

ICT Investment Opportunities in East Africa

Country Specific Market Analysis Tanzania

October 2004

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Context

This country report is one of four produced for the International Finance Corporation (IFC) summarizing the results of a feasibility study into investment opportunities in the ICT sector in four East African countries: Kenya, Uganda, Tanzania and Mauritius. A separate regional report has been produced that consolidates the findings from the four countries and looks at the overall key trends and market opportunities. There is also a confidential report on potential investment possibilities, based on interviews and discussions with business people and public sector officials.

The four country reports present an overview of the current situation in the information and communications technology (ICT) sector in each country, and include information on the economy, education, policy and regulatory environments, status of specific ICT markets, challenges and concerns and potential market trends likely to rise, and investment opportunities.

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LIST OF ACRONYMS

APC	Association for Progressive Computing
ATM	Automatic Teller Machine
BMTL	Business Machines Tanzania Limited
BPO	Business Process Outsourcing
BSc	Bachelor of Science
CATS	Computer and Telecommunication Systems Ltd
CC	Computer Center
DIT	Dar es Salaam Institute of Technology
DSE	Dar es Salaam Stock Exchange
EARPTO	East African Regulatory, Postal and Telecommunication Organizations
EPBX	Electronic PBX
EPZ	Export Production Zone
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
HIPC	Heavily Indebted Poor Countries
ICL	International Computers Ltd
ICT	Information Communication Technology
IMF	International Monetary Fund
ISP	Internet Service Provider
IT	Information Technology
IXP	Internet Exchange Point
LAN	Local Area Network
MCSE	Microsoft Certified Systems Engineer
MICR	Magnetic Ink character Recognition
MUCHS	Muhimbili University College of the Health Sciences
PABX	Private Automatic Branch Exchange
PC	Personal computer
PCO	Public Call Office
PRS	Poverty Reduction Strategy
PRSP	Poverty Reduction Strategy Paper
PSRC	Parastatal Sector Reform Commission
SAFE	South Africa Far East
SDH	Synchronous Digital Hierarchy
SMS	Short Message System
Tanesco	Tanzanian Electric Supply Company Limited
TAS	Tanzanian Assistance Strategy
TBC	Tanzanian Broadcasting Commission
TCC	Tanzanian Communication Commission
TCCIA	Tanzanian Chamber of Commerce, Industry and Agriculture
TCRA	Tanzania Communications Regulatory Authority
TIC	Tanzania Investment Center
TIX	Internet Exchange Point
TPB	Tanzania Postal Bank
TPC	Tanzanian Postal Corporation
TPDF	Tanzania People's Defence Force (the army)
TPTC	Tanzania Posts and Telecommunications Corporation
TRASA	Telecommunication Regulators Association of Southern Africa
TRP	Telecommunications Restructuring Programme
Tshs	Tanzania shillings
TTCL	Tanzanian Telecommunications Company Limited
UDSM	University of Dar es Salaam
UNDP	United Nations Development Program
VoIP	Voice over Internet Protocol
VSAT	Very Small Aperture Terminal
WAN	Wide Area Network
ZANTEL	Zanzibar Telecom Limited

1. Tanzania Today

“Tanzania is a country of paradoxes. On the one hand the economic climate has improved, but on the other hand severe poverty persists. Multi-party democracy has been introduced, but poor people still have few chances of influencing their own futures.”

Sida’s Country Strategy for Development Cooperation, 2001-2005

Officially *the United Republic of Tanzania*, this East African country lies immediately south of the equator and covers an area of 945,000 square km. Dar es Salaam is the largest city and the commercial capital. About five hours by road west is Dodoma, the capital city and seat of government. Facing the Indian Ocean on the east, Tanzania is bordered by Malawi and Mozambique in the south; Zambia, Zaire, Burundi, and Rwanda in the west; and Uganda and Kenya in the north. The outlying territories comprise the islands of Zanzibar, Pemba, and Mafia. As of July 2004 the country’s population was estimated as 36,588,225 and growing at close to 2% a year.¹



Map of Tanzania²

¹ <http://www.cia.gov/cia/publications/factbook/geos/tz.html>

² <http://www.cia.gov/cia/publications/factbook/geos/ug.html>

Tanzania remains one of the least urbanized African countries; the urban population is approximately 23%. Dar es Salaam accounts for nearly one-fifth of the total urban population. Administratively the country has twenty-five regions, each comprising 3-8 districts making up a total of 120 in all. There are about 9000 villages with an average of 3000 inhabitants each.

Tanzania is one of the poorest countries in the world. Per capita income in 2004 is estimated to be at about US\$290.³ As is typical for developing countries, however, the per capita GDP is probably understated because of the large size of the informal sector, the fact that Tanzania is largely a cash-based economy, and is further compounded by the difficulty—common to most developing countries—of obtaining accurate and up-to-date information.

The Bank of Tanzania (the central bank) in its Monetary Policy Statement dated June 2004 noted that the overall performance of the economy during 2003/04 was generally satisfactory, despite the severe drought that adversely affected food supplies and hydroelectricity generation. Preliminary National Account Statistics indicated that real GDP grew at 5.6 percent in 2003, slightly above the revised projected growth of 5.5 percent, and below the 6.2 percent recorded during 2002. The overall annual inflation rate increased from 4.4 percent as at June 2003 to a peak of 6.5 percent in April 2004.

With respect to macroeconomic objectives, the main focus of government policies during 2003/04 as set out in the Poverty Reduction Strategy (PRS) was to promote growth and strengthen poverty reduction policies, while consolidating and maintaining macroeconomic stability. To attain these objectives, the Government aimed at a real GDP growth of 6.3 percent in 2003 and 6.6 percent in 2004; a revised inflation rate objective of 5.0 percent by end-June 2004, raising government revenue to 13.3 percent of GDP, and maintaining official foreign reserves of not less than six months of imports of goods and services.

Despite the economic and developmental challenges, it is noteworthy that Tanzania is politically one of the most stable countries in Africa.

With foreign debt in excess of 80% of GDP in the late 90's, Tanzania was one of the so-called Heavily Indebted Poor Countries (HIPC). To receive interim debt relief the country had to undertake certain activities, including a Poverty Reduction Strategy now embodied in its Poverty Reduction Strategy Paper (PRSP), first presented to the IMF in 2000. In November 2001, Tanzania was the fourth country to reach the Completion Point for debt relief under the enhanced HIPC. Since then the Government of Tanzania has regularly updated its PRSP.

In 2000 agriculture accounted for nearly two thirds of GDP and over 80% of the workforce and export earnings (predominantly crops, fishing and livestock). In 2003 the figures were estimated as follows: agriculture: 43.6%, industry: 16.5% and services: 40%, indicating that the economy has become more broadly based both from a sectoral and geographic perspective. The Tanzanian Planning Commission states that investment performance is strengthening with a marked increase in capital projects in Dar es Salaam and other regions. Manufacturing contributes less than 10% to GDP, but growth is quite high relative to other sectors, mainly due to a rapid programme of privatization of state assets under the direction of the Parastatal Sector Reform Commission (PSRC).

³ <http://www.worldbank.org>

Telecommunications, Mining and Tourism are three other small, but rapidly growing economic sectors.

In 1999 the Tanzanian Planning Commission published the Tanzania Development Vision 2025. That document, together with a more recently produced Tanzania Assistance Strategy and the Poverty Reduction Strategy Paper comprise the top-level national guidelines that direct government activities. In particular the Vision 2025 document is refreshingly candid and realistic. Rather than setting impossible goals, it calls for Tanzania to graduate from a least-developed country to a middle-income country by 2025; to transform from a low productivity agricultural economy to a semi-industrialized one. At the same time it notes several impediments:

- A donor dependency syndrome and a dependent and defeatist developmental mindset;
- A weak and low capacity for economic management;
- A failure in good governance and in the organization of production; and
- An ineffective implementation syndrome

With regard to the last point, it expresses the concern that people are now less enthusiastic about participating in national endeavours: “Apathy has set in.”

A recent Reuters press article by a Tanzanian journalist spells out concerns of the business community. It suggests that

“Despite winning plaudits for liberalization, Tanzania’s top civil servants and some of its politicians are reluctant pro-marketeters, secretly wedded to much of the African socialism of ... Julius Nyerere while turning a blind eye to corruption.”

Big businesses complain that the need for a streamlined tax system and modern market regulatory systems have been ignored and small businesses suffer from petty corruption and a slack market. The Chairman of the Tanzanian Chamber of Commerce, Industry and Agriculture (TCCIA) is quoted as saying:

“Private enterprise is struggling very badly. We need to streamline a host of nuisance taxes and levies to help us survive.”

