.

Barriers to entry

Though there are no market entry restrictions for new ISPs, the \$40,000 fee for an ISP license has proven to be prohibitive in the past. This has since been revised downwards by almost 50%, which is still high for most Zambian SME investors. In addition to high license fees, other regulatory barriers include delays in spectrum allocation and licensing for wireless Internet provision.

* Zamtel claims that the segment offered to ISP for is guaranteed up to the terminating point either in Europe or the USA (GIB) unlike that offered to non-ISPs which is only guaranteed between the user and Zamtel PoP. However, past experiences with the Zamtel have disproved the claim that they do provide guaranteed international bandwidth (GIB).

2.10 Private Data Networks

The financial sector dominates the private data network segment of the market. All foreign banks in Zambia as well as ZANACO have setup their own advanced network solutions linking their branches in Zambia to their national or international data networks.

Barclays Bank has the largest network among the banks with all processing taking place in Harare (to be shifted to London soon) followed by Zanaco. Similarly, Standard Chartered has set up a VSAT network linking its branches across Zambia to the central data processing facility in Nairobi. This means that in general, when a customer presents a check at any branch, the transaction takes place in Nairobi or virtually anywhere in the world.

The introduction of these technologies in Zambia has tremendously improved the delivery of financial services, with cash withdrawal facilities for VISA and other international cards.

The Table 8 below provides a list of major players in the private data networks segment

| Table 8: Private Data Networks | | |
|---------------------------------------|--|---|
| Type of Network | Users | Remarks |
| VSAT/Satellite | Major organizations like Zambia Revenue Authority, ZANACO, Barclays Bank, NAPSA, Standard Chartered Bank, STANBIC, Supreme Furnishers operate their own VSAT data networks UUNET & Coppernet offer VSAT solutions All ISPs have their own VSAT-enabled gateways. | “Open skies” Fully competitive. Requires Type B data network license and annual fee for each SAT Fully competitive. Fully competitive |
| Wireless Local Loop | Zamtel offers digital and analogue WLL for the last mile connection ALL ISP offer wireless broadband Internet connectivity | Monopoly Fully competitive. Licensing required for radio spectrum |
| Major Data/Leased Lines/VPNs | UUNET, Zamtel and Coppernet | Fully competitive |

3 Telecommunications Sector Reform: The Challenges Ahead

“Given the vital role of telecommunications play not only in such obvious fields as emergencies, health and other social services, administration and commerce, but also in stimulating economic growth and enhancing the quality of life, creating effective networks world-wide will bring immense benefits. An increase in international traffic will generate funds, which will be devoted to the further improvement and development of telecommunication services. The increased flow of trade will contribute to better international relationships. The progress of creating effective networks worldwide will provide new markets for high technology and other industries, some of which are already suffering surplus productive capacity. The interest industrialized and developing countries share in the worldwide development of telecommunication is as great as in the exploitation of energy, and yet far less appreciated.

We look to governments of industrialized and developing countries alike to give fuller recognition to this common interest and to join their efforts to redress the present imbalance in the distribution of telecommunications, which the entire international community should deplore...

First governments and developing agencies must give a higher priority than hitherto to investment in telecommunications.

Secondly, existing network in developing countries should be made more effective, have an objective of commercial viability, and should become progressively self-reliant. The benefits to the new technologies must be exploited in full to the extent that these are appropriate and adaptable to the countries' requirements.

Thirdly financing arrangements must take account of the scarcity of foreign exchange in many developing countries, and

Fourthly, the ITU should play a more effective role.”

Maitland Report.

International Telecommunications Union (ITU) 1984

Overview

The development of ICT(s) in Zambia is at a very low level. The needs are so great that only a fundamental paradigm shift in approach to communication will provide the necessary solutions to the immense backlog. Lack of ability to respond timely to these challenges presents a high risk of increasing marginalization, not only from the global network economy, but also in Zambia's ability to deliver on its own developmental objectives.

In 2002, the government appointed a technical committee to coordinate the process for the development of an Integrated ICT policy and development plan. This arose from recognition of the failure of existing policies to deliver on anticipated outcomes and the need to respond to the global technological and economic trends. An analysis of the problems and the effort required to accelerate diffusion of ICTs suggests that a wide range of concerted actions, over a wide front and at different levels are needed.

