ICT Investment Opportunities in East Africa

Country Specific Market Analysis Kenya

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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

ADSL	Asynchronous Digital Subscriber Line
ASP	Application Service Provider
ATM	Automatic Teller Machine
BPO	Business Process Outsourcing
BSA	Business Software Alliance
CBA	Commercial Bank of Africa
CCK	Communications Commission Kenya
CDC	Commonwealth Development Corporation
CD-ROM	Compact Disk - Read Only Memory
CDS	Central Depository System
CEO	Chief Executive Operator
CFSK	Computers for Schools Kenya
COMESA	Common Market for Eastern & Southern Africa
CSK	Computer Society of Kenya
CSP	Content Service Provider
EAC	East African Community
EPC	Export Promotion Council
EPZ	Export Processing Zone
ERP	Enterprise Resource Planning
ERSWC	Economic Recovery Strategy for Wealth and Employment Creation
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GITS	Government Information Technology Services
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
ICDC	Industrial and Commercial Development Corporation
ICT	Information and Communications Technology
IDRC	International Development Research Center
IFC	International Finance Corporation
IFMIS	Integrated Financial Management Information System
IP	Intellectual Property
IPC	Investment Promotion Center
IPPD	Integrated Payroll System
ISP	Internet Service Provider
IT	Information Technology
ITU	International Telecommunications Union
IXP	Internet Exchange Point
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KANU	Kenya African National Union
KCB	Kenya Commercial Bank
KDN	Kenya Data Networks
KENET	Kenya Education Network
KENGEN	Kenya Power and Lighting Company, the Kenya Power Generating Company
KENIC	Kenya Network Information Center

KEPSA	Kenya Private Sector Alliance
KES	Kenya Shillings (1 USD = 81.12 KES)
KIE	Kenya Institute of Education
KIF	Kenya ICT Federation
KIPI	Kenya Intellectual Property Institute
KPC	Kenya Pipeline Corporation
LAN	Local Area Network
MAN	Metropolitan Area Networks
MCSE	Microsoft Certified Systems Engineer
MSc	Master of Science
NARC	National Rainbow Coalition
NFP	Network Facilities Provider
NIC	National Industrial Credit Bank
NSE	Nairobi Stock Exchange
OSS	Open Source Software
PC	Personal computer
PCK	Postal Corporation of Kenya
R&D	Research and Development
RTO	Telecommunications Operator Licences
SMME	Small, Medium and Micro Enterprises
SMS	Short Message System
SNO	Second Network Operator
TESPOK	Telecommunications Service Providers of Kenya
TKL	Telkom Kenya Ltd
UMTS	Universal Mobile Telecommunications System
USAID	United States Agency for International Development
USD	United States Dollar
USIU-A	United States International University, Africa
UTL	Uganda Telkom Limited
VCR	Video Cassette Recorders
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
VSAT	Very Small Aperture Terminal
WAN	Wide Area Networks
WiFi	Wireless Fidelity

1. Kenya Today

Map of Kenya showing major cities and borders[1]

The Republic of Kenya is situated in Eastern Africa, with an eastern coastline between Somalia and Tanzania. Its major seaport is in Mombasa. Kenya covers an area of 582 650 sq km, of which 13 400 sq km is covered by water, mainly located in the Great Rift Valley on the western side of the country. Its direct neighbours are Tanzania, Somalia, Ethiopia, Uganda and Sudan.

Kenya's population of 32,021,856 million (July 2004 estimate) is largely youthful, with over 40% of its population being under the age of 14 years. The population growth rate is estimated at 1.14%.[2] The incidence of HIV/AIDS is taking its toll on the population and present life expectancy is estimated at 45 years. According to 2001 figures, over 2,5 million people are infected with HIV/AIDS. Literacy rates are high at 85,1% although there is a gender discrepancy between men (90,6%) and women (79,7%)[3]

The Kenyan population consists of various ethnic groups, with the Kikuyu making up the larger proportion (22%), followed by the Luhya (14%), the Luo (13%), Kalenjin (12%), and the Kamba (11%). Other Africans make up 15% of the population and non-Africans only 1% (Asian, European, and Arab).

[1] CIA - The World Factbook 2004 http://www.cia.gov/cia/publications/factbook/geos/ke.html
[2] ibid.
[3] ibid, 2003 estimate

The country's GDP is estimated at about USD 33 billion in 2003, with an estimated GDP per capita of USD 1000. This places Kenya behind two of the East African countries under study (Mauritius: US 11 400; Uganda: USD1 400) and ahead of Tanzania at USD 600).

Poverty data indicates that more than 50% of the population lives below the poverty line. Unemployment figures are estimated at over 40%.

Although only 19,1 % of GDP is contributed by agriculture, it employs about 75% of the labour force (2003 est.). The main agricultural products are tea, coffee, corn, wheat, sugarcane, fruit, vegetables; dairy products, beef, pork, poultry, eggs.

Industry contributes 18,3% with the remainder provided through services. The major industrial activity is based on the production of small-scale consumer goods (plastic, furniture, batteries, textiles, soap, cigarettes, flour), agricultural products processing; oil refining, cement; and tourism. The main export products are tea, horticultural products, coffee, petroleum products, fish, and cement.

Inflation rates have fluctuated over the past five years but have generally been in the single digit range, accompanied by an almost constant USD/KES exchange rate (78-81).[4]

Annual Inflation Rates - Kenya		
1999	112.65	5.8
2000	123.86	10.0
2001	130.99	5.8
2002	133.56	2.0
2003	146.64	9.8

Source: Central Bureau of Statistics, Kenya

Kenya can be regarded as the economic hub in Eastern Africa. Its leadership position has been under threat due to many internal difficulties – high levels of corruption, recurring droughts, crumbling infrastructure, and the 24-year reign of the previous president Arap Moi. All of these led to decreased economic growth, lowered donor support and growing inflation rate. These factors had a direct impact on the ICT sector, which showed little growth in a fairly restrictive policy and regulatory environment.

In December 2002 the ruling party of the time, the Kenya African National Union (KANU) was voted out of power by the National Rainbow Coalition (NARC) under the leadership of the current President Mwai Kibaki. Despite the initial euphoria and some evident changes, the present climate seems to be one of cautious optimism and a concern that change is not occurring rapidly enough. Concerns about the continued corruption within government were mentioned on numerous occasions, particularly relating to a number of large government-initiated ICT projects e.g. the passport issuing system has delivered little, with very large financial payments made.

Kenya is a member of both COMESA and the more recently formed East African Community (EAC), which comprises Kenya, Uganda and Tanzania. A new customs union is planned to come into effect on 1 January 2005 between Kenya, Uganda and Tanzania; Rwanda has also applied for admission. This is an important step in terms of regional economic development.

[4] Conversion rate as at 30 September 2004 were KES81.12)

2. General Market Conditions

2.1 Overall State of Technology

The growth of ICTs in Kenya has been relatively slow over the past five years, except for mobile telephony which shows the same remarkable growth as in the rest of Africa. 2003 figures show that 82.9% of all phone subscriptions are mobile.