Vision 2025 and the other documents referred to, address these concerns and call for

- A Developmental Mindset and Empowering Culture;
- Competence and Competitiveness; and
- Good Governance and the Rule of Law.

In particular, the promotion of science and technology education and ICTs are highlighted as key strategies to realize competence and competitiveness. Vision 2025 states “ICTs are a major driving force for the realization of the Vision.”

2. General Market Conditions

2.1 Overall State of Technology

From 1990 when the import of computers was prohibited, the country was suffering a decaying phone system and had no data communications. Now Tanzania enjoys a healthy ICT sector, a strong rollout of data communications into rural areas, effective international data communications, and significant public internet access. For several

years ICT has represented a significant focus of the Tanzanian Government. Of particular note were the creation of the Tanzanian Communication Commission (the regulatory authority) in 1993, the publishing of the National Telecommunications Policy of 1998 and the recent ICT policy adopted by Cabinet in 2003.

The partially state-owned Tanzanian Telecommunications Company Limited (TTCL) has and will maintain its monopoly over fixed line voice communications until early 2005, although recently partly privatized with the sale of a 35% stake to an international consortium. As of 2002 the telecommunications infrastructure comprised 12 mbps of international linkage and a national backbone that has grown rapidly to approximately 40 mbps as a result of the recent rollout of two- mbps links to the 22 “first-tier political subdivisions.” In a very competitive market and typical of Africa, the spread of mobile networks has been phenomenal, with mobile users exceeding fixed line users after only a few years of operation. In 2003 there were about 250,000 internet users in Tanzania, accessing the web via home and business accounts, but more importantly through a proliferation of cybercafés. There are some twenty-one Internet Service Providers serving the country and 15,000-20,000 dialup accounts. Recently the first Internet Exchange Point went live, linking some of the major ISPs.

2.2 Policy and Regulatory Frameworks

2.2.1 Telecommunications Policy

The Tanzania Posts and Telecommunications Corporation (TP&TC) was the exclusive provider of telecommunications and postal services before 1993 and also regulated the sector, including radio frequency spectrum management. TPTC operated as a state monopoly, and the Ministry for Communication and Transport was responsible for both sector policy plus some regulatory functions.

Following the Tanzanian Communications Act of 1993, TP&TC was dissolved and replaced by the Tanzania Telecommunication Company Limited (TTCL), the Tanzania Postal Bank (TPB), the Tanzania Postal Corporation (TPC) and the Tanzania Communications Commission (TCC), with the latter being responsible for the regulation of postal and telecommunication services.⁴ Taking cognizance of convergence, effective November 2003 the new Tanzanian Regulatory Authority Act merged the TCC and the TBC (Tanzanian Broadcasting Commission) forming the Tanzania Communications Regulatory Authority (TCRA) which became operational on 1 November 2003.

The Chairman, Vice Chairman and four members of the Board of the Tanzania Communications Regulatory Authority (TCRA) were appointed effective April 29, 2004. The TCRA Chairman is Ambassador Richard Elisante Mariki and Vice Chairman is Ms Amina Mrisho Said. The two were appointed by President Benjamin Mkapa. The four board members were appointed by the Minister for Communications and Transport, Professor Mark Mwandosya and they are: Dr. Suleiman Juma Omar, Dr. Vuai Iddi Lila, Dr. Batilda Burian and Mr. Baruany Elijah Luhanga. In mid 2004 the Minister of Communication and Transport Prof. Mark Mwandosya appointed Prof. John Nkoma, the Director-General of TCRA. All other posts in the organization are currently being filled, with all incumbents applying for their original or other posts.

⁴ The Regulator (Quarterly Newsletter of the TCC), April-June 2001

The TCRA/TCC has participated in, and is a member of the Telecommunication Regulators Association of Southern Africa (TRASA) and the East African Regulatory, Postal and Telecommunication Organizations (EARPTO). The EARPTO consists of three members (Tanzania, Kenya and Uganda) and is promoting cooperation in areas such as:

- Regional quality of service standards;
- Staff exchange and training;
- Type-approval procedures and standards; and
- Co-ordinating a Regional position in International forums.

TCRA was established through the Tanzania Communications Regulatory Authority Act No.12 of 2003 and has effectively taken over the functions of TCC and TBC. All licences and permits granted by the TCC and TBC and any agreement entered with the two bodies are valid and shall remain in force until they are revoked, annulled or replaced. Membership of the two bodies to international and regional organizations and will continue under TCRA.

Two operators are currently licensed to provide basic telephony and international gateway services – TTCL (mainland) and Zantel (islands that comprise Zanzibar only). TTCL has recently been partially privatized with the sale of a 35% stake for US\$120-million to a consortium consisting of Detecon of Germany and MSI of the Netherlands; TTCL was then granted a four-year exclusivity period along with a requirement to meet obligatory installation targets or face financial penalties from the regulator. This exclusivity is primarily focused on the provision of basic telephony services on the mainland and providing international gateway connections for all operators on the mainland. The exclusivity period expires on February 22nd 2005. Observers are with great interest watching for the possibility of an entirely liberalized telecommunications sector post-TTCL exclusivity with the entry of a duopoly at the very least.

The industry has been liberalized to some extent in that the TCRA has issued licences to provide Public Data Communication services in Tanzania to six companies, although not all appear to be active. The licence essentially allows these companies to provide infrastructure for use by other service providers (e.g. internet service providers) or companies. There are an additional 10 Private Data Communications Licences that have been issued. There are twenty-one licensed Internet Service Providers in Tanzania and four mobile operators (Mobitel, Celtel, Vodacom, and Zantel). The mobile telephony sector has shown explosive growth with the recent entry of Vodacom, a South Africa-based company, into the market in 1999, and subsequently with Celtel's entry in 2001. Celtel International is the largest mobile service provider in Africa outside of South Africa.

2.2.2 The Telecommunications Regulatory Environment

The telecomm regulatory situation in Tanzania is going through a period of rapid and positive change. As mentioned, the Tanzanian Regulatory Authority Act 2003 merged the TCC and TBC to form the TCRA. According to Dr Ray Mfungahema of the TCRA, the TCC and TBC Acts are being repealed and proposals for new legislation and licensing regime are underway. Already there is a better process for selecting board members. New subcommittees have been created and a Review Panel and a ten-member Consumer Consultative Council were inaugurated on July 16 2004. The objectives are to improve dialogue and protect consumers. As a matter of interest, in a recent development Vodacom attempted to use its market dominance and other advantages to refuse to accept the interconnection determination that had been accepted by all other players in the

telecoms sector. A separate and independent enquiry supported by the TCRA's Consumer Consultative Council into the validity of Vodacom's claims has resulted in a highly public and transparent process whereby consumer interests appear to be being addressed for the first time in this manner.

With regard to cyberlaws, the Tanzanian Law Reform Commission is actively assessing sector-specific laws as they relate to ICT and e-commerce with a view to amending or repealing relevant aspects, and preparing to create new laws as required.

February 22, 2005 is a critical date when the TTCL monopoly expires. Amendments to the Telecommunications Act are likely by year-end and will provide a framework to manage the way forward. The amended act will open the way to a duopoly or oligopoly in the communications arena. It will also be technology neutral.

One of the fundamental aims of the new telecommunications regime is to increase points of presence in rural areas. The existing rural telecommunications fund has been dormant but will be triggered with a kitty of approx. \$300 million. There are currently about two million citizens who can access telecomm facilities; the expectation is that the proposed changes will open up telecomm to 5-6 million people.

The interconnection regime is also changing. Allegedly, the existing, large operators have been making super profits with the old high interconnection charges. Effective Aug 1 2004, TCRA requires the interconnection fee to drop from 17.5 to 10 cents (used to be 25 cents). A recent Analysys study proposed future fees that should be based on long run incremental costs with a progressive reduction to 5 cents over four years (in 2008).

Key issues spelled out by the TCRA are: finalization of the new regime, licensing after the exclusivity period; linking schools and hospitals; putting the rural fund in place to help the most alienated sectors; and strengthening infrastructure.

The continued liberalization in the telecomm arena will lead to new players, international gateway operators in particular. The extension of the submarine cable to Tanzania is a key and major project and is expected to make call centers and BPO attractive in Tanzania. It was suggested during the interview process that investment in cable landing points and supporting a regional IXP might be attractive possibilities for the IFC.