But one thing is clear though, given the current challenges posed by global technological and economic trends, Zambia needs to fast track the policy process and implementation plan to realize the potential benefits from ICT applications. The opportunity cost of not moving as rapidly as possible to developing a dynamic infrastructure and flexible regulatory framework, is high and likely to further widen and perpetuate the digital divide. This is a major developmental challenge for policy and other decision makers. It is here that the potential not only of technological 'leap-frogging' but abandonment of linear development approaches to market structures and their associated regulatory regimes, need to be courageously considered³

The main goal of the ICT policy would be to develop an integrated and comprehensive national communication development framework which:

- Preserves value of existing ICT infrastructure
- Optimizes use of existing telecommunications capacities in the country so improve service quality and reduce costs
- Prioritizes the development of a modern national telecommunications infrastructure
- Attracts and encourages new investment in the sector
- Promotes broad and affordable universal access
- Provides a platform for advanced communications services (such as broadband internet) for the business community.
- Promotes the development of human resources to develop and apply ICTs
- Vigorously promotes and supports the development of local ICT industry

As the policy shifts required achieving the above outcomes are likely to be dramatic, they are likely to require long timeframes to implement. In this regard prioritizing and sequencing policy and regulatory issues and action is essential. Equally important will be the development of strategies to bridge the transition and also to ensure that the current policy failures are not aggravated during the transitional period. In this respect, there is

urgent need to develop requisite ICT policy capacity in the Ministry of Transport and Communications.

Through a wide consultation process among stakeholders, five major challenges have been identified as critical success factors for accelerated development of the ICT sector in Zambia:

- Pro-competitive ICT policy and regulatory framework
- Infrastructure for a converging network
- Human resources
- Financial resources
- Universal access

These are discussed in more detail in the remainder of this paper

3.1 Need for a Pro-competitive ICT Policy and Regulatory Framework

Traditionally, the broadcasting and telecommunications markets have been characterized by full state control (i.e. Zambia National Broadcasting Corporation and Zamtel , respectively) with very high levels of regulation. The rationale for a monopoly and regulating of broadcasting content was for decades justified largely on political and socio-cultural grounds. Because radio and television has been provided as common and free to air services, control has been exerted over content in the name of consumer protection on the grounds of national security, morality or cultural values as well as to promote local content.

On the other hand, while the basis for regulation of telecommunications infrastructures has been the utilization of scarce resources, particularly spectrum, the rationale for a natural monopoly in telecommunications has been underpinned by economic justifications. Public utilities such as telecommunications and electricity were considered ‘natural monopolies’ in that services could not be duplicated easily due to economies of scale, scope of complexity imposed by proprietary technologies, as well as considerations of these services as a public social good.

However, technology advances have undermined both scale economies and resource scarcity as well as public interest assumptions that justified the telecommunications sector as a natural monopoly and public utility. The digitization process, and its resultant trends towards standardization and non-proprietary systems and the new global environment has led to mass production of communication equipment and lowered the entry barriers.

Low cost wireless technologies have made possible the far more rapid deployment of cheaper networks to compete with or complement existing fixed networks. The emergence of the Internet with its global and digitized nature has eroded traditional mechanisms of controlling content, making enforcement very difficult at the least. This is

also evidenced by the emergence and growth of call back systems in the country. Similarly, the growth on mobile subscriptions has debunked the myth of the state-owned operator as the key vehicle for attaining universal service.

National Optic Fiber Backbone

Zambia's information society perspective, like those of other countries, is based upon a common premise – the availability of a cost effective and ubiquitous ICT network infrastructure that is accessible to everyone. The successful development of e-commerce and e-government requires that business and government have efficient telecom links with consumers and citizens, respectively.

However, the existing national information infrastructure is grossly inadequate to support Zambia's transition into the emerging knowledge-based economy. It is almost impossible to exaggerate the demand for more network capacity. Zambia lacks modern digital ICT infrastructure that reaches most parts of the country. The key problem is continuing lack of investment in telecommunications infrastructure that has also slowed down developments in other ICT related application areas, such as provision of distance learning and telemedicine services.