Table 1. ICT indicators for Kenya

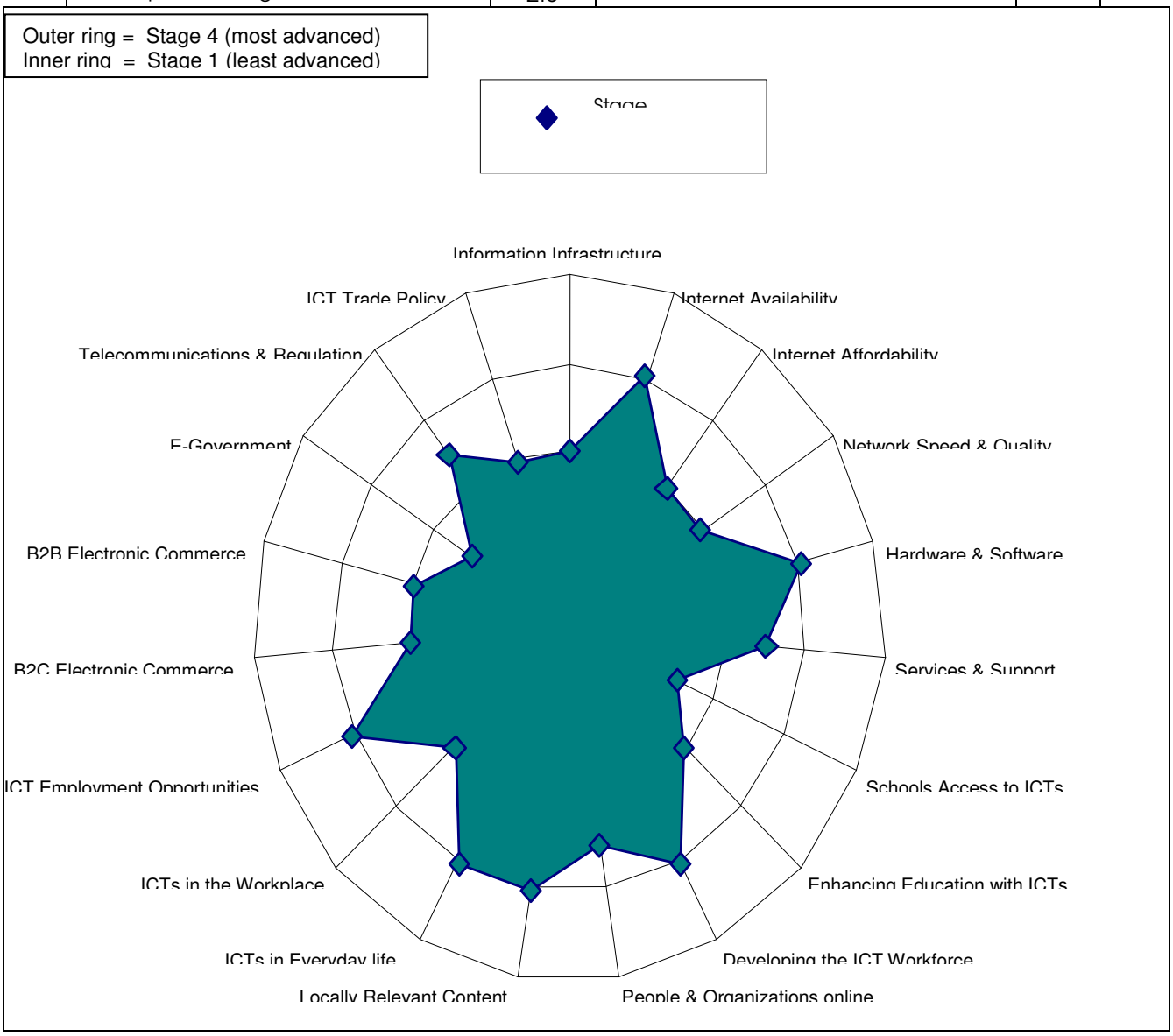
(k) = 1000 CAGR = Compound Annual Growth Rate	(k) 1998	(k) 2003	CAGR (%) 1998- 2003	Main Telephone Lines per 100 inhabitants	
				1998	2003
Fixed Telephone Lines	288.3	328.4	2.6	1.03	1.04
Mobile Subscribers	10.8	1590.8	171.6	-	5.02

Three e-readiness studies were carried out in Kenya during the period 2001- 2002.[5] An assessment study conducted by the government-led IT Sector Working Group and Netcom Information Systems,[6] using the Harvard methodology[7], revealed the following status in 2002:

- The areas showing least progress are in the introduction of ICTs into schools and the establishment of e-government systems. Both have shown progress since 2002, with the expansion of school networking and e-government projects .
- Major deficiencies were noted in the areas of infrastructure availability and Internet affordability. This situation does not seem to have changed much and the fieldwork visit of 2004 revealed much the same problem as shown in this 2002 e-readiness study.
- Internet availability, as judged by the growth in the ISP sector since 2002, seems to have stagnated when assessed in 2004 and it is unlikely that the e-readiness score would be as high if the survey was carried out now. The stagnation can be attributed to the difficult climate in which ISPs have been functioning during the telco monopoly, which provided the only inernational gateway in the country.
- The higher values for ICT employment and development of skills for the ICT sector were borne out in the 2004 field visits, although the relevance and appropriateness of ICT skills development for the industry needs closer scrutiny.

[5] See bridges.org for an overview of the various assessments undertaken.
[6] Netcom information Systems (2002). *Final Report on Kenya ICT Infrastructure and e-Readiness Assessment* (unpublished)
[7] This methodology was developed by the Center for International Development at Harvard University available at http://www.readinessguide.org. It rates development on a scale of 1 – 4 according to various selection criteria.

Indicator	Stage	Indicator	Stage
Network Access			
1. Information Infrastructure	2.0	11. Locally Relevant Content	2.5
2. Internet Availability	2.0	12. ICTs in Everyday Life	2.0
3. Internet Affordability	2.0	13. ICTs in the Workplace	2.5
4. Network Speed and Quality	2.0	**Networked Economy**	
5. Hardware and Software	3	14. ICT Employment Opportunities	2.5
6. Service and Support	2.5	15. B2C Electronic Commerce	2.0
Networked Learning		16. B2B Electronic Commerce	2.0
7. Schools' Access to ICTs	2	17. E-Government	1.5
8. Enhancing Education with ICTs	2	**Network Policy**	
9. Developing ICT Workforce	3	18. Telecommunication Regulation	2.5
Networked Society		19. ICT Trade Policy	2.0
10. People and Organizations Online	2.5		



Business

There is little evidence of a strong R&D and innovation culture in ICTs. Discussions are underway to develop an ICT incubator in Nairobi, situated close to the Jomo Kenyatta International Airport. In September 2004, the World Bank granted funding to the Jomo Kenyatta University of Agriculture and Technology (JKUAT) to establish such an ICT incubator center, which is to include a science park, call center and research and development facilities. The Centre for innovative Development East Africa (c4idea.com) was recently established to support entrepreneurs through creating a resource network of individuals and organizations interested in promoting innovation. It is involved primarily in business, investment and leadership exchange for ICT professionals. C4DEA recently launched a business plan competition, inviting aspiring and established entrepreneurs who wish to start-up a Information and Communication Technology (ICT) business, or expand an existing ICT-driven business venture, to submit their business plans to the competition.

Education.

Kenya has set up a program for providing computers to schools in Kenya – Computers for Schools in Kenya (CFSK), which was established in 2003. CFSK intends to place 20 computers per school into all secondary schools in Kenya. Their 2007 target is to provide 20 000 PCs in schools, 2 300 PCs in community centers, 3 000 ICT trained teachers, 230 community center officials and 2 000 board members trained in ICT awareness. They are presently running a refurbishment center in Mombasa, which receives second-hand computers from the government, donor agencies, and a number of private sector companies such as Unilever, Microsoft, Barclays Bank and Hewlett Packard.[8]

Most public universities are fully networked, as is the University of Nairobi, through initiatives such as KENET. This is not the case with the private universities, except for the larger ones such as the US international University Africa (USIU-Africa). The University of Nairobi presently has about 3 000 PCs, with a 256 kb/s uplink and 1.5 Mb/s downlink. Other Universities have 64 kb/s or 512 kb/s for their entire campuses.[9] Through KENET, the Kenya Education Network, there are ongoing efforts to improve connectivity in universities by providing from 64k to 2mB links.

Government

There are an estimated 4 000 computers (1 / 60 civil servants) within the Government of Kenya. Government information systems are not integrated and there are plans underway to develop an Integrated Financial Management Information System (IFMIS). Local Area Networks (LANs) exist in some ministries, with some interconnectivity between ministries. A recent ICT audit reveals a major ICT skills deficit and a prevalence of outdated ICT equipment and software.[10]

[8] http://www.schoolnetafrica.net/fileadmin/1MillionPCsTraining/Resources/Module%202/Computers%20for%20Schools%20Kenya.doc
[9] Meoli Kathorda, Presentation at the KIF National ICT Convention, March 2004
[10] Peter Gakunu, Cabinet Office, Directorate of e-Government. Presentation to the ICT Convention, March 2004

Health

The national health system is not making use of ICTs in any significant way, beyond a couple of development projects. The private sector has seen opportunities in this arena and several companies are investigating the possibility of introducing integrated health management systems, particularly into the private health sector.

ICT Literacy Awareness

One of the biggest challenges stated by the interviewees in our fieldwork was the lack of awareness of ICTs in general. To address this, a new campaign, Power Up, was recently initiated in Kenya by a group of Kenyan companies. The campaign will be launched in October with an ICT education roadshow in Mombasa, Nyeri, Nakuru, Kisumu and ending in Nairobi.[11] Companies sponsoring the roadshow include Microsoft, Wananchi Online, Intel, Posta, KENIC, Archway Technology Management, Strathmore University, Kenya Data Networks (KDN), etc.

2.2 Policy and Regulatory Frameworks

The present policy and regulatory environment can best be described as:

- A restrictive policy and regulatory environment, with a weak independent regulator;
- Characterised by lengthy and non-transparent policy processes e.g. in the ICT policy and e-government strategy processes, not all relevant stakeholders have been consulted;
- In flux - after several years of a relatively restrictive environment, the appointment of the new Minister of Information and Communications, the end of the exclusivity period for Telkom Kenya Limited (TKL) and the testing of several court cases that impact on the validity of decisions taken by the regulator, the Communications Commission of Kenya (CCK), mean that a number of changes are likely to create a more conducive environment for the ICT industry in future.[12]
- In addition, many see the lack of leadership as a major impediment in the development of a cohesive approach to ICTs. To date, there has been no strong direction in terms of national projects and processes, resulting in a piecemeal and fragmented approach to ICTs.