One of the contentious regulatory issues in Tanzania has been Voice over Internet Protocol (VoIP). Although illegal, there is much evidence of such activity taking place in Dar es Salaam. According to the TCRA, this will cease to be an issue with the new Act.

Significantly, senior management of companies interviewed during the survey whose companies have a presence in Uganda and Kenya felt strongly that while the regulatory environment in Tanzania is not entirely satisfactory, it is far superior than elsewhere in East Africa. At least two CEOs indicated that their preference would be to invest in new projects in Tanzania rather than elsewhere. The CEO of Celtel Tanzania also expressed satisfaction with the regulatory regime in Tanzania.

2.2.3 Overall ICT Policy

The need to develop a policy that addresses the ICT Sector as a whole was identified some time ago. Interestingly the initiative to take the process forward initially came from an informal grouping called eThinkTank, a forum supported by the United Nations Development Program (UNDP). Their stated objective was to 'present the public and Gov-

ernment with ideas and suggestions to help the country into the information age.⁵ Mainly via an electronic list server, businessmen, government employees, academics and donor organizations exchanged ideas and helped to initiate programs targeted at the ICT Sector. On October 19 2001 the group held a public forum where it tabled Terms of Reference for the development of an ICT policy, including the drafting of suitable legislation. Tanzania's policy makers supported the initiative. They took on the policy process and formed a broad-based Task Force under the Ministry of Communications and Transport that finalized the drafting of the first National ICT Policy in August 2002. This comprehensive document covers topics such as the Legal and Regulatory Framework, Capacity Building, ICT Infrastructure, the ICT Industry, Productive Sectors, Service Sectors, Universal Access and Local Content. Government adopted the policy in 2003 and significant benefits are expected once it is implemented. Among other things, it is expected to pave the way for an eGovernment strategy as well as for sector-specific implementation plans that will be manifested through continued diffusion of the internet. An interview for the current project with Mr. August Kowero, national ICT coordinator for government, suggests that the implementation process will take a long time.

2.3 ICT demand: Public and Private Sectors

2.3.1 Public Sector - Major Users

Tanzania has made good progress in reforming the Public Sector since the introduction of market-oriented reforms in 1986 and particularly since the move to multi-party democracy in 1995. Initiatives such as the Tanzanian Assistance Strategy (TAS)⁶ aimed at restoring local ownership and leadership, Vision 2025 which aims to move Tanzania to a middle income country by 2025, and public and parastatal reform programmes,⁷ have collectively resulted in the privatization or divestiture of nearly 200 parastatals,⁷ and substantial reductions in numbers of government employees.

2.3.2 Parastatals

The largest parastatals such as the Tanzanian Electric Supply Company Limited (Tanesco) and the Tanzanian Telecommunications Company Limited (TTCL) have either undergone partial privatization or plans are well under way to effect this. The Tanzanian Government tasked the Parastatal Sector Reform Commission in 1998 to sell 100% of Tanesco to various investors. This process had not been completed at the time of this report.

Apart from TTCL, which is a part of the ICT Industry, parastatals such as Tanesco and the Bank of Tanzania (Central Bank) are large users of ICT. The Bank of Tanzania, for example, employs over forty ICT professionals and has a network of over 750 personal computers. The bank is presently engaged in the implementation of an Electronic Funds Transfer system, an Electronic Clearing House system and a Smart Card project. MICR on cheques has been introduced, although the impact on the economy overall is likely to be low given the largely cash-based nature of Tanzania's economy.

⁵ www.ethinktanz.org

⁶ Tanzanian Assistance Strategy, Consultation Draft 1, Ministry of Finance

⁷ *Ibid*, p 3

2.3.3 Government

There are nineteen ministries in the Government as well as seven Ministers of State outside the basic functional hierarchy, responsible for particular aspects of government (e.g. Planning and Sector Reforms). Central government departments and key government and parastatal agencies have local area networks and internet connectivity. Tanzania has not yet, however, emphasized the developmental importance of ICT by creating a separate Ministry of Communications (let alone a Ministry of Electronic Commerce, as some countries have done); presently telecommunication matters fall under the Minister of Transport and Communications.

Tanzania currently has 25 administrative regions (5 on Zanzibar) and 113 administrative districts. Recently, a decentralized government structure was adopted but operations remain predominantly centralized. The level of automation remains low and is exacerbated by shortages of skills, equipment and money.

2.3.4 Other Public Institutions

The University of Dar es Salaam is a significant user and generator of ICT skills, with a number of well-equipped computer laboratories, a hundred students graduating in Computer Science every year and many more attending various diploma courses.

Twenty-eight buildings on the Dar es Salaam campus are connected via a high-speed optical fibre backbone and internet access is provided via a VSAT link. Two other campuses are connected by wireless links to the main campus.

With the exception of the University of Dar es Salaam and the Sokoine University of Agriculture, however, there is minimal computer and internet usage in schools and the tertiary educational sector.

In the health sector, the Muhimbili University College of the Health Sciences (MUCHS) was one of the earliest users of the internet in Tanzania and it continues to make use of the internet for telehealth purposes. In addition the Aga Khan Hospital has a new facility for using the internet for limited telemedicine applications.

2.3.5 The Private Sector – Major Users

Several large companies have local area networks and internet connectivity, but the same does not apply to large numbers of small and medium-sized public and private institutions throughout the country, that lack electricity, let alone computers and connectivity. The growth of ICT in Tanzania is clearly dependent on the growth of the private sector as a whole, but this growth is slow due in part to the cost of establishing a business, accessibility of medium and long-term loans, and costs of production. These problems have been discussed at widely, and encouraging steps were taken in a recent budget, including the elimination of import taxes on computers and the scrapping of a 'start-up' tax on new business.

There are no large users of ICT in the private sector in the sense of networks of thousands of on-line terminals; probably the most progressive users are concentrated within the banking industry.

2.3.6 Banking Industry

There are eighteen Registered Commercial Banks in Tanzania, including Standard Chartered Bank, Stanbic Bank, Citibank, NBC Bank, CRDB Bank, Barclays Bank of Tanzania

and Kenya Commercial Bank. Although this sector is probably more automated than any other in Tanzania, there are few ATM's in evidence and interoperability between banks through a common network has not been implemented.

2.4 Industry Capabilities

Reliable statistics on the overall ICT sector are not available, but the size of the industry is probably between US\$ 300 - 350 million. The major players are TTCL and the mobile phone operators. The overall growth of the industry is probably in excess of 25% p.a., fuelled by very buoyant sales in the cellular industry. There is no manufacturing of equipment in Tanzania, and little assembly.

The removal of all taxation on computers and peripherals in July 2000 was the first in the region. This resulted in neighbouring countries procuring ICT equipment through Tanzania spurring growth of system integration companies. Noting that Tanzania has eight neighbouring countries this had significant impact on the capacity of the ICT suppliers. In addition the significant reduction in cost of locally available ICT equipment brought new equipment within the reach of a significant number of smaller private sector firms and branches of government, further increasing the capacity of the local ICT suppliers.

2.5 Obstacles to Growth

Despite improvements in the communications infrastructure, it is still substandard for the purposes that would allow various network-dependent business models to flourish. Major leaps have been made in mobile telephony, but at the same time various factors have meant that the subscriber base of the fixed line network has been declining steadily since the partial privatization of TTCL. In addition the fact that TTCL declined to make the investments to meet their significant roll-out targets during the four-year exclusivity period (810,000 new lines and two telephones in each village with more than 2,000 residents) has increased the importance of mobile telephony in increasing teledensity in Tanzania. Notably one of the arguments behind giving TTCL the concession to exclusivity for four years was to justify the exclusive revenue generation that would then fund its country-wide roll-out obligations. This has not happened.

The regulatory situation needs to be shaped and clarified in a way that will allow fair competition in various services, not only in mobile, to take root, so implementation of the proposed amendments to the Telecomm Act is very important. Major service rollouts to schools, both in terms of connectivity and computers, need to be accomplished. This is mandatory if the country is to produce graduates who are employable and able to fulfill the requirements of the productive sector.

Other obstacles include:

- The taxation system is cumbersome, costly to administer and unfriendly towards small companies.
- No tax breaks are available for companies wishing to innovate in this sector.
- The significant lack of finance for ICT projects for a number of reasons hampers investment in innovative projects.
- The price of some basic services (e.g. electricity) is very high and is not regionally competitive.
- Some of the key services, such as electricity and water, are very unreliable
- The availability of suitably skilled staff is a problem, although there may well be an oversupply at the lower skilled levels.