Zamtel and the basic fixed network services it provides are dominant components of the national information infrastructure. Given Zamtel's exclusive monopoly in the PSTN, further development and modernization of Zambia's digital information infrastructure has been tied to Zamtel's capability to improve and extend its network. To date, this process has been extremely slow and the potential for telecommunications sector reforms which begun in the early 1990s has not been fully realized.

Zamtel exclusive monopoly on the PSTN and international gateway

Throughout the telecommunications reform program, which began in the early 1990s, Zamtel retained a monopoly on the domestic fixed line and the lucrative international services*. As a result, this has discouraged Zamtel from charging economic prices for domestic calls, which are subsidized by revenues from international services where prices are still inflated and are among the highest in the region. This has also significantly contributed to the high cost of doing business in Zambia and thereby rendering Zambian businesses less competitive on the international market.

Zamtel's exclusive monopoly on the lucrative international network segment gives it undue advantage over other providers such as mobile operators who have to compete with Zamtel in the domestic market. Zamtel is able to cross-subsidize services where there is competition and at the same compel other operators and consumers who need to use its international services to pay unreasonably high prices†. This undermines the

* The Communication Authority 's insists that all segments of the market are open to competition and that any provider can apply for an international license gateway. Nonetheless the \$15million license fee tag essentially preserves the incumbent operator's monopoly on international networks.

† Price trends in settlements of international telecommunication services and comparison with other countries in the region (Namibia has cheapest international services) suggest that it would be possible to reduce international rates by 50%

benefits of introducing competition in the sector with resultant sub-optimal utilization of existing network capacities.

3.2 Universal service and national network build out.

One the most striking aspect of the Zamtel is in the provision of rural services. Zamtel's recent improvements in the telecommunications network have tended to benefit the urban rather than rural areas. Although 60 percent of the population lives in the countryside, rural inhabitants have access to less than 15 percent of Zamtel 's exchange lines. The current penetration rate of Zamtel 's fixed network is 1 main line per 100 people, covering less than 3% of the households in the country. Without significant investment and rapid network extension, Zambia's e-economy will be restricted to less than one-thirtieth (i.e. 1/30th) of its population.

If the majority of the population is either not connected, or cannot afford to use the services, economic growth will be restricted, and Zambia's vision of the emerging digital economy will remain just a dream confined to an elite minority. If the majority of the people are not connected they cannot participate. This will lead to a wider digital divide – making the task of reducing the poverty levels in the country even more difficult.

3.3 Need for a competitive environment

Relying solely on Zamtel to achieve universal service has not yielded desired results. Its deemed license, contrary to any other claims, does not obligate Zamtel to any universal service provision. Sheltering Zamtel behind the veil of public monopoly has not produced the required results in network modernization. In respect of the foregoing, there is increasingly little or no justification to preserve Zamtel's exclusive monopoly in the PSTN* .

However, it is also important to note that privatization of Zamtel without further market liberalization is likely to result only in transfer of monopoly power to the private sector. A private owner is just as likely to divert a larger portion of profits as dividends to shareholders as much as government is able to divert earnings from Zamtel to other areas not related to communications.

Recent studies and experiences of privatization in many countries also indicate that while private monopolies are as effective as public ones at preventing the entry of new competitors, however, in terms of efficiency - the advantages of private ownership over public ownership are considerably weaker in monopolistic markets[†]. In other words, private rent-seeking behind protective barriers cannot be expected to lead to socially efficient results.

* It is possible that privatization of Zamtel without further market liberalization will only result in transfer of monopoly power to the private sector. A private owner is likely to divert a larger portion of profits as dividends to shareholders as much as government is able to divert earnings from Zamtel to other areas not related to communications.

[†] (See, for example, Vickers and Yarrow [1988]).

Therefore, in addressing the failures of the past and responding to the current global technological and economic trends, Zambia needs to adopt a pro-competitive telecommunications policy and regulatory framework. In fact there is now an urgent and compelling need to introduce competition at all levels of the ICT sector as a means of attracting investment in the sector, expanding access and reducing the current high costs of services. In particular, the government needs to give urgent consideration to further liberalization of the market by introducing a Second National Operator (SNO) and extending it to the international gateway, before or parallel to privatizing Zamtel .