2.2.1 Telecommunications Policy and Regulatory Environment

The Communications Commission of Kenya (CCK) [13] is the national telecommunications regulator. It presently employs about 120 staff, of which 90 are technical. CCK's market segmentation presently has 46 different licence types that are divided into 9 licence/market groups. Prior to July 2004, the telecomms regulatory environment was seen as one of the major inhibiting factors in developing the ICT sector. The establishment of the new Ministry of Information and Communications in July 2004 has

[11] http://www.powerup.co.ke/
[12] During the fieldwork period in July 2004, the general sentiment from industry players was that Kenya was experiencing a restrictive policy and regulatory environment not conducive to growth of the industry. Subsequent interactions with key ICT experts in Kenya show that numerous changes have taken place and that the environment is perceived as more positive than that experienced during our fieldwork.
[13] www.cck.go.ke

generally been seen as positive by the ICT industry with the new Minister regarded as very knowledgeable about the industry and likely to bring new vision to the ICT sector.

Since July 2004, the telecomms regulatory environment has seen long-awaited changes in liberalization of the sector. Previously, the telecomms environment was described as uncompetitive, with a monopoly telco operator operating the only international gateway Jambonet, very high telecommunications costs, and a regulatory environment unconducive to stimulating the ISP industry. In August 2004, however, a landmark court case set a ruling by the Communications Appeal Authority that is likely to change the management of state-owned enterprises and regulatory bodies. The ruling effectively means that the CCK will have to issue licences to other ISPs, in this case Fastlane, a consortium of seven ISPs. This is likely to reduce the cost of Internet services in the future.

In early September, the CCK announced a revised telecommunications strategy[14] that included abandoning licence auctions for the telecomms sector. This is to be replaced by a fixed price strategy for selling the various services. This is to take immediate effect. Potential licensees will have to demonstrate their capabilities in managing the licenses. The September strategy will open up competition in VSAT, broadcast signal distribution and the international gateway, which until the end of June was run as a monopoly through Jambonet. Additional internet gateway and backbone operators will be able to apply for licenses on a first-come, first-served basis. All mobile operators will be allowed to construct and operate international gateways. All these additional operators will be able to carry VOIP and other forms of multimedia.

Following the recent ending of the five-year exclusivity period for the monopoly operator, TKL, the CCK anticipates complete liberalization of the sector by 2009. In addition, the regulator intends to move, within the next two to five years, towards a technology neutral market restructuring which will make provision for three categories of service providers in Network Facilities (NFPs), Application Services (ASPs) and Content Services (CSPs).

In the meantime, irregularities appear to have arisen in the appointment of the second network operator (SNO), with two of the three final bidders being disqualified on technical grounds and the likely winner, the Norwegian telco Telenor, being excluded on the grounds of a non-competitive financial bidding process due to being the only bidder.[15] The process has experienced delays (the date of appointment was to be 14 July 2004) and the SNO is still not appointed at the time of writing.

2.2.2 National ICT Policy

The final national ICT policy document has yet to be released. A National ICT Convention was held in March 2004 to discuss, *inter alia*, the ICT policy with stakeholders from the private sector, civil society and government. There was general confusion and outcry in that the ICT policy had undergone several revisions since February 2003, that being the last time that the private and civil society had been involved in the process. Most of those interviewed were unclear as to where the ICT policy process was, but the general consensus is that a) it had been drafted with some input from the private sector and civil society, but that later versions had been drafted without further consultation, b) the process has been long and non-transparent, c) there

[14] http://www.eastandard.net/business/bsnews09090408.htm
[15] Balancing Act no 218 August 2004 http://balancingact-africa.com/news/back/balancing-act_218.html

has been little coordination or leadership from government, d) the policy tends to emphasise regulation rather than facilitation, and e) the policy is fragmented and unlikely to provide a common vision for the country. The lack of emphasis on strategy and implementation was seen as problematic in light of Kenya's desire to transform itself into a Newly Industrialized country by 2020.[16]

The draft ICT policy framework prioritises the following areas: economic impact, liberalization of key sectors, e-commerce, e-government and human resource development. There is a strong emphasis on economic growth, although interpretation suggests that it favours foreign investors at the expense of local investors.

Since the appointment of the new Minister of Communications in July 2004, there seems to be uncertainty as to the direction in which developments in national ICT policy will move. There are suggestions that the new Minister will institute a new ICT policy process as he has publicly announced that he is dissatisfied with the 'cut-and-paste' nature of the existing draft ICT policy.

2.2.3 Universal Access Strategy

The CCK, with assistance from the International Development Research Center (IDRC), has commissioned a study on the status of universal access, which is likely to culminate in the formulation of a new policy for the ICT sector.[17] Following a workshop held in August 2004, the intention is that a household survey will be undertaken, which will assess the needs for telecommunications services in rural and underserved areas.[18]

2.2.4 e-Government Strategy

An official e-government strategy document was published in March 2004 under the auspices of the Cabinet Office in the Office of the President. The e-government strategy was kick-started to encourage the development of an ICT policy. One of the major issues is the lack of e-commerce legislation to legitimize e-transactions. Present regulations are not clear and this is limiting the potential of developing e-commerce.

The very ambitious e-government strategy outlines three key areas in which implementation projects are planned: improved communications within government, with business and with the citizen. Details of the planned projects are presented below as these are likely, in the short to medium-term, to provide procurement opportunities for the private sector.

1) Improved communications within government
   a. Short–term objectives (June 2004)
      i. Institute ICT policy and e-Government strategy
         - Finalise e-Government strategy
         - Operationalize implementation of the e-Government strategy
      ii. Expand the information infrastructure (LANs, shared databases, security, IP standards, common access centers)
      iii. Integration of internal Government processes
         - Review process, procedure and regulation
         - Shared information infrastructure

[16] http://ww.africafocus.org/docs04/chak0405.php
[17] Dr. Timothy M. Waema (July 2004). . Final inception report for the Universal Access to Communication Services: Development of a Strategic Plan and Implementation Guidelines. (Unpublished)
[18] CCK, 2 August 2004 http://www.cck.go.ke/headline/headlinemain2004.htm#econet

- Integration and harmonization of common processes such as finance, accounting, procurement
- Integrate operating systems
- Equipment provision for government agencies.

iv. Increase internal operational efficiency and effectiveness
- Implementation of the IFMIS and IPPD
- Enforce standards and control systems
- Initiate other systems to increase efficiency, transparency and accountability
- Producing a leaner, more efficient, effective and productive civil service

v. Developing Websites for ministries
- Centrally hosted Websites
- Connectivity for all government agencies
- Messaging and collaboration services, calendar of events
- E-filing

vi. Capacity building
- Create and sustain leadership for e-government implementation
- ICT literacy training fro all civil servants
- Awareness raising at all levels of government on e—government
- All civil servants with e-mail addresses[19]

b. Medium-term objectives (June 2007)
i. Automation and integration of government information and records
ii. Finalization of infrastructure rollout within government, including district offices
iii. Develop and implement Web-enabled databases
iv. Development of various management systems e.g. Court Registry, Integrated management system for government, physical assets management, education information system, health information system, prisoner organization and experience management system, etc.

2) Communications with business
a. Short-term objectives (June 2004)
i. Development of a single Government portal
ii. Government auctions and e-tendering
b. Medium-term (by 2007)
i. Electronic registration of businesses e.g. company registration, license and permit applications
ii. E-government returns and claims e.g. income tax, compliance
iii. Portal services and data warehousing
iv. E-procurement
v. E-forums
c. Long-term
i. E-government payments
ii. E-trading
iii. Government service management e.g. appointment for licenses, motor inspection etc.

3) Communications with the citizen
a. Short-term objectives (June 2004)
i. Talking to citizens – details of government services through Websites
ii. Improving public services e.g. passports, tax returns, etc
iii. E-policing e.g. security alerts, traffic alerts
iv. Employment e.g. jobs, laws
v. Education e.g. schools admissions, curricula online etc
vi. Family
vii. Elections
b. Medium-term (by 2007)
i. Listening to citizens – democratisation
ii. Property search – buying/selling property

[19] Minister Tuju was quoted as saying that this would be done in the next month (September, 2004)

iii. Law – advice, wills and estates, court-related information

c. Long-term
   i. E-policing
   ii. Elections
   iii. Utilities – payment of bills

The e-government strategy also outlines strategies for training and the development of standards and benchmarks.