- Corruption in the awarding of Government Tenders is prevalent, but this situation is seen to be improving.

2.6 Internet Penetration Levels and Affordability

Tanzania has had at least rudimentary internet access since 1990. Until recently, internet use has been confined largely to Dar es Salaam, and, characteristic of most African countries, only a small minority of the population has access. Lately, however, there is evidence of quite rapid growth. For instance, international internet bandwidth trebled to twelve mbps from 2001 to 2002, and at the same time there has been a rapid expansion of the national network that now includes all twenty-two first-tier geographic regions and some districts. This connectivity certainly offers opportunities for businesses, local government and private citizens to gain access to the internet, but as yet there is little traffic.

Dialup subscriptions have grown rapidly in the last two-three years and there has been a proliferation of cybercafés providing public access to the web. Impressive as this may sound, however, the absolute numbers of users (est. 250,000 in 2003) remain quite small.

There have been some new and innovative methods of internet access including 802.11 and other wireless line-of-sight and non-line-of-sight services increasing the reliability of access. However the cost of these services has typically been too high for small businesses and home users.

Tanzania lacks a direct landing point for the internet. Data service providers connect to the internet via satellite in countries as diverse as France, Norway, the UK and the USA. Today, collectively this bandwidth amounts to only a claimed 24 Mbps. There is an internet exchange point (TIX) that keeps local traffic local. However while eight of the largest ISPs have connected to TIX, the absence of TTCL on this service means the majority of Internet Cafés country-wide are not connected to TIX. This is an adverse situation that needs to be rectified.

2.7 Human Resources/ICT Education

This section examines the ICT human resource situation in Tanzania from two perspectives: the so-called “education pipeline” that considers the passage of children from primary school through to tertiary education, and the training of ICT technicians and professionals.

2.7.1 The Education Pipeline: Primary and Secondary Schools

Primary and secondary education clearly constitutes the crucial foundation for the university work needed to produce ICT professionals as well as competent users of ICT. A 2001 report on the state of education in East Africa draws on current statistics for Tanzania, Kenya and Uganda, as well as interviews in each country and a closing stakeholder workshop. It paints a bleak picture:

“The educational pipelines in Kenya, Tanzania and Uganda are in a state of crisis. They are deeply inequitable and of extremely poor quality. Government commitments to provide quality education for all have not been met. Educational opportunity is highly stratified, decent schooling is increasingly the preserve of a small elite, and current practices reinforce and intensify existing disparities in all three East African countries.

There are deep disparities across sex, income levels, religion, ethnicity and geography. These differences are present at the primary level, and become pronounced further up the pipeline. Studies indicate that recent policy changes including economic liberalization may in fact intensify inequities.

The select few who make it to university or other higher education institutions find themselves without the language and analytical skills necessary for rigorous academic study and without the practical and inter-personal aptitudes needed to thrive in a pressured social environment. In part, this turns universities into “glorified secondary schools” where teachers are forced to perform remedial education functions for which they are neither suited nor prepared.”⁸ There is little evidence that things have changed substantially since the writing of that report.

While statistics for the specific additional facilities needed for ICT-related education are not available, interviewees for the current studies noted that only a very small proportion of schools had electricity and even fewer had telephones. There are a number of computers in Tanzanian schools, however these are mainly restricted to high-cost private schools. The Education Sector Development Programme that is the overarching programme driving education sector reforms does not have a specific element in it with respect to implementing ICT in government schools. This means that the majority of learners in the country are not involved in a strategic or methodical approach to being involved in ICT whether from the perspective of computers in schools, but more importantly in curricular reform and ICT curricular integration. In brief the outlets on the education pipeline are not meeting the current needs of the business community or other learning institutions.

Almost all primary schools are public, while nearly half of the country’s 826 secondary schools are privately run. There are two types of private schools—a few relatively well endowed near the big cities—and the majority quite poor and often in even worse shape than the public schools.⁹ The cost of tuition in the well-endowed private schools (the so-called “international schools”) is extremely high—annual fees of several thousand US dollars per child were mentioned.

There are very few computers in schools, as noted above. Most computer access is confined to the private/elite schools, thus exacerbating the inequities. Despite this, an as yet unofficial syllabus for computer training for standards 4-7 has been produced. It implies hands-on use of computers and the internet from standard four onwards—operating a PC, using Windows, sending email and accessing the internet. There is also an official secondary school Computer Studies syllabus for forms 1-4. It was developed in 1996 (superseding an earlier one prepared in 1993), and issued in 1997. Essentially the syllabus describes a compulsory computer literacy course in forms 1 and 2 (file management, word-processing, data base and spreadsheets), and an optional course in BASIC programming in forms 3 and 4. There is, however, no evidence that anyone is taking these courses and faculty at the tertiary level made it clear that their incoming students had minimal if any knowledge of computers.

⁸ Rakesh J Rajani, *The Education Pipeline in East Africa*, A Research Report and Synthesis of Consultations in Kenya, Tanzania and Uganda, May 2001 (unpublished). Sponsored by the Ford Foundation.

⁹ Rakesh Rajani, private communication.

2.7.2 The Education Pipeline: Colleges and Universities

Both the University of Dar es Salaam (UDSM) and the Dar es Salaam Institute of Technology (DIT) offer heavily subsidized public education opportunities for students interested in ICT. It is noticeable that the offerings of these two institutions are starting to overlap, in that UDSM is starting to offer diploma courses in addition to its traditional degree courses, while DIT is starting to offer B Tech degrees in addition to its traditional certificates and diplomas.

University of Dar es Salaam

Founded in 1961, UDSM is the major tertiary level institution in Tanzania. It has twelve faculties and eleven institutes as well as two colleges tackling land and architectural studies and health sciences respectively. 2000/2001 figures indicate that faculty level at the main campus was 579 (11% female) and they served 6084 students (24% female). However overall numbers of students and the gender balance have been steadily improving. For the 2004/05 academic year, a total of 2050 students have been recommended for admission in the various academic units. Of these 1213 were male and 837 female.

On the main campus an important unit is the Computing Center, which provides connectivity and internet access to all UDSM entities. UDSM is also an African Virtual University node. There are also several computer labs used for computer training and executive courses for government and private sector officials.

The Faculty of Sciences has a Computer Science Department that offers a BSc (Computer Sciences). It has also started a degree programme in Computer Engineering. The department has an up-to-date computer lab that is well used. The faculty graduated its first twenty-five computer science students in 1999. According to a 2002 faculty survey, most graduates were still in Tanzania, working mainly in the private sector in computer, data communications and internet service firms. Typical jobs were network controller, systems administrator, software development, web site design, and internet service provider.

In 2000 the department admitted 80 computer science students and geared up for 120 in 2001. Only 65 students were accepted however. In 2001 the new BSc in Computer Engineering and Information Technology offering had 40 computer engineers and 30 telecomm engineers enrolled. At present the bachelor's degree course in computer science admits 100 new students each year with a 95% graduation rate. It is noteworthy that a significant number of perspective new students qualify for admission, but cannot be accommodated in the limited facilities in the Computer Science and Engineering Faculty. For the current academic year, there were over 300 qualified applicants for the computer science degree course. However, lack of facilities meant only 100 or so could be admitted. There are plans underway to expand the faculty further in order to meet rising demand.

UDSM has introduced online learning through its' system TEIL. While there are teething difficulties with respect to stability of the system and educational content, it is viewed to be making a positive impact since all students, through computer labs, have online access.

UDSM has identified a gap in the market for ICT professionals and is targeting qualifications such as Cisco, MCSE and RedHat, where students will take external examinations.

It has commenced a nine-month networking diploma course based on the Cisco syllabus and has forty students enrolled. It is also planning a software development diploma based on Oracle certification. All students in Science, Law and Engineering have to take a computer literacy course. The university is also active in the Open Source arena and is presently finalising the “localization” of Linux and other open source applications by translating them into Kiswahili. This localization project is expected to enable many more Tanzanians to become computer users as the language barrier gets removed.