3.4 Licensing other carriers

Secondly, to optimize the existing capacity of various networks in the country and to drive down the prices to more competitive regional levels, there is need to encourage facilities-based competition, i.e. infrastructure sharing at mutually agreed rates among operators. Apart from encouraging infrastructure sharing, this will also enable organizations such as CEC, ZESCO & Zambia Railways (ZR), including cellular companies to provide excess facilities to any service provider. Ideally these carrier networks should not be permitted to compete with these service providers to ensure the same problems of anti-competitive behavior often associated with the vertically integrated Zamtel , do not arise here again. The greater choice of additional facilities providers will allow for increased competition in the market and incentives to provide facilities on cost-based pricing.

More significantly Zamtel would be induced, with the correct market incentives and regulatory framework, to encourage competitive access to its networks and facilities (i.e. interconnection) and increase the wholesale aspects of its business, so as to avoid the unnecessary self-provision and duplication of infrastructure and thereby creating new strong revenue streams for itself.

The likely outcome of the introduction of competition would be:

- Attraction of new investment into the sector,
- Reduction in international tariffs which tend to raise the costs of doing business in Zambia,
- Improvement in range and quality of value-added services,
- Improved management of Zamtel , and reduction in government interference in the operations of Zamtel as exhibited by large write-offs of bad debt owed by the public sector.

Ultimately, Zamtel is more likely to become a more efficient commercial and progressively self-reliant enterprise with an inherent urge to exploit the benefits that the new technologies present.

3.5 Regulation: Key to Successful ICT Policy Reform

There is now widespread recognition that the success of telecommunications reform and the effectiveness of telecommunication markets to improve efficiency and achieve public policy objectives depends largely on the establishment of a credible, competent and effective regulatory system. An expanded role of the market, as suggested in the section above, can facilitate not only improved efficiency but also the achievement of public desirable policy objectives such as universal access.

However, markets by their nature can be highly imperfect and unstable. Markets do fail, just as governments do fail. Thus, the effectiveness of telecommunications market (and the success of telecommunications reforms) is dependent on interventions of the “visible hand of the market” - through a competent and effective regulatory system. A key challenge for Zambia is to create such a regulatory and institutional environment so as to optimize use of market forces to achieve both efficiency and public policy objectives.

Under the Telecommunications Act of 1994, Zamtel was deemed to be licensed for all services it was providing at the time the Act came into force. These include the public switched telephone network (PSTN), as well as the international gateway. The exceptions are Internet and cellular mobile telephony services for which Zamtel has separate licenses.

Given the fact that the Telecommunication Act does not provide for CA oversight on an operator with a “deemed license”, Zamtel and consequently a large and dominant part of Zambia’s telecommunications sector are beyond the regulatory reach of the CA. In other words, Zamtel is a “self-regulating” entity, unlike other service providers who have to operate under the CA’s regulatory framework.

CA’s lack of regulatory authority on Zamtel has hampered progress in tariff rebalancing, that is the ability to implement cost-based principles by raising line rental and local calls charges while reducing international tariffs. Instead, Zamtel has pursued a slow and self-regulated strategy towards rebalancing of tariffs, with very minimal progress over the last decade. The revenues from the lucrative international segment have discouraged Zamtel from charging realistic prices on the domestic market.

The CA has found itself increasingly powerless to overcome Zamtel’s political power pressure to have the deemed license revoked and to re-license Zamtel to ensure a level playing field. The failure to have Zamtel re-licensed has effectively denied the CA the opportunity to exercise its regulatory mandate over the telecommunications sector in the country. It has, also, effectively undermined the CA’s ability to prescribe conditions for interconnection among various networks. Instead, Zamtel has taken advantage of this situation to impose its own terms for interconnection to the PSTN. As a result, this has now become a major source of tension in industry.

Interconnection is not only the cornerstone of competition but an essential factor to the development and provision of seamless and modern telecommunication networks. It is

also a regulatory issue which is of increasing importance in achieving most of the government's telecommunication policy objectives (Melody 1998). As such, it is a concern for all stakeholders, including consumers who must be protected from the abuse of monopoly power and hence cannot be left to the operators and the regulator alone.