In September 2004, the Government of Kenya and the State of New Brunswick (Canada) signed a framework of intent to co-operate in the area of automation and integration of Government information and records.[20]

2.2.5 Economic Recovery Strategy for Wealth and Employment Creation (ERSWC)

The Government of Kenya's Economic Recovery Strategy for Wealth and Employment Creation (ERSWC) of 2003 includes an investment thrust on ICTs. Four areas have been identified:

1. The East Coast submarine cable;
2. National ICT awareness campaigns;
3. ICT skills enhancement; and
4. Central and district e-government initiatives.

The strategy forecasts a 5% growth rate for the ICT sector till 2007, which appears unrealistic in light of generally perceived low growth rates for the industry [21] - official data is not available for the sector. The investment program is estimating that it will require KES 1.2 billion (USD 148 million) to achieve the above objectives, of which the government can provide KES 700 million (USD 8.6 million) The total investment for the ICT component comprises a mere 0.27% of the total estimated investment costs.

2.3 ICT Demand: Public and Private Sectors

2.3.1 Public Sector - Major Users

The public sector is not as yet a major user of ICTs although the recently approved e-government strategy aims to change this. With a very low and often outdated base of computer equipment, the lack of connectivity between government ministries, and few LANs or WANs in place, the government has many challenges in implementing the proposed strategy. Some ministries have initiated ICT initiatives:

- The Department of Health has introduced health management systems into their hospitals. Databases on HIV/AIDS information have been established.
- Historically the Ministry of Finance has been the major driver and user of ICT services within government.
- The Central Bank has been a major user with its history of Mainframe systems.

[20] East African Standard, 23 September 2004
http://www.eastandard.net/daily/hm_news/news.php?articleid=1149
[21] Peter Kabaara, Institute of Economic Affairs, Kenya

- A number of government ministries rely on the systems, services and resources of these two organs of government. The Government Information Technology Services (GITS) Director sits within this ministry.

2.3.2 Parastatals

Several parastatals have recently installed Wide Area Networks (WANs) using VSAT and wireless infrastructure. These include the Kenya Power and Lighting Company, the Kenya Power Generating Company (KENGEN), the Kenya Ports Authority and the Postal Corporation of Kenya (PCK). Kenya Power and KENGEN have also invested in large SAP installations. PCK has been providing intranet / internet access to a large number of Kenyans through its urban and rural postal network.

Investment Promotion Centre (IPC)

The Investment Promotion Centre (IPC)[22] is responsible for promoting investment activity in Kenya. It also sees itself as ICT champion on behalf of investors and recognizes that the government does not understand the ICT landscape well.

It does list Electronics as a potential investment area, but no mention is made of software or services. Areas listed on its Website include the assembly of consumer electronics such as colour television sets, Video Cassette Recorders (VCRs), printers, floppy disk drives, and CD-ROMs; telecommunication equipment such as printed circuit boards, and transmission equipment; and support industry items such as cables, cords, die casting, metal plating, etc.

Kenya Pipeline Corporation (KPC)

The KPC is the parastatal responsible for the transport, storage and delivery of petroleum products either through the pipeline or other means. The KPC is considering the possibility of laying fiber-optic cables alongside the pipeline running from Mombasa to Nairobi. Its interest in ICTs is predominantly to improve its own need for telecommunications and increased automated surveillance, but there are discussions to expand the fibre-optic backbone into surrounding underserved areas. It is the only pipeline in East and Central Africa.[23] The cost of the project is estimated to be USD 12 million. KPC has been granted a provisional license by the CCK to operate a fiber-optic telecommunications system and discussions are already underway with TKL, Uganda Telkom Limited (UTL) and MTN to extend the backbone into Uganda. The Rwandan Government has also shown interest.

Forty-nine companies responded to their initial request for tenders on the proposed telecommunications system. However, a court case is underway to prevent the KPC from going ahead with this process. Datalogix, one of the largest ICT companies in Kenya, was to have undertaken the telecommunications installations but the problems with the awarding of the contract may result in the re-opening of the tender bidding process.[24]

[22] http://www.ipckenya.org/docs/keysectmain.htm
[23] Dr Shem Ochuodho - Presentation on KPC at the ICT Convention, March 2004
[24] Daily Nation, 9 September 2004 - http://www.csk-online.org/html/courthaltspipeline.htm

Kenya Education Network (KENET)

KENET was set up in 1999 as a high-speed educational and research network linking all tertiary institutions in Kenya. This includes universities, post-secondary training institutions and research organizations. Thus far, approximately USD1.2 million has been invested in KENET by USAID. This has allowed KENET to charge its subscribers only 50% of the commercial TKL tariff. KENET is looking for alternative investors as its investment with USAID expires in about six months.

2.3.3 The Private Sector – Major Users

Most of the computers in the country tend to run as stand-alones, or in the case of larger companies, as Local Area Networks (LANs) or WANs (Wide Area Networks). ICTs are generally applied for use in business processes e.g. word processing, accounts, payroll, databases. The market for integrated systems is small and limited to large companies.

Corporate users prefer the branded computers because of a perception of reliability, where the home user and small office users use so-called clones because of their lower purchase cost (about USD500 compared to USD1000 for a branded computer). Apple Macintosh computers are not widely used.[25]

The majority of computers run Microsoft OS as well as Microsoft application programs. Software piracy is widespread, running at about 80% of all usage. The local software industry is negligible.

The Nairobi Stock Exchange (NSE)

The NSE is the largest stock exchange in East Africa with a market capitalization of approximately USD3.5 billion. The central depository system (CDS), planned since the mid-90s, is being launched in October 2004. The electronic system will reduce the transfer of ownership of shares from eight to five days. A disaster recovery site for the CDS Corporation is in place. The CDS Corporation will be managed by a board.[26] The NSE experienced a 7% share turnover in 2003, its best year to date.

Forty-eight companies are listed on the NSE[27], with the largest being Standard Chartered, Barclays, E.A. Breweries and Kenya Airways. No ICT firms are listed. Safaricom has a Ksh4bn bond listed on fixed incomes - no shares are traded. The parent company of AfricaOnline, the African Lakes Corporation, was the first technology listing on the NSE in mid-2000. It delisted in early 2003, the official reason given being that the primary listing on the London Stock Exchange was being delisted.

The only listed venture capital fund is Actis (previously Commonwealth Development Corporation (CDC)).

The NSE established a High Tech Growth Committee *"in areas from where it thought economic growth could come, and where the capital markets could play a stimulatory role*".[28] It has also provided inputs into various government-led ICT policy initiatives. This has been transformed into the ICT Board, which is now recognised as the official private sector association for the ICT sector.

[25] http://www.csk-online.org/html/ict_report.php
[26] Daily Nation, 4 August 2004 http://www.csk-online.org/html/nse.htm
[27] www.nse.co.ke
[28] Mike Eldon (April 2004) KEPSA and its history. Unpublished report

Banks and Financial Institutions

There are about 44 banks in Kenya of which the largest three are the Kenya Commercial Bank (KCB), Barclays Bank of Kenya and Standard Chartered Bank. A number of smaller and usually more innovate banks include Stanbic, Commercial Bank of Africa (CBA) and the National Industrial Credit Bank (NIC). KCB has 113 branches with 60 ATMs which they had planned to expand to 75 by the end of July 2004. They also have operations in Tanzania. NIC Bank, a specialized services bank has recently expanded into the retail market - it has four branches, all providing full internet banking services. It has twelve installed ATMs and is planning for a network of 20 ATMs by the end of 2004.

Paynet provides the switch for the ATMs and connectivity is by Kenya Data Networks. NIC started SMS banking in July 2004. Paynet provides shared ATM switches and backbone services to a number of banks. It has also implemented internet banking services to a number of these clients. Those not within this shared group have implemented their own ATM infrastructure.

Petroleum and Agricultural Processing Sector

The petroleum and agricultural sectors are the other major users of ICT. A large number of the organizations in these sectors run Enterprise Resource Planning (ERP) systems on Wide Area Networks (WANs) across the region covering Sudan, Ethiopia, Mauritius, Tanzania, Uganda, Zambia and Rwanda, with hub operations in Nairobi. Kenya Shell/BP Kenya has a JD Edwards ERP system running across five countries; Caltex with a similar SAP-ERP solution; Mobil runs systems in four countries and is intending to expand to another two.

Bidco[29], one of the largest manufacturers of vegetable oils, fats, margarine, soaps and protein concentrates in East and Central Africa, has installed an ERP system extended across a GSM-based network. They estimate that their ordering system has reduced their turn-around time from forty-eight to two hours.

Wholesale/Retail

Historically, the wholesale/retail sector has been a low adopter of ICTs to improve its business efficiencies in Kenya. Uchumi and NAKUMAT the two largest supermarkets chains, are presently implementing ERP systems countrywide.