Dar es Salaam Institute of Technology

The DIT has evolved from the 1957 Dar es Salaam Technical Institute, which in itself became the Dar es Salaam Technical College in 1962. An Act of Parliament established the DIT as an autonomous parastatal in 1997. DIT’s vision is to become a center of excellence in the fields of applied science and technology. In addition to civil, electrical and mechanical engineering, DIT has a Department of Computing offering a three-year full technician’s course in computer engineering and a Department of Electronics and Telecommunications Engineering offering a three-year full technician’s diploma and an advanced diploma in electronics and telecomm engineering. Firms such as TTCL, Celtel and Vodacom target DIT students as their new recruits. The first computer-engineering students graduated with diplomas in 2002. DIT also has a Department of Continuing Education that, among other courses, offers professional development programmes in computer repair, computer networking and end-user computing courses. All told, DIT has 121 faculty, 1,300 fulltime and 2,400 part time students.

DIT offers short courses for technicians through to advanced diplomas in technology related fields including computer science. At present DIT does not offer degree courses, however the act that established it as an autonomous parastatal envisages it to become a full technical institute in the near future offering specialized technology and engineering courses. This year DIT intends to begin offering a bachelors degree in computer engineering. It already has about 30 qualified applicants. In addition its advanced diploma in computer science admitted 32 new students this year (25 being government-sponsored) with 28 graduating, while its “IT Fundis” course (a computer technician course) admitted over 50 this year with 42 graduating. DIT’s major constraint is space. It is searching for alternatives for expansion, even including moving wholesale to new premises or vertical expansion of existing buildings. Once the space constraint is resolved it expects to admit significantly more students since demand is extremely high and cannot be met at present.

DIT has very limited but improving computing facilities including a general computing lab. It does however have a detailed three-phase design for a LAN, a leased line link to TTCL and a fibre backbone.

2.7.3 Private Training Institutes

There are several private firms offering computer courses in Dar es Salaam. Largest of all is SoftTech that at any one time can seat 600 students at their own PCs in its new training facility. The SoftTech Group of Companies began operating in 1993 and provides many ICT related services.

Aptech, which has franchises for international offerings from SofTech, NCC Education Services, Vue, Sylvan Pro-metric and other providers has about 150 PCs spread across several training laboratories.

Another large provider is CATS, which was founded in 1987 (out of the original ICL computer company). The company sells hardware and software, develops bespoke applications, runs an ISP and offers engineering services such as a/s maintenance support and networking solutions. CATS's training division claims to have trained 10000 people to date. It has several training labs and offers a range of certificates, diplomas and advanced diplomas. Groups such as the UK-based IDPM, Microsoft and Sylvan Pro-metric have accredited the company.

There are several other smaller training firms in Dar es Salaam, some of whom are accredited by NIIT in India and NCC Education Services. One of note is the Tanzania Public Service College, which has transformed itself from a state organ to a private training college and is currently designing and launching a series of computer training courses.

A concern voiced by many employers particularly in the private sector is there is no regulation of the quality and content of the courses administered by these ICT training firms. Poor quality outputs with valid certificates of competence have flooded the employment market and this is considered to be a significant problem.

2.8 Competition

Competition has been limited by TTCL's monopoly. In contrast there is healthy competition in the ISP market, evidenced by prominent advertising in the marketplace. The small size of the market limits the opportunities for new entrants, however, and the existing smaller operators are looking forward to the February 22, 2005 expiration of TTCL's exclusivity concession. They are devising plans for new product and services and are in the process of raising financing to be able to move quickly with their expanded business plans when the time comes.

The impressive developments in the regulatory environment have instilled optimism among many small entrepreneurs. Now it is significantly easier for small businesses to venture into the ICT sector than just a couple of years ago. Nevertheless, the regulator still needs more teeth to be able to safeguard consumers, which can only be achieved with greater political will.

There are some foreign firms, especially from South Africa, and from other East African countries, Kenya and Uganda, that have entered the telecommunications and IT market in Tanzania. With continuing regional integration it is foreseen that the trend will carry on and grow as it becomes easier to navigate the administrative corridors and as organizations gain more experience from regional operations.

2.9 Capital and Financing

As in most other countries in Africa, obtaining financing is a major impediment to growth for technology companies. The banking sector is well represented in Tanzania. There are 28 registered banks and lending institutions with several hundred branches across the country. Tanzania Postal Bank has 160 branches and CRDB has 35 branches. The National Micro Finance Bank alone has 300 outlets although they are not full-fledged branches. There is only one bank with investment banking activities in Tanzania, the ABC Bank, which has dual headquarters in Botswana and Zimbabwe. It has worked with the IFC on some tourism-related projects. ABC Bank has gone through a series of mergers recently, the latest being one with Capital Finance Limited at the end of July 2004. They provide leasing and commercial banking services and say that they would

lend US\$250,000-300,000 to an ISP for example, against future revenues on existing contracts with perhaps 10-15% cash deposit requirement.

There are no venture capital funds in Tanzania. An early Tanzanian Venture Capital organization transformed into Fedha Fund, which was then taken over by Aureos Capital, lost its VC focus. Aureos Capital is a private equity fund, which is not interested in technology firms because of their stated view of the high risk involved and because the market has not yet matured enough. Their minimum investment starts at about US\$300,000-400,000. The ABC Bank expressed an interest in a possible joint VC fund between the IFC and the ABC Bank.

Historically, the Tanzanian private sector is very young. Until 1986/87 no “excess” assets were allowed and those were nationalized, for example individuals with two homes often lost their second property to nationalization. The Dar-es-Salaam Stock Exchange (DSE) has six companies listed and it is not an appropriate financing vehicle for SMEs. There is a clear need for a second, smaller market for small firms, which the DSE has recognized and is examining possibilities to create a market to serve them. Currently, foreigners can own up to 40% of a company based in Tanzania.

Local investors operate at most at the US\$1-2 million range and investors in the \$5 million range are few and far between. The same applies to capital requirements of existing projects. All large investments (above the US\$ 5 million level) in the ICT sector have been restricted to TTCL large infrastructure projects, the mobile operators, and private network investments for internal use by companies such as by the railway or gas pipeline companies..

3. Review of Seven Primary Segments

3.1 Infrastructure

3.1.1 SAT-3/WASC/SAFE project

Signed in June 1999 and initiated by Telkom South Africa and France Telecom, this undersea optic fibre cable system has been operational since 2002. The project consists of two segments, the first one linking South Africa and Europe and the other from South Africa to Malaysia (SAFE: the South Africa Far East optical fibre submarine cable). The SA–Europe link is expected to have landings in about 10 West African and Southern African countries, while the SA–Malaysia link has landings in Reunion, Mauritius and India.

Although Tanzania was not part of this first phase, the opportunity to connect to the system exists. The East African Submarine Cable project whose project coordinator is Zantel is well on its way to beginning a feasibility study to connect Tanzania to SAFE. The pre-feasibility study that was conducted in conjunction with the IFC was positive, and resources for a full feasibility study have been mobilized, again with the support of the IFC. The intended result is having connected to SAFE at Durban, the existing submarine cable will be extended up to Djibouti with sea- and land-based fibre optic cables potentially connecting Tanzania, Uganda, Kenya, Djibouti, Madagascar, Mozambique, Rwanda and Burundi directly to the internet. Estimated costs are between US\$ 250 to 300 million to implement the project.

There is also a project backed by Transnet, Telkom SA, the rail group Africa East Coast and others to lay 2,500 km of optical fibre from Dar es Salaam along the existing railway

line to Livingstone in Zambia. The plan is then to link this with a fibre optic cable laid by Namibian Telecommunications from Windhoek to Livingstone, with connections to other central African countries planned (Kenya, Uganda, Burundi and Rwanda).¹⁰ Windhoek already has a high capacity fibre optic link to South Africa that can then connect to SAT-3.

3.1.2 Fixed Line Access

With the assistance of international donors¹¹, and with a view to preparing TTCL for a competitive environment, over the period 1995 to 1999 TTCL embarked on a US\$ 250 million Telecommunications Restructuring Programme (TRP). This resulted in a network that is over 95% digitalized,¹² although network quality issues still exist in the rural areas.

As of July 2000, TTCL had 165,000 connected lines with an exchange capacity of 234,000. In 2003 this number had declined to 160,000, presumably due in large measure to the rapid growth in mobile. A condition of the partial privatization of TTCL was that at least 810,000 new lines had to be connected by the end of the four-year exclusivity period (February 2005). TTCL is far from its targets here and at least on paper has been subject to severe penalties, in excess of US\$ 40 million.

Currently TTCL is in the process of implementing a prepaid platform on an intelligent network. The solution would require that regional traffic would be channelled through Arusha and then back to Dar-es-Salaam. Therefore at present nearly all prepaid subscribers are in Dar es Salaam because of the difficulty of authenticating the prepaid accounting system. The intelligent network is intended to solve this, thus moving most – if not all – TTCL subscribers to this pre-paid service. The difficulty of using this prepaid service has further contributed to declining fixed line subscribers. In addition the investment in this particular intelligent network is seen by many observers to be non-value-added since it is not intended to improve or to provide value-added services, or even to extend the reach or capacity of the fixed line network country-wide.