A discussion of the credibility of regulation cannot ignore the legacy of government ownership in Zamtel. The inclusion of the Regulator* and the Permanent Secretary in charge of the telecommunications portfolio in government on the Zamtel Board - has called into question the independence, impartiality, professionalism, transparency and credibility of the regulator, particularly given that the PSTN network is outside the regulatory control of the CA.

In summary, given the above, the messages that potential investors are getting are that:

- The regulator cannot make independent, impartial and transparent decisions
- The regulator does not have the legal powers necessary to treat competitors fairly
- The government is effectively the regulator and that the risks of unilateral, unjustified government intervention are extremely high.

Given this background, it is not surprising therefore that there was only one bidder for the 25% stake in Zamtel in late 1990's and only one bidder (Vodacom) for the fourth cellular operator license in 2002.

3.6 Towards A Credible Regulator

There are three distinct functions that are core to effective telecommunication sector reform namely: policymaking, regulation and operational management. The effectiveness by which the separation of these basic and fundamental functions is achieved will have a significant impact upon implementation of the reforms, investment and growth in the sector (Melody 1998).

Regulation (Communications Authority)

It is important that the regulator (i.e. the CA) must be independent both from the operators (Zamtel, Celtel, Telecel, etc) and from day-to-day government influence. The regulator's task is to implement government policy that has been legislated. Though it is expected that the regulator can never be absolutely independent of the government, the regulator must guard their independence jealously and be seen to be transparent, fair, enforceable and predictable to both the operators/investors and to end-users

“The success of telecom reform will depend heavily upon the establishment and maintenance of effective regulation, which must encompass a wide range of expertise and be informed, forward looking and adaptive in helping to shape the information infrastructure that will provide the foundation for 21st century information societies”

William Melody 2001

In order to transform the CA into legally predictable and credible institution – it needs to be given the independence and enforcement powers that telecommunication regulators

* The outgoing regulator has been a member of the Board of Directors of Zamtel(See SIDA 2002)

have in countries that are succeeding with their telecom reforms, such Botswana. Without enforcement powers, the CA will be rendered into a “toothless bulldog”. Potential investors need to be convinced the regulatory process is credible and decisions will actually be made objectively, on merits on available information and will be enforced.

The first step required is to review and amend the existing legislation to ensure that Zamtel is re-licensed to ensure effective regulation of the industry. Secondly, there is need to legally define the quasi-judicial role, responsibilities and enforcement powers of the Communications Authority in the Act. Thirdly, there is need to address capacity constraints in the CA and to ensure that regulatory capacity building is considered as top and permanent national priority. Achievement of success will require building expertise not only within the regulatory bodies but also across a broad spectrum of stakeholders, including judges and lawyers who arbitrate issues related to the ICT sector, operators/investors, and most importantly, the end-users.

Given the convergence trends in the ICTs, consideration must also be given to harmonizing policy making and other institutional arrangements between Communications and Broadcasting ministerial portfolios and regulatory bodies respectively*.

Policy Development

Due to legacy issues, the government has largely depended on Zamtel and the Communications Authority for ICT policy advice. There is need to effectively separate the functions of policymaking by government and operation management of Zamtel. Policy making functions of government must be directed toward fundamental issues of long-term societal objectives and directions, not issues of day-to-day implementation and problem solving. There is need to ensure that policymakers are informed and capable of addressing the need for visionary policy change when it is required.

At present, the government lacks adequate ICT policy-making capacity. Urgent action is needed to establish a fully-fledged ICT policy unit in the Ministry of Transport and Communications.

Public Telecommunications Operators

Recalling the Maitland Report recommendations (see box on on page 21), there is need to ensure that operations and management of service providers are clearly separated from the government so neither politicians nor government bureaucrats can interfere in day-to-day operational decisions of the operators. In particular, Zamtel as a state-owned operator must be insulated from day-to-day political and bureaucratic government interference, and in turn it must be fully accountable to the government and the public in achieving specified economic (e.g. efficiency) and social (e.g. universal service) objectives. Its

* Following the enactment of the Broadcasting Act of 2003, the Government is currently in the process of setting up an Independent Broadcasting Authority (IBA)

Board of Directors may have political appointees, but they must have mandates to act independently with due cognition of government policy objectives.