2.4 Industry Capabilities

The ICT sector is one of the fastest growing sectors in the Kenyan economy. The ICT industry is generally well-educated, although perceptions are that the level of engineering and technical training is not sufficient to meet industry demand. According to several sources in the industry, there is a general lack of project management and general management skills in the ICT sector, which has resulted in low levels of delivery on ICT projects.

To our knowledge, there is no available data on the ICT skills base in the country. Some available figures are quoted below:

- Microsoft estimates that there are presently 11 000 MS certified people in East Africa. Most of these cannot find jobs. The suggestion was made that a software

[29] http://www.bidco-oil.com/.

development facility should be created as part of the Export Processing Zone (EPZ) as this would create jobs for this underutilised skills base.

- Estimated figures from the Computer Society of Kenya are that there is a total of 5 500 ICT professionals in the country, with 300–500 graduates in computer science, electronics/electrical engineering and library scientists per year.[30]

The ICT industry is generally focused on national, and in some cases, regional activities. There does not appear to be any significant export beyond anecdotal reporting of small consulting and ICT applications to neighbouring countries.

The industry has a number of ICT associations, which at present are not linked through an umbrella organisation that can represent a united voice to government. The existing industry associations are not officially recognised as appropriate vehicles through which the government can interact with the private sector. The recently formed ICT Board is generally seen as the most representative voice of industry. Some of the major industry associations are:

- **Kenya ICT Federation (KIF) / KEPSA ICT Board.** The Kenya ICT Federation is now the official KEPSA ICT Board. The Kenya Private Sector Alliance (KEPSA) created the ICT board (alongside various other sector boards) about three years ago - this represents the interests of a large number of ICT-related industry associations. The KEPSA ICT Board sees itself playing a role in ensuring private sector inputs into ICT policy and strategy processes. Some of the planned objectives include the promotion of liberalization in the telecomms sector, introduction of an e-commerce law, smart ICT incentives, and zero rating on ICT equipment. It also continues to lead and participate in various ICT policy and strategy workshops and awareness raising initiatives. [31]
- **Telecommunications Service Providers of Kenya (TESPOK).** Tespok was established in 1999 by six ISPs. The Internet Exchange Point (IXP) for national peering was set up through this association, as was KENIC, the Kenya Network Information Center. KENIC is responsible for maintaining the national domain registry. Two full-time employees manage it, with surplus funds being ploughed back into development projects.
- **Business Software Alliance (BSA).** This alliance consists of a number of software distributors, and is managed from the Kenya Intellectual Property Institute (KIPI). KIPI deals with general patents and there is little understanding of software issues. The BSA is undertaking to educate top-level decision-makers on software related issues, including the need for changing IP laws, understanding and differentiating products to enable better procurement decisions to be made.
- **Computer Society of Kenya (CSK).** The CSK represents an estimated 6 000+ ICT professionals and corporates in Kenya.[32] As with some of the other associations, it plays a role in awareness raising, lobbying and advocacy on specific ICT issues. It also runs admission exams for setting membership admission grades.

[30] http://www.csk-online.org/html/ict_report.php
[31] The KEPSA ICT Board Strategic Plan: 2003/4 http://www.kif.or.ke/ICTboard_strategic_plan_2003-4.doc; The Kenya ICT Federation http://www.kif.or.ke/about%20us.htm
[32] http://www.csk-online.org/html

Other industry associations include: the Telecommunications Equipment Vendors Association, Telkom Dealers Association / Safaricom Dealers Association, Cybercafe Owners Association of Kenya, and the IT Export Services Association.

2.5 Obstacles to Growth

- ***General economic climate***

  This is not favourable with low GDP, volatile inflation rates and a slow growth rate, although this has improved in the last year. There is a strong awareness of the regional ICT context, with neighbouring countries Uganda and Tanzania exhibiting more liberalized telecommunications environments and governments more favourable towards private sector growth. These are seen as potential threats for the Kenyan ICT sector growth as potential foreign investors may view neighbouring countries as better investment options.

- ***Poor infrastructure***

  The quality of fixed-line infrastructure is poor and the proportion of non-operational lines is significant. Congestion of the international gateway is a problem for many companies, and for international firms, which rely largely on online applications for their operations. System downtime is a serious problem.

- ***The lack of protection of intellectual property rights***.

  Since there is no legislation protecting copyright, there is little incentive to develop software applications as there is no mechanism to prosecute those involved in software piracy. For example, Microsoft was quoted as saying that about 80% of all software was pirated, but that no prosecution was possible unless it could be proved that the guilty party was making money out of it. This in effect makes prosecution almost impossible.

- ***Corruption in the awarding of government ICT tenders***

  Recent media exposure of corruption in the awarding of ICT tenders has resulted in negative sentiment towards large ICT project due to their high cost, and the non-delivery on such projects. Unclear and non-transparent procurement procedures hinder effective participation by a broader range of ICT players.

- ***Low success rate in the implementation of ICT projects***

  The success rate of government ICT projects is low. Institutional memory is poor and new projects need to be started from scratch due to lack of recorded experiences from prior projects.

- ***Low levels of awareness of the applications and benefits of ICTs***

  The generally low levels of understanding of ICTs in government were raised as cause for concern. One of the major interventions identified by those interviewed and who participated in the inception workshop, was the need to establish broad-ranging awareness initiatives targeted at specific Ministries and the broader public. Specific recommended interventions include the development of an ongoing exhibition facility where new technologies could be showcased for government and the industry, IT seminars, and the promotion of ICTs to the public through cybercafés, and popular TV programs.

- ***Poor to non-existent availability of financing for ICT projects***

  Lack of available capital and financing was regarded as one of the largest barriers in the development of the ICT sector, and particularly in software development.

- ***High and unpredictable tariffs on ICT equipment***

  Tariffs range from 5% to 30%, with uncertainty as to what tariffs will be charged, due to lack of ICT knowledge among Kenyan customs officials. Software tariffs are unpredictable and can range from a zero-rating to tariffs being charged. This makes it a difficult climate for software distributors.

- ***Lack of an enabling environment for entrepreneurs***

  The general climate for promoting ICT entrepreneurs is not positive. There is little or no investment capital available and where it is available it draws very high interest rates. The registration of new companies can take as long as six months.

- ***Corporate governance is an issue*** with many start-ups, and even with more mature companies. The management and reporting structures are not sufficiently developed to encourage outside investment.

2.6 Internet Penetration Levels and Affordability

The high costs of telecommunications, as well as the lack of penetration of connectivity into the rural areas has been a major stumbling block in improving access to basic telephony and the internet. The recently initiated universal access initiative by CCK should provide a framework to address these issues.

Though basic telephony is readily available in medium to large urban centers, these services tend to be expensive and somewhat unreliable. Premium services such as ISDN, KENSTREAM and ADSL are largely restricted to the largest urban centers. The only options in the smaller and remote locations are the expensive wireless public and private voice and data services such as VSAT, GSM and recently launched GPRS service.

Current estimates for the internet user base are about 500 000 (2004) but these are not very reliable as the internet tends to be accessed by many Kenyans through shared access centers such as cybercafés. Estimates are that 100 – 120k are found in the Greater Nairobi area. The most recently available official ITU figures are given in the Table below.

Table 2. Internet Penetration and Affordability[33]

Internet Penetration					Estimated PC's	
Hosts Total 2003	Hosts/10 000 inhabitants 2003	Users (k) 1995	Users (k) 2002	Users/10 000 inhabitants 2002	Total (k) 2002	Per 100 inhabitants 2002
8 325	2.63	0.2	400.0	126.98	204	0.65

Internet costs vary widely. However these have dropped over the last few years to approximately USD10 a month for unlimited 56K dialup access and USD250 per month

[33] Extracted from Tables at www.itu.int/ITU-D/ict/statistics/ (2003);
http://www.worldbank.org/data/countrydata/ict/ken_ict.pdf

for the lowest cost dedicated access line (ADSL) with 256K downstream circuit. Wananchi Online charges a flat annual membership fee of Ksh 10 730 for dial-up internet access.[34]

Internet Cafés and Telecenters

Internet Cafés are available predominantly in urban areas - at present no data are available on their numbers or distribution. Average costs vary between KES1 and 3 per minute (USD 0.01 – 0.03). The Communications Commission of Kenya (CCK) is however planning to undertake a survey of rural communications as part of its current review of universal access in the country.