3.1.3 Mobile (Cellular) Network

While in 1993 there was only one Mobile operator, by the year 2002, five operators were in place. Today four remain, after the withdrawal of one licence by the Commission, in January 2003. The operators with their estimated customer base in 2003 were:

Vodacom (Tanzania) Limited – 546,000 customers

Mic (Tanzania) Limited (Mobitel) – 160,000 customers

Celtel (Tanzania) Limited – 130,000 customers

Zanzibar Telecom Limited (ZANTEL) – 46,000 customers

Over the last year there has been significant movement. In mid-2004 Vodacom Tanzania estimated 580,000 subscribers and Celtel Tanzania estimated 330,000 active subscribers. However these numbers are continually moving with significant churn and new sub-

¹⁰ www.btimes.co.za/99/1010/news/news05

¹¹ Donor participants include the World Bank, EU, African Development Bank, Sida, Cida, Danida, Japan and Kuwait Fund

¹² Aggressive Internet Access Strategies for Empowering Economic and Service Sectors in Tanzania: The status and future plans for ICT Facilities and Services in Tanzania, Dr Zaipuna Yonah, Simunet

scriptions. Traditionally it has been very hard to get a true picture of the subscriber levels and the average monthly spend since these figures are jealously guarded by the mobile operators.

Precipitated by the issuing of a GSM license to Vodacom, the growth in the number of cellular subscribers has been dramatic in recent years with most subscribers opting for pre-paid services. Mobitel provides coverage in and around Bukoba, Mwanza, Shinyanga, Arusha, Moshi, Dodoma, Morogoro, Mbeya, Dar es Salaam, Pemba, Zanzibar, and Tanga. Vodacom has coverage mainly in Arusha and Dar es Salaam but has extended the network into Sigida, Tabora and the island of Pemba. Over 90% of their customers are prepaid. Vodacom has installed a Synchronous Digital Hierarchy (SDH) backbone network along with the access network that distributes the voice traffic further afield in Tanzania. Celtel is the only mobile operator that is providing cellular services in every region of the country. Its own strategy is to continue to connect rural areas and to have complete country coverage in three years' time. It has consistently been doubling, or more, its subscriber base each year since it commenced operations in 2001.

As competition grew, so did stress in the industry. Some mobile operators are said to have bypassed the Regulator and directly approached politicians with complaints on regulatory issues, confounding efforts by the Regulator to avoid political interference and act professionally and transparently. By contrast, from industry's side, there were growing complaints about the Regulator, with criticisms such as lack of technical know-how, inconsistent application of the regulations, changing rules, uneven application of the rules, and interference by government officials. Perhaps as a result of this, the ongoing disputes with Mobitel, and threats of court action, the Ministry of Communications amended the Telecom Act in 2001 to strengthen enforcement and empower TCC to reallocate frequencies and impose massive fines on anyone misusing particular frequencies.

Finalizing a set of acceptable interconnection rules was also taking a long time, presumably delaying further possible reductions in prices for both voice and data. So, the TCC's "Interconnection Determination" issued in September 2002 was widely acclaimed. It was expected to resolve some of the nagging issues on competition, fair tariffs and interconnection rates and disputes, generally levelling the playing field and hopefully reducing prices. It was hoped that this determination would counteract many of the angry accusations against the Regulator. Early in October, however, the Regulator suddenly announced a delay in enforcing the Interconnection Determination until 10th January 2003 citing "technical reasons". This opaque decision resulted in an outcry.

The dust is perhaps only now settling thanks to the TCRA commissioning of a new interconnection study. It used the internationally accepted cost-based methodology, and all mobile service providers provided their cost structures and other financial data. They were all involved in the study including in workshops to discuss interim results. This new "Interconnection Determination" was to be enforced in a structured manner with interconnection rates dropping over the next four years beginning on 1 August 2004. However while all parties have accepted this determination, Vodacom did not. The TCRA is addressing this in a structured and transparent process with an independent commission chaired by a highly respected retired judge holding both public and private hearings with the support of the TCRA Consumer Consultative Council. This is the first time such an issue has been dealt with in a transparent manner in Tanzania's regulatory history.

3.2 Internet Access

3.2.1 Data Access Providers

The Tanzanian Communication Commission has licensed six companies to utilize Private Data Communication Services and ten to provide Public Data Communication Services and including

- Wilken Afsat
- Datel Tanzania
- Equant Tanzania
- Simbanet Tanzania
- Soft Tech Tanzania
- Fastcom Africa

Of these, Wilken Afsat, Datel and Simbanet appear to be the most active. These companies are permitted to install infrastructure for data communication purposes but not for voice. Wilken Afsat, for example, provides private data networks to individual companies primarily in the Banking Sector. Soft-Tech is noteworthy in that it has the only privately owned satellite hub and network management center in Tanzania. Its focus is on government installations at the central and local government levels and is in the process of introducing innovative e-card switching services.

3.2.2 Internet Service Providers (ISPs)

There are presently twenty-one licensed ISPs in Tanzania. The more prominent are:

- Computer and Telecommunication Systems Ltd (CATS)
- Cyber Twiga
- Simunet, a wholly owned subsidiary of TTCL
- Planetel Communications
- Raha.com

Industry members give estimates of between 15,000-20,000 dial-up accounts in the country, with many more users via Corporate LANS and Internet cafés. Accurate figures are not available, but the proliferation of Internet Cafés in Tanzania indicates that there is great, unsatisfied demand in the country for some form of connectivity.

Individual ISPs debated the merit and operationalization of an Internet Exchange Point (IXP) in Tanzania for a long time. Eventually a subgroup of ISPs indeed set up an IXP. Rather soon they claimed monthly savings of \$10,000 in avoided international costs so it can be expected that most ISPs will now join forces.

The largest ISP, Raha.com started in 1996 and it provides services via satellite using 2.4 GHz microwave links for local/national services. International access is provided via VSAT. When it started eight years ago, a 64 kB link cost US\$10,000. Now in 2004, the cost is US\$300. Raha.com has 600-800 dial-up customers using TTCL phone lines and approximately 400 high usage corporate and government customers via wireless technology (64kB and up). In the SOHO/home user segment, Raha has another 2,000 wireless based customers paying US\$50/month. Raha.com also provides hosting, email management, website design and development and other value-added services.

Raha.com wants to pursue several projects to expand its operations. It is considering setting up an IP telephony service that would allow flat rate calling within the network. Another is a major infrastructure project that would allow the provision of voice and data services via a new wireless network. The cost of the network is claimed to be 10% of the cost of a more "traditional" mobile wireless network. TCRA has given green light to the project. The investment required for the project, depending on the coverage, is US\$25-50 million.

3.2.3 Internet Cafés, Telecenters

Cybercafés and Public Call Offices (PCOs) are the phenomena of real interest in Tanzania. The first cybercafé opened in 1996 and growth took off in 1998. The original intention was to open up access to the internet in a country with minimal and expensive access to domestic telephones and computers. A recent survey suggests that there are now several hundred cybercafés in the country, with perhaps 90% in Dar es Salaam. The survey gathered quantitative data from about sixty cybercafés in several towns. Most have fewer than ten computers and connect to their ISPs via microwave local loop. According to this survey, the typical user of a cybercafé in Tanzania is a young unmarried male with a secondary or tertiary education who is either a student or self-employed. Another survey in rural areas, however, concluded that users were more typically in the 30-40 age bracket.¹³ Usage is typically for email, although there is some web surfing and—despite being illegal—a good deal of telephony using Voice over IP (VoIP). There is also a growing use of cybercafés for online chatting, especially by young professionals and businessmen.

In secondary towns Internet café's are appearing as well. For instance there are several Internet cafés in Mwanza, supported by ISPs such as MwanzaNet, Raha.com, AfricaOnline and CyberTwiga. Two years ago AfricaOnline had about 600 dialup accounts; eight clients with 32-64kb wireless leased lines and 10-15 corporate dialup customers, each sharing 32-64kb connections among their local offices.