Implementation of these proposals would improve the structural independence of the Communications Authority and its delivery capabilities, allowing it to achieve credibility both within government and the industry and considerably reduce the regulatory risk of “industry” or “political” capture. It will facilitate strengthening of capacity in ICT policymaking in government while providing ample space for the operators to deliver on the expected outcomes – to ensure an accelerated modernization and expansion of telecommunications service, which is accessible and affordable by the majority of the people.¹⁰

3.7 Infrastructure – Need for a National Optic Fiber backbone

The progression of Zambia, towards the emerging digital economy will largely depend on the existence of a digital national backbone capable of delivering a plethora of value-added services to all parts of the country as well as providing cross-border connectivity.

Given current technology trends, the preferred platform for such a national digital backbone is an optic fiber network reaching all major parts of the country. At present, Zambia has only a 540km high capacity optic fiber network on the Copperbelt owned by CEC and 45km of optic fiber cable between Lusaka and Kafue owned by ZESCO.

It is estimated that the cost of installing optical fiber to most parts of the country on all of ZESCO existing 66kV and above power lines will be in the range of \$50-\$60m (almost equivalent to \$50m Zamtel has written off in bad debt during the period 1995-2000). Possibilities also exist for connecting to the submarine cable through Botswana and Namibia who have rolled-out high capacity optic fiber networks up to the border towns of Kazungula and Katima Mulilo respectively. The backbone could be further extended to the proposed East Africa submarine cable through Tanzania over the proposed Zambia-Tanzania-Kenya inter-connector power project.

Among existing stakeholders the private mobile cellular companies have indicated they are very unlikely to invest in a national optic fiber backbone, as this would be digressing from their core business*. On the other hand, the power utilities (ZESCO & CEC) have or plan to rollout very high capacity optical fiber networks that piggyback on the power transmission cable networks. ZESCO’s extensive power transmission cable network makes it an ideal platform for a nation-wide and regional broadband network. Although this is not their core business, it is in line with international trends among water and power utilities to leverage their existing infrastructure and right-of-way to setup telecommunications facilities.

Rolling out a nation wide optic fiber network requires large-scale sustained investments, which in the case of ZESCO, is not readily available. However, the potential offered by

* ICT Policy Infrastructure sub-committee submission on the ICT draft policy.

ZESCO for a rapid rollout can be realized sooner if they are able to find a suitable partner and funding. The Government, as the principal stakeholder, must take a leading and active role to assist ZESCO to find a strategic joint venture (JV) partner and secure funding for the optic fiber network project.

3.8 Global Policy Making and Regional harmonization

Internationalization of telecommunication services has resulted in the largest and most complex system by human beings. As a result, core aspects of policy decision-making are being transferred from the national level to the global level. Increasingly, there is a growing link between regulatory frameworks that are emerging from multilateral organizations and development of ICTs at national levels.

Intergovernmental organizations like the World Trade Organization, International Telecommunication Union, World Intellectual Property Organization; regional forums like the Organization for Economic Cooperation and Development (OECD), and new policy institutions dedicated to ICT such as World Wide Web Consortium, Internet Engineering Task Force and the Internet Corporation for Assigned Names and Numbers (ICANN), have become extremely important as their decisions directly affect developing countries, like Zambia. Market access and regulatory commitments to the World Trade Organization (WTO) are influencing domestic ICT policies, particularly the liberalization, privatization, competition and investments in the telecommunication sector.

In order to strengthen the regulatory capacity of the CA and take the initial steps in attracting much needed investment in the sector, Zambia needs to give deep consideration to making full commitments to the WTO Reference Paper on Basic Telecommunication Services (see box below). This is important to the extent that it will enable Zambia to:

- Galvanize consensus on telecommunications sector reform agenda and consolidate a firm time table
- Assure investors of a secure and rules based environment
- Elaborate interconnection and essential-facilities access obligations for Zamtel and others that may be in a dominant position in the future
- Strengthen regulatory capacity – to implement desired reforms that will enable Zambia obtain maximum economic benefits from the ongoing development in ICTs
- To enable Zambians to adapt to new ICT changes and keep pace with the global information infrastructure developments.

Box 1. The WTO Reference Paper

WTO Reference Paper addresses six major points, which are summarized below.