The Postal Corporation of Kenya (PCK) is providing Internet access, through its Post Surf initiative, to about 460 post offices countrywide. Using VSAT, it is providing e-mail access throughout the country. The intention is to link about 650 of the total 990 post offices within the next year. The remainder are those that do not have electricity or are presently in rented office facilities. The cost is KES1 per minute (US 0.01). This initiative has been somewhat successful where it has been understood and used. However, as PCK is currently in the process of converting itself from a government entity to a profit-driven organization, its marketing and promotion strategy requires further effort. The initiative is driven through the Ministries of Transport, Communications and Finance.

2.7 Human Resources / ICT Education

A good ICT skills base exists in the private sector, but skills levels in government are low and exacerbated by the lower salaries paid to civil servants. This has resulted in an exodus of ICT staff to the private sector.

ICT curricula in universities are regarded as too theoretical and not synchronized with the needs of a fast-changing ICT sector. Increased ICT literacy levels are required in the general public to grow the demand for ICT products and services, and monitoring of government ICT projects. There is little understanding of consumer rights with respect to ICT service delivery.

2.7.1 The Education Pipeline: Primary and Secondary Schools

Kenya does not have a comprehensive computer education policy. There is no standardization of curricula for the teaching of ICT literacy in primary schools. Computer education was introduced in 1998 as an optional subject at the secondary school level.

Table 3. Estimates of Computer and Related Qualifications in Kenya (2001)

Level of Qualification	Estimated Figures (2001)
Post-graduate	350
Graduate	800
Pre-diploma/Diploma & Higher Diploma	2 500
Skills Literacy	1 100 000
Schools (4th form)	5 000

Source: Computer Society of Kenya, 2003

[34] http://www.wananchi.com/index.php?type=prod&prod=dial#dial (September 2004)

2.7.2 The Education Pipeline: Colleges and Universities

Kenya has 17 private universities and 6 public universities. All the public universities offer undergraduate degrees in information systems, information technology and/or computer science. Only some of the private universities do so. Only two of the public universities offer postgraduate studies, including a PhD programs. Between 22 and 45 students graduate per year at undergraduate level from each of the universities. The Post Graduate Diploma/ Certificate and Master of Science (MSc) classes normally have between 30 and 40 students per year.

A large number of private computer colleges and training institutions have emerged that offer training in MCSE and general computer skills. No data is available on the actual number of such institutions or the numbers of graduates produced. A recent survey by the Computer Society of Kenya[35] (2003) estimates that in 2001 over 150 000 students had already undertaken basic computer skills training in private training institutions.[36]

2.8 Competition

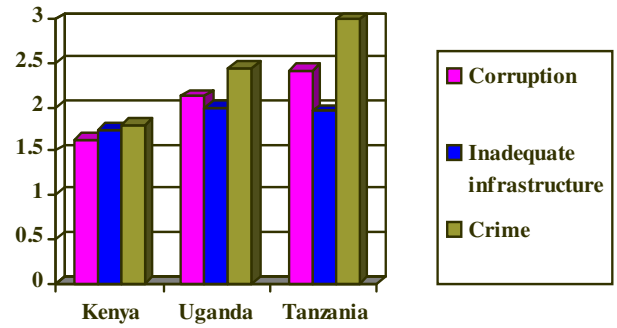
Although Kenya is still regarded as the economic hub of Africa, various interviewees mentioned that the more econmomically-friendly environments in Uganda and Tanzania (and even Rwanda) should be watched as these countries might have the potential to develop into competitive neighbours in the ICT arena. Kenya however has the competitive advantage in several areas:

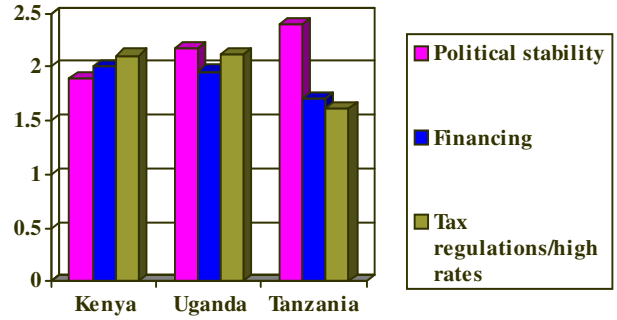
- The quality and size of its labour pool with appropriate ICT skills;
- A more stable political environment - the end of the Arap Moi regime has led to an emerging positive image of Kenya worldwide, with restoration of relations with development partners, increased confidence of the population and general optimism about the future;
- The Government of Kenya has undertaken major reviews of govenment policies in many sectors and is dealing with the excesses of the past and zero tolerance for corruption;
- Kenya has a more robust financial services sector;
- Kenya is widening the democratic space and has recently been included in the NEPAD group of four peer review;
- There is increased interest in Kenya as a trade, investment and tourism destination.

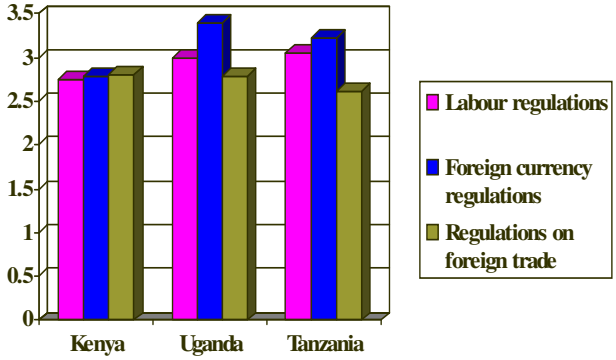
The country does however need a major reorientation of the entire public service, through business process re-engineering and e-governance; the passing of new legislation e.g. the Investment Codes and Privatisation Bill; reducing the cost of doing business, privatization of state enterprises; and fighting against corruption. Comparative competitiveness figures show the following: [37]

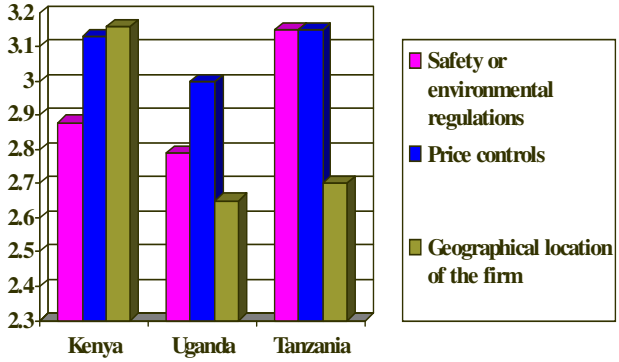
[35] The Computer Society of Kenya. Quarterly report of the Kenyan ICT Sector – 2nd quarter 2003. http://www.csk-online.org/html/ict_report.php
[36] ibid
[37] Julius Kipngetich, Managing Director, Investment Promotion Center (March 2004) National ICT Convention presentation, Kenya's Competitiveness in Business.

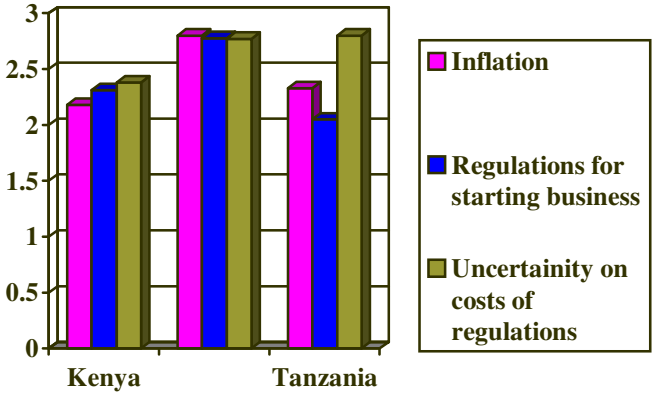
Table 4: Kenya's Competitiveness in relation to Uganda and Tanzania

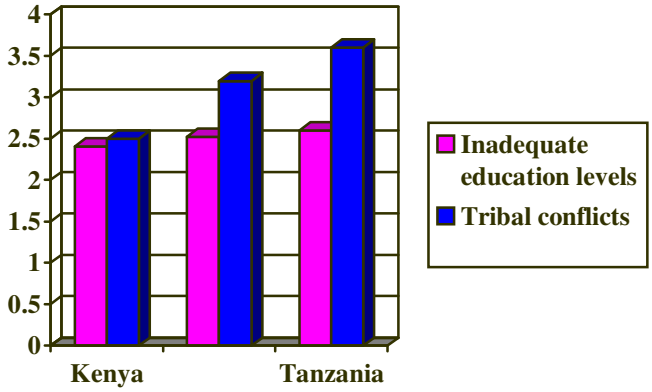












1 = denotes negative perception and 4 = denotes no impact on deciding investment destination
Source: Dr Julius Kipngetich, Investment Promotion Centre, National ICT Convention March 2004

2.9 Capital and Financing

Technology firms are unable to obtain loans from commercial banks. The major banks are seen as having little understanding in terms of funding investments in the ICT sector and are generally not prepared to invest in what they consider a high-risk investment area. NIC Bank, which is locally owned, is an exception to the rule. NIC Bank is the most active, and almost the only, lending institution in the technology field. They have provided loans against receivables as collateral, for example, to mobile phone/airtime resellers. One software company, Virtual City, which develops B-to-B software, has received funding due to their existing contract with South African Breweries. NIC has also provided loan(s) to one established ISP, Access Kenya, for expansion. NIC has not taken any equity stakes although it is thinking about setting up SME funding schemes but has no model in place for it yet. The Industrial and Commercial Development Corporation (ICDC), founded in 1987, has come in as a potential investor partner on telecommunications projects e.g. second GSM operator bid in 1999.[38]

The majority of companies interviewed started their businesses through their own financing, friends and family, angel investors, and in the case of some of the larger telecomms and IT companies through retained earnings. This has limited their growth potential.