The establishment of cybercafés boomed between 2000-2001, but inevitably competition forced down prices to unrealistic levels and now market experts in Tanzania are observing a consolidation of the market. A considerable number of cafés have closed, some have reduced their number of computers (especially where connectivity fees depend on the number of computers connected), and some have moved to smaller premises, due to high office rents.¹⁴ However despite all the commercial pressure on cybercafés many are surviving and thriving. The most successful have internet access as only one of the diversified range and variety of services they provide. These services include VoIP international calls, training, secretarial bureau-type services including production of business cards and invitation cards, etc.

A previous study of Internet cafes questioned the long-term viability of the Internet cafés in Tanzania.¹⁵ Based on an analysis of the business model of their fairly large and diversified Internet café in Dar es Salaam,¹⁶ the owners concluded that a realistic charge for connectivity should then have been at least Tshs 2000 (US\$2) per hour, compared to their rate at the time of Tshs 1000 (US\$1) per hour and the general rate of Tshs 500 (US\$0.50) per hour. They noted that the equivalent charge in neighbouring Kenya is equivalent to Tshs 6000 (US\$6) per hour. However, today, the equivalent charge in Uganda is roughly US\$1 per hour.

It thus appeared that most Internet cafés had not adequately analyzed their cash-flow requirements or accounted properly for aspects such as depreciation of equipment. Market forces had driven internet access charges down to an unsustainable level. ISSAM, for instance, was relying on project fees and other services to make ends meet. It was

¹³ Private Communication: Olaf Nielinger

¹⁴ Private Communication: Olaf Nielinger

¹⁵ See www.sida.se

¹⁶ ISSAM Internet Café, corner Sokoine Drive/Zanaki Street

also believed that in general the illegal provision of VoIP services was a factor sustaining many cafés.

Public Call Offices (PCOs) are an alternative and growing voice communications facility for those lacking mobiles or landlines. Indeed at least one mobile provider has just introduced a technology specifically aimed at PCOs and any shop that wishes to introduce paid calls to mobile telephones.

Other modes of public access such as multipurpose telecenters have not as yet taken on in Tanzania.¹⁷ There are telecenters in Sengerema Kasuku and Magu that went online 2000/2001. A recent study of the activities at these centers, seen as examples of rural connectivity solutions indicate a range of applications, depending on the center, and highlight the challenges facing provision of rural connectivity.¹⁸

3.3 Software and ICT Services

The ICT industry in Tanzania is small, although there is a surprisingly diverse range of goods and services offered. Manufacturers such as Motorola have developed personal computers specifically for Tanzania (e.g. the Motorola Starmax, a Macintosh-compatible machine). Although the industry itself started in the 1960's there was a long period of dormancy due to the policies of the socialist government under Julius Nyerere, the effects of which are still felt today.

There are 52 companies listed in the Tanzania Yellow Pages under 'Computer Hardware, Software and Maintenance Services' and of these 39 (77%) advertise e-mail addresses and ten (19%) have Web pages. Four Companies are listed under 'Computer Consultants', four under 'Computer Training' and 20 under 'Telecommunications Equipment and Services'. There is not much overlap between the different categories, and the great majority of these companies are small; the more prominent international brand names that are conspicuous in Tanzania include Microsoft, Compaq, Hewlett Packard, IBM, Cisco, Epson, Oracle, APC, 3Com, 3M, Nokia, Motorola, and Ericsson. Notably, most of the parent companies are not directly represented in Tanzania but operate through agents. There follows a brief description of a few prominent ICT companies in Tanzania.

Computers and Telecoms Systems (Tanzania) Ltd (CATS)

CATS had its origins in the early 1960's as a wholly owned subsidiary of International Computers Ltd (ICL). CATS has a technical staff complement of over seventy. It adopted the present name and became locally managed and controlled in 1986, and currently has the following Divisions:

Sales

The Sales division markets a range of hardware and software products from personal computers to printers and power protection equipment. CATS is an authorized Compaq reseller and service provider, a sole distributor of Meissner Power protection equipment and A Microsoft Business Center.

¹⁷ Compared with cybercafés, telecenters typically offer a wider range of services such as training facilities, other information resources, professional support services, etc.

¹⁸ Rural ICT Utilization in Tanzania Empirical Findings from Kasulu, Magu, and Sengerema *Olaf Nielinger* October 2003.

Software

The Software Division claims to have 'the largest software team in Tanzania today',¹⁹ employs 15+ staff, and can provide local development of computer application packages, implementation, training and support of Oracle as well as for selected off-the shelf products²⁰.

Engineering

This division performs configuring, testing and installation of equipment, installation of Local Area and Wide area networks, network design, inter alia. A staff of about 15 includes Certified Systems Engineers in Microsoft, Compaq and Novell Products.

Business Machines Tanzania Ltd. (BMTL)

BMTL was a pioneer in office automation and computing in Tanzania when it started selling Olivetti manual typewriters and DEC computer hardware. BMTL has four main lines of business. In telecommunications (4th in revenue), it provides EPBX-switchboard solutions and PABX to enable IP telephony based on technology by Siemens. Its IT department (2nd in revenue) supplies Cisco and Sun based WANs. Office equipment department (3rd in revenue) provides safes, shredders, etc. The largest department by revenue is retrographics/printing. BMTL has a staff of 270 in four branches of which about 150 are technical staff. 60% of the revenue comes from sales to government. BMTL is interested in cooperation with the IFC. It is looking at regional opportunities regarding fibre optics deployment.

Soft-Tech Group of Companies

The Soft-Tech Group²¹ is a major player which operates across the technology field including ICT training, ISP, data transport, and electronic payment systems. Data transport and e-card services including ATMs are a priority. To this end it has implemented its own satellite hub and intends to roll out a minimum of 200 ATMs country-wide providing services to banks, retailers, oil companies etc. This investment has required approximately US\$ 3 million so far and the project is still in the process of being implemented.

It has also developed custom software (ordering and billing system) development for TTCL although it has no ambitions in the software sphere due to high development costs. However its largest client is the government where it is responsible for maintaining the Platinum ERP system it customized heavily initially for the Ministry of Finance – Expenditure. Platinum is possibly the largest software investment by the government. It is now being rolled out to all local authorities in phases, has been implemented in the Tanzania Revenue Authority. Most executive agencies of government are also in the process of implementing Platinum ERP. SoftTech's planned investments in its focus areas total about US\$6-7 million over the next two years.

Institute of Management and Information Technology

Established in 1987 as an ICL training center, the Institute offers a variety of technical and management courses including one year and two year diplomas accredited with the

¹⁹ www.catsgroup.com

²⁰ However, a brief impression of Aptech suggests they are a larger and more diverse computer company.

²¹ www.stcl.com and www.intafrica.com

Institute for the Management of Information Systems in the United Kingdom. There are four training centers with over fifty computers in place. The center, which was visited by the authors, appeared very professional.

Systems Integration

This Division provides internet services using high-speed wireless or leased-line connections and claim connectivity speeds of up to 11Mbps. Using Cisco Aironet 340 Wireless Bridge, CATS-NET offers both in-building and building-to-building connectivity. Over 1500 customers have been connected.

Computer Center (Tanzania) Ltd

Founded in 1988, Computer Center (CC) has a total staff complement of about 40 with offices in Arusha, Moshi, Mwanza and Zanzibar as well as the head office in Dar es Salaam.

CC has two divisions:

- Sales

Products sold include servers, laptops, desktops, printers, and software from suppliers such as Microsoft, Compaq, Epson, IBM, Hewlett Packard and APC. CC is a Microsoft Certified Solution provider and also supports enterprise solutions through Scala East Africa.

- Technical

CC employ twelve qualified professional engineers who are certified by Compaq, Microsoft, Novell and IBM. Maintenance contracts and networked solutions ranging from the configuring and implementing of wide area networks to setting up ISPs are offered.²²

AfriConnect

This new company carries out tailored software development; for example SMS development work for Celtel that provides traffic and flight information. It also has plans for setting up a call center. AfriConnect needs to invest in a network operations center. It is looking to data warehousing for which it needs a data center at a cost of approximately US\$300,000. This is quite ambitious as the revenue target for 2004 is US\$200,000.