- The Reference Paper sets out rules for governments on regulating “major suppliers” of telecommunications services. A major supplier controls “essential facilities for the public network” that cannot reasonably be duplicated for economic reasons, technical reasons, or both.
- It requires governments to take measures to ensure that major suppliers do not engage in anticompetitive practices such as cross-subsidies, use information obtained from competitors, or withhold needed technical information from competitors.
- It states that governments will assure interconnection with a major supplier for competitors at any technically feasible point in the network. The terms, conditions, and quality must be nondiscriminatory (that is, no less favorable to the competitor than to the major supplier). Interconnection must be timely, and rates must be reasonable and transparent, taking into account economic feasibility. Services must be unbundled so that suppliers are not paying for network components or facilities they do not need. The terms for interconnection must be publicly available and enforceable on a timely basis.
- It allows governments to maintain policy measures that are designed to achieve universal service. However, these measures must be administered in a transparent, nondiscriminatory, and competitively neutral way. They should not be more burdensome than is necessary to achieve universal service.
- It stipulates that the regulatory body be separate from the actual suppliers and that it employs procedures ensuring impartiality for all market participants.
- It requires governments to use procedures for the allocation and use of scarce resources (including frequencies) that are timely, objective, transparent, and nondiscriminatory.

Regional Cooperation

Zambia is a small economy. Its ability to attract investments, operate international services and to participate effectively in the international ICT decision making forums is far more likely to succeed through regional harmonization, as the benefits of convergence are realized in scope, scale and ability of services offered seamlessly across diverse cross-border backbone infrastructures. The cost-effectiveness of digital communication will be enhanced greatly by the harmonization of policies and practices within the region that create larger and more attractive markets for investors, with the associated benefits for users. In this respect, Zambia needs to marshal its intellectual capital and expertise to effectively participate in these regional and international forums in furtherance of its national objectives.

3.9 Towards an Integrated ICT policy

The transition of Zambia towards the emerging knowledge-based economy will not be easy. Success will only come in stages. All of this is dependent on a highly integrated and coordinated national ICT policy and plan that will include strategies to attract

investments, develop and retain the necessary human, financial and intellectual capital needed to operate the information infrastructure.

At present, Zambia lacks a defined government policy on telecommunications. Though there exists a general ruling party policy as contained in MMD manifesto^{*}, this is insufficient to provide a holistic roadmap for the development of ICTs in the country. In the absence of a definitive government policy, both the government and Communications Authority have tended to be guided by Telecommunications and Radio Acts, which are grossly inadequate.

It is with this understanding that the government, in 2002, appointed an ICT Policy Technical Committee to recommend a comprehensive ICT policy. The committee is expected to submit its recommendations to Cabinet early 2004.

The ICT Policy Nexus

The new ICT policy must address the inadequacy of ICT infrastructure in the country. In doing so, it must avoid unnecessary duplication of infrastructure that is so evident in both the cellular mobile and Internet sub-sectors in Zambia. Instead, the ICT policy must be seen to encourage the integration and sharing of existing networks to optimize capacity utilization.

The new ICT policy must promote a pro-competitive regulatory environment that encourages fair play among the competing operators and reduces the high cost of doing business in Zambia through lower prices. The new ICT policy must include a universal access objective to make ICT services more widely affordable. The ICT policy must also be pro-active in stimulating increased demand so that operators have economic incentives to invest in the expansion and modernisation of their networks and services.

The ICT policy must give special attention to the development of the required human resource. By its nature, knowledge to develop and use ICTs is embedded in individual human beings. The development of required human, intellectual and social capital is therefore critical if Zambia is to avoid further marginalisation in the global economy

As Alison Gillwald observes: “A national information infrastructure will not arise without the public sector capacity to develop appropriate policies, to implement them effectively, or to regulate the market efficiently. Nor will it without citizens and consumers with the skills to utilize their access to it or without innovators and entrepreneurs to devise ways of getting it affordably to the remotest parts of the country or to compete in global markets”[†]

These diverse ranges of success factors, together with the crosscutting issues, require that every ICT initiative in the country must be part of a broader integrated ICT policy, ensuring co-ordination of sectoral policies and strategies at the highest level.

^{*} Movement for Multiparty Democracy(MMD), which has been in power since the re-introduction of multi-party democracy in 1991.

[†] Ibid.

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