Some ICT projects have been funded through donor funds (USAID, IDRC, etc) or grants from the World Bank.

There has been some minor venture capital activity in Kenya but nothing was identified in the ICT industry. There are a few firms that do invest in equity stakes such as Actis, African Alliance and Trans Century, but not in the ICT sector. The CDC Acacia Fund was also brought up during discussions but general feedback was that there was little understanding of intellectual property (IP) and intangible assets such as software.

Most private equity investors tend to be interested in fairly large investment opportunities, which make them an unviable option for small ICT companies.

Corporate lending rates in Kenyan shilling denominated loans vary roughly between 10-16%, which are loans with a three-to-five year repayment period. In addition to the poor knowledge among banks of the ICT industry, funding is constrained by the lack of a legal framework (no intellectual property law, no law against computer fraud), poor corporate governance, and corruption.

[38] http://www.cck.go.ke/headline/releasenews/head1999.htm

3. Review of Seven Primary Segments

3.1 Infrastructure (Telecom, Wireless, Cable)

The following table provides a summary of the licensed telecomms operators in Kenya:[39]

Table 5: Licensed Operators

Types of Operators / Services	Licensed Operators
Fixed Line operators	Telkom Kenya Ltd (TKL) (national monopoly operator till July 2004) Bell Western – regional operator in North East Province
Mobile operators	Kencell Communications Ltd Safaricom Ltd Econet Wireless (licensed September 2004)
Public Data Network Operators (PDNOs)	8 operators: Telkom Kenya Ltd (TKL) Kenya Data Networks Ltd Simbanet.com Ltd Open Systems Technologies Ltd Pegrume Ltd Interconnexion Africa Ltd Azicon Engineering Ltd Broadband Access Ltd
ISPs	75 licensed – 35 are operational
IXPs	Kenya Internet Exchange Point (KIXP)
Value added services (VAS)	Interactive Media Services VTS Fone Worx
Local Loop Operators	EM Communications Ltd Next Generation LTD Soliton Systems House Ltd Pace Systems Ltd
National Commercial VSAT operators	Telkom Kenya Ltd Alldean Satellite Network (Kenya) Ltd

Fixed Line Access

Telkom Kenya Limited (TKL) was, until June 2004, the monopoly telecomms operator. A five-year exclusivity period was granted in 1999 to allow the operator to pay off its debts, increase its network infrastructure and restructure itself to prepare for competition. In reality, as the figures below illustrate, there was little improvement in service delivery, either in quality or quantity.[40] The lack of competition in the fixed line market resulted in high tariffs and long waiting lists for fixed lines.

The average rate of growth of fixed lines has been 15% rising from 112 861 lines in 1981 to a figure of 327 000 by November 2003. The figures provided by the CCK for November 2003 are as follows:[41]

[39] Waema, T (July 2004), pp12; Mureithi, M (2004). Kenya Telecommunications Sector Performance Review 1999 – 2003, pp 13-14

[40] Muriuki Mureithi. Kenya Telecommunications Sector Performance Review 1999 - 2003

[41] Most of the figures quoted in this section are taken from the recently completed study by Dr Timothy Waema for the CCK, dated July 2004. These findings were presented at a workshop held in August 2004.

Table 6. Basic Fixed Line Telephone Indicators as of November 2003

Exchange Category	No	Exchange Capacity	Total Exchange Connections	Payphones	No Waiting for Lines
Digital	204	384 830	256 091	8 120	80 234
Analogue	40	112 300	68 019	1 629	27 323
Manual	162	11910	2 959	276	2509
Total	406	509 040	327 069	10 025	110 066

Most fixed lines can be found in the cities of Nairobi and Mombasa, with the latest available figures from 2002 showing teledensities of 7.92 and 1.43% respectively. The estimated number of rural lines in 2001 was 8.7% of the total. TKL has not been able to meet its rollout obligations and was fined by the CCK for non-delivery.

CCK did however introduce Regional Telecommunications Operator Licences (RTOs) to liberalise local fixed line services outside of Nairobi. To date, only one operator, Bell Western, has paid its licence to operate in the North Eastern Province. No commercial operations are yet in place and systems testing is underway.

TKL has experienced under-utilization of its switching capacity, which can be largely attributed to the consumer move towards mobile telephony.

As of June 2003, the exchange capacity was 543 636 lines, whereas the actual number of connections amounted to only 325 605. Figures from TKL indicate that 67% of its capacity was unused by the end of 2003.[42]

Mobile (Cellular) Networks

There are presently two mobile operators in place - Kencell and Safaricom. A new third mobile operator, Econet Wireless, was assigned a license at a bid price of USD27 million in August 2004.[43]

Safaricom has been in operation since 1997 but relaunched its operations in 2000 with a financial injection of US$20m from Vodafone (UK). Safaricom is 60% owned by TKL and 40% by Vodafone. In July 2004, it had a total subscriber base of 1,7 million.[44] It currently employs 600 – 700 employees and has 450 installed base stations. Geographic spread covers about 20% of the country. Operations are funded through internal cash flows. 85-90% of its subscriber base is serviced through a network of dealers, with 15% serviced directly through Safaricom.

Kencell was granted its license for GSM operations in 2000 its present subscriber base is about 1,2 million (July 2004).

Final Inception Report: Universal Access to Communication Services: development of a Strategic Plan and Implementation Guidelines.

[42] Muriuki Mureithi. Kenya Telecommunications Sector Performance Review 1999 - 2003 p 15

[43] CCK, 19 August 2004 http://www.cck.go.ke/headline/headlinemain2004.htm#econet

[44] Pers comm., CEO of Safaricom, July 2004

The two operators currently have more than 2.9 million subscribers, having shown remarkable growth since the end of 2003 when subscriber numbers were quoted at about 1,9 million. The CEO of Safaricom believes that the potential market for mobile subscribers is currently about 15 million.

Installed capacity, as at November 2003, was as follows:

Table 7. Installed Capacity
Mobile Operators[45]

Operator	Total Capacity (Nov 2003)
Kencell	754 000
Safaricom	1 800 000
TOTAL	2 554 000

According to Safaricom, Kenya has the highest SMS usage/capita in the world, which provides ample opportunity for future value-add services.

Satellite

There are presently two satellite operators – TKL and Alldean and five companies currently providing Metropolitan Area Networks (MAN) / WANs in Kenya.

1. **UUNET** has recently launched its UUSAT service, which largely supports intra-corporate VSAT services.[46] This offers 64k – 2mB uplinks and up to 10 Mbps downlinks.
2. **Wireless Broadband** – provides wireless broadband access with 32k -1.5Mbps links via point-to-point VPN tunnels with substantial coverage in Nairobi and Mombasa. Costs start at KES 12 500 (USD 154) for dedicated 64 VPN tunnels.
3. **Alldean Satellite Networks Ltd** - a VSAT provider with headquarters in Nairobi - its main business focus is on East Africa, although its footprint covers several southern and west African countries. It provides VSAT networks for voice, data and video services as well as broadcasting. In Kenya, Alldean manages the connectivity of the Postal Corporation of Kenya (PSK) and many cyber cafes across the country. Its clients include 12 Kenyan banks, 300 gas stations and 30 branches of Uchumi, a supermarket chain. The majority shareholders are Kenyans. Its strength lies in its rural/remote telephony with 15 installation teams based in seven towns.
4. **IP Planet** - currently claims to be the leader in market share in IP, backbone connectivity and VSAT in Africa. IP Planet provides satellite internet backbone connectivity, submarine fiber communication, internet via VSAT/Hub, internet telephony (VoIP), integrated IP solutions and data storage solutions.
5. **Azicon** – provides wireless services via a radio network in the major towns, with bandwidth and costs similar to those of Wireless Broadband.

[45] Waema, T (July 2004). *Final inception report: Universal Access to Communication Services*. p 35. Sourced from CCK
[46] Daily Nation – Business Week – 20 July 2004.