Telecommunications Vendors

No telecommunication equipment is produced in Tanzania, but a number of major vendors are represented, supplying:

- Transmission equipment (e.g. Siemens South Africa, who secured a US\$52-million contract in May 2001 to rollout Phase 2 of the Vodacom Tanzania network)
- Mobile switching systems: Siemens, Alcatel and Nokia
- Network equipment and Switches: Newbridge, Bosch, Cisco
- Telephones/PABX : Panasonic, Alcatel, SonyEricsson, Nokia
- Fax Machines: Olivetti, Brother, British Telecom, Nashua, Phillips, Samsung
- Cellular Handsets:Nokia, Motorola, Ericsson, Sanyo
- Public Coin and Card Phones: Schlumberger

²² www.cctz.com

- Cordless Phones: Nokia, Motorola, Bosch

The Tanzanian Investment Corporation (TIC)

The 1997 Tanzania Investment Act established this Government Agency to “be a one-stop center for investors and enable the government to co-ordinate encourage promote and facilitate investment in Tanzania.” It registers large numbers of local, international and joint projects. Registration carries with it benefits like tax holidays. If it is in a “lead sector” the benefits are greatest. ICT is a lead sector. The researchers received the promotional and explanatory material on the TIC and a list of “ICT” projects supported by the TIC. Project ideas that investors have discussed with the TIC included new opportunities in the EPZ, a proposed computer assembly plant and the submarine cable. TIC had started assisting local investors to access financing.²³

3.4 Enabling Technologies and Solutions

There is little development in this technology industry segment. The banks have been automating their processes and applications allowing Internet access to banking information are being rolled out by a number of the more innovative banks such as Citibank and Barclays. At a basic level account information is available over the Internet via trusted transactions.

The lack of legislation to support trusted transactions and electronic payments mean that the only locally issued cards in Tanzania are debit cards backed by VISA. However it is reported that at least one bank is moving to full local credit cards backed by VISA. ATM transactions are common in the major towns, and the fact that at least one ISP is building a generic e-card solution for subscription by banks and retail outlets will show some movement in this segment. However broadly enabling technologies in this segment have been severely hampered by the lack of finance, enabling legislation, and skills to design, develop and manage such technology solutions.

3.5 ICT Enabled Services

To enable the sub-sector to grow, significant improvement in the availability of bandwidth is required, which is difficult, if not impossible, to achieve to a sufficient extent without the construction of the new submarine cable along the East African coast. Satellite communications in some high-capacity activities such as back office processing is not a viable and competitive long-term solution.

3.6 ICT Distribution

This aspect is covered under 3.3.

3.7 E-Government Initiatives and Modernization

The Government has made significant recent investments in upgrading its own satellite hub and network management systems that are operated by the Tanzania People’s Defence Force (TPDF – the army). The TPDF’s systems are currently using less than 5% of the overall capacity of its voice and data bandwidth, with a current capacity of 1000 VSATs that would be locally managed. As a strategic thrust the Government approved an e-Government infrastructure strategy that will provide the enabling infrastructure for

²³ A listing of some 40 projects registered with the TIC over the last five years can be provided.

e-Government applications by expanding and modernising the TPDF systems in partnership with Siemens of Belgium as part of ongoing development cooperation. This infrastructure is envisaged to seamlessly link all central government ministries, all regional centers, and all referral hospitals country-wide. This will allow the e-Government applications that are currently being developed and implemented centrally to reach all parts of government in a structured approach. This is a significant development since it will require a much stronger private sector to support a truly country-wide single client. It is an overt intention of government to boost the sector country-wide by becoming an “intelligent user of ICT”.

In reality the computerization and modernization of the government communications infrastructure is, however, a great challenge. There are a multitude of projects going on in various ministries and departments within ministries, which are not linked or standardized in any way. Many government organizations are setting up web sites and local area networks according to their own specifications. The Public Service Management Department in the Office of the President is responsible for the development of plans for infrastructure deployment and the system management within the government. Currently, there is an urgent need for a wide area network that would capture the various government organizations.

4. Trends and Market Opportunities

4.1 Key Trends

The ICT sector in Tanzania is undergoing rapid change. The monopoly on fixed line telephony is about to go and the only uncertainty is whether there will be duopoly or oligopoly from February next year. The regulatory authority in the country, which has had a long and generally positive record of independence, is likely to continue this way in the more competitive environment. The creation of a Consumer Consultative Council is an unusual and positive step for African countries.

As elsewhere in Africa, mobile wireless has transformed the communications in Tanzania in the past few years. Entrepreneurs are currently positioning themselves to take advantage of the liberalization when it occurs in February 2005. The shift to a technology neutral fully competitive telecommunications environment will undoubtedly lead to innovative solutions in areas such as VoIP. In general, new models are being sought to satisfy the high demand for communications services in rural areas where the users' ability to pay is lower than in cities.

Regional opportunities are also opening up with the increasing economic cooperation between East African countries. The proposed submarine fiber-optic cable on a sub-regional basis will add to these opportunities.

4.2 Investment Recommendations

Several companies visited during the fieldwork on this project expressed real interest in financial support for their future business plans. Often those plans were to take advantage of the future technology neutral regulations and the opportunities presented for new ICT products and services. Investment areas that the IFC could pursue include:

- Funding of landing points and terrestrial connections to the proposed submarine cable, extending to neighbouring landlocked countries.

- Establishing a National Banking Switch.
- Investment support for tertiary institutions and private training establishments to build a larger cadre of ICT maintenance professionals.
- Support for new business ventures gearing up to exploit the open telecommunications environment.
- Investment in an expanded Tanzanian IXP (which could grow to become a sub-regional IXP).
- Establish links with the Tanzanian Investment Center to gain greater insight into the types of business opportunities local and overseas investors have been seeking in Tanzania
- Open discussions with banks, especially the African Banking Corporation, to explore the possibility of establishing an ICT Venture Capital fund in Tanzania

The confidential report lists particular companies and potential projects.

4.3 Developmental Impact of Investments

To satisfy the development mandate of the IFC, one major criterion for evaluating prospective investments is the extent of impact that the investment is likely to have on the country or the community, i.e. people at large. Considering this, the primary needs in Tanzania relate to the condition of the infrastructure and human capacity to produce, i.e. technology skills among population. Most of the identified opportunities rate highly against these parameters, and are therefore, from that perspective, appropriate for receiving IFC consideration.

Investment in the submarine link and its landing points and extensions inland will have major long run implications for increasing access and enhancing affordability of telecomm services to urban and rural populations.

4.4 Potential Partners

The projects identified all involve potential partners. In addition, in the local investment arena, it is recommended to consult the following persons who not only have insights regarding the investment climate and opportunities in Tanzania, but are themselves active and well-connected investors in the technology industry.

- Mr. Ami Mpungwe

Mr. Mpungwe is a former Tanzanian High Commissioner to the Republic of South Africa and a businessman with interests at least in NamITech (30%) and tanzanite mining. He is chairman of TanzaniteOne Tanzania Ltd.

- Mr. Ali Mufuruki

Mr. Mufuruki is a prominent businessman in Tanzania and Chairman of the Infotech Investment Group. He is interested in developing a concept for a local technology venture fund and he is interested in investing in it himself. He has also indicated that he knows other investors who would be interested in participating in such a venture.

Key participants could include the ABC Bank to explore possible Venture Capital opportunities in Tanzania, and the Tanzania Investment Corporation to assess potential ICT projects.

4.5 Policy Recommendations

Tanzania is on the brink of major changes in telecommunications policy and regulation, with February 22 2005 being a critical launch date. The details are keenly awaited by all players.

With regard to the ICT policy adopted in 2003, it is a concern that little has happened to initiate implementation. From conversations with ministry officials it appears that donor support for the implementation process has stalled, leaving the Ministry of Transport and Communications with its extremely limited resources to bear this load of driving the implementation process forward. This is a key area to support progressing ICT as a sector in its own right, and embedding it in all aspects of the economy thus supporting the drive for development. Intervention in the area of implementation planning support and advice on appropriate institutional arrangements are perhaps the highest priorities.²⁴

5. Concluding Comments

This study suggests that, while the Tanzanian ICT market is small, it is growing and there is widespread public and private sector enthusiasm, and opportunities for growth in the sector. The policy and regulatory environment continue to evolve in positive directions, presenting opportunities for existing firms to move to the next level and for the creation of new products and services.

Most investment opportunities in the Tanzanian ICT space will be below the minimum level traditionally targeted by the IFC (the submarine cable project may be the one exception). Therefore, given the business potential in the country, it becomes of special interest for the IFC to dialogue with potential local investment partners to explore participation in a venture capital fund managed by local business people and bankers.

The confidential material to accompany the final version of this report will list several firms that expressed serious interest in follow up discussions with the IFC. A second phase involving one-on-one conversations between IFC officials and Tanzanian business should reap rewards for all participants.

²⁴ In conversation with the national ICT coordinator Eng. August Kowero on support from SIDA for the ICT policy process.