WorldSpace, an international satellite radio operator headquartered in Washington, DC, has embarked on an ambitious project to provide satellite connectivity and content to 22 000 primary and secondary schools in Kenya. In the first phase, which includes audio service only (no video), the service has been deployed to 7 500 schools in remote areas. Via satellite, WorldSpace delivers specific curricula by teachers in centralized locations, the idea being to deliver high-quality uniform teaching curricula to all school children. The curricula are developed by the Kenya Institute of Education (KIE), which has a five-year development contract with WorldSpace. The funds for the project so far have come from government subscriptions, corporate sponsors, and international donors. Private schools, which are part of the project, pay the costs themselves. World Space plans to replicate the project in other countries. It has also plans for a healthcare application whereby medical information is broadcast to doctors in the field. WorldSpace presently has two satellites in place with a footprint covering the whole of Africa and a large part of Asia, with plans to cover South America.

Cable

Plans are underway for Kenya to partner in the SAT-3/WASC/SAFE project - the East Coast submarine cable. The Kenya Pipeline Corporation (KPC) is proposing an inland link between Mombasa and Nairobi and discussions are underway to consider further linkages into Uganda. The intention is to install a fiber-optic backbone to support its own telecommunications needs along the pipeline- this does present new opportunities to expand its telecomms infrastructure into underserved areas along the pipeline. Based on the feedback from the industry interviews, the submarine cable is desperately awaited and it is expected to open up new opportunities and enable new business models to flourish in East Africa. A potential optical cable manufacturing plant is under discussion.

Telecommunications Investment Costs

Recent estimates [47] are that Sh54 billion were spent on expanding the telecomms infrastructure in the past four years. Of this total amount, TKL spent Sh14 Billion (26%) as compared to the two mobile operators Kencell and Safaricom, who are estimated to have spent Sh20 billion each (37%).

3.2 Internet Access

There are presently about 35 operating Internet Service Providers (ISPs), as compared to 44 in 2000 and over 70 in 2002. The decrease in viable ISPs illustrates the restrictive environment in which ISPs have been operating. One of the major inhibiting factors was the monopoly, through Jambonet, on the provision of international gateway services. The end of the exclusivity period should result in more competition and lowering of prices. Swiftglobal, founded in 1994, has the largest IP backbone and is the largest ISP after TKL.

ADSL is a new service in Kenya, which currently costs approximately USD250/month for a 256k download link at the lowest service level.[48]

The ISPs have set up an Internet Exchange Point (IXP) for the peering of local traffic. This has resulted in lowered costs for in-country internet traffic.

[47] The Nation 10 June 2004

[48] TKL Website, September 2004 http://www.telkom.co.ke/ADSL%20Services.htm & http://www.telkom.co.ke/ADSLTariffs.htm

Mobile-based internet services are being provided through the creation of partnerships between ISPs and mobile operators e.g. Kencell and SwiftGlobal (with Kenya Data Networks (KDN)) – USD 9million has been invested to extend the network, which now covers 60 - 65% of the country. KDN has assumed responsibility for setting up the multi-switches and microcells in Kencell's 300 cell sites. Safaricom and Wanachi Online have formed a similar alliance. Access speeds are low at 9.6 - 14.4 Kbps and costs range between KES 5 – 10 per minute (USD 0.06 – 0.12) for GSM / 2.0 G connections; and speeds of up to 115.2 Kbps and a cost of KES 0.40 per Kb (USD 0.005) for GPRS / 2.5G.Although costs are relatively high, the use of GSM for Internet access has increased due to the better geographical coverage provided by the mobile operators. TKL has recently increased its internet access fees by 75 percent.[49]

Bandwidth costs for ISPs are presently USD 5 000 / Mb through TKL; a recent court case awarded Fastlane, a consortium of seven ISPs, the right to compete with Jambonet for the provision of an international gateway. Fastlane's bandwidth costs will be about USD 1 000 / Mb, which should assist in bringing down internet access costs.

3.3 Software and ICT Services

The IT industry in Kenya is characterised by a few large companies, and the majority being smaller IT companies of 3 – 10 staff. There are very few medium-sized companies. Most of the large IT companies are represented e.g. HP, IBM, Microsoft, Oracle, SAP, Sybase and Samsung. Some of the larger local companies include Symphony (the second largest IT company), Fintech Group and ICL East Africa. These are involved in hardware, software and related IT consulting and training services with staff complements of more than 250. The national and regional offices tend to be small and characterised as distributors and resellers of products and services.

Little local innovation and development takes place, except in specific industry applications e.g. insurance, healthcare, financial services and web development services e.g. There are a number of companies interested in developing industry wide healthcare information systems, which include the development of Industry databases and systems to interconnect healthcare providers using a variety of technologies. These initiatives are driven by the need to improve services in an industry characterised by long payment and verification lead times and high costs.

Most large opportunities for the ICT sector exist through government ICT contracts and e-government initiatives along with some banking and petroleum industry projects. Due to the high levels of corruption in the awarding of government IT tenders, there is general suspicion towards the IT sector for non-delivery.

The industry is not regulated and competition is driven by market forces. One of the major issues raised by both the industry players and ICT users is the lack of ICT standards and/or accreditation. This has resulted in a poor perception of the ICT industry with service quality being a major obstacle.

The penetration of IT services into rural areas is generally very low, and offices tend to be concentrated in Nairobi and Mombasa.

[49] Sunday Standard 1 August 2004 http://www.eastandard.net/intelligence/intel31070423.htm

Software piracy is a major problem for software providers and estimates are that more than 75 - 80% of software is illegal. The legislation as it stands provides inadequate protection for intellectual property rights, as it states that prosecution can only be undertaken if the person earns income off the pirated software. Most of the corporate software pirates are known to Microsoft, for example, which is working with the Kenya Copyright Board to find solutions. A DotNet user group was started by about 75 software developers to address various issues related to dotnet technology, including the issues of piracy protection.

Estimations are that there is currently about 3 –5 % usage of open source software (OSS). The major hindrance has been the low levels of expertise in developing OSS, and generally high development costs for Linux solutions.

Current estimates are that only 5% of the population are using any form of software. The potential growth potential is estimated at 15% (If secondary schools and current Schoolnet initiatives are pursued), indicating that there is still some opportunity in the market.

There is little local software development. Microsoft is customising some of its software to Swahili and Amharic for its regional users.

Some companies have formed alliances with international partners based in the UK, India, and East and South Africa. These partnerships are stronger in their ability to compete for large IT contracts and government tenders.

3.4 Enabling Technologies and Solutions

The major focus is on large ERP and inventory management systems. JD Edwards has carried out a few ERP implementations in Kenyan companies, primarily in the petroleum, soft drinks and manufacturing sectors. SAP has been implemented in a larger number of companies primarily in the power, transport and petroleum sectors (See Section 2.3.3). The smaller ERPs include Navision, Accpac, Great Plains, and Sun Accounts systems. There is no clear data on the total installed base but the table below is an indication of the market.

Table 8. ERP Installations in the Kenyan Market

ERP	Target	Comments
SAP	Large Enterprises and Governments	Current installations include: KPLC, Kengen, Kenya Ports Authority
Oracle Financials	Large Enterprises and Governments	Government of Rwanda, Uganda
Baan ERP	Large Enterprises	Firestone, Bidco, Unga
Sage Line 500	Medium size enterprises	KWAL, General Motors
Navision	Medium size enterprises	
Syspro	Medium size enterprises	
ACCPACC	Medium size enterprises	James Finlay, BASF EA
Sun Systems	Medium size enterprises	Unilever Kenya, EABL
Great Plains	Large/Medium Enterprises	
JD Edwards	Large/Medium Enterprises	Shell & BP

Source: Symphony Consulting

3.5 ICT Enabled Services

The Kenyan government has identified Business Process Outsourcing (BPO) as a key opportunity to grow the IT sector. This includes the establishment of call centers and the outsourcing of financial and IT services. [50] The proposed EPZ (Export Processing Zone)[51] has included BPO as part of its strategy. A Netherlands–Kenya collaboration is under discussion for setting up an ICT outsourcing center for small, medium, and micro enterprises (SMMEs). The focus is likely to be on packaging and horticulture. Currently there are a number of call center initiatives under development but CCK has issued only one license – to KenCall EPZ (Kenya) Ltd. It holds the first call center permit to operate an international voice gateway via satellite earth station so that it can carry its own business calls. A number of ICT companies saw the development of a call center industry as an opportunity, but indicated that the telecomms and general enabling environment would have to be improved.

3.6 ICT Distribution

The ICT industry in Kenya is largely composed of distributors and resellers of imported equipment. One of the major challenges facing distributors is the tariffs on imported goods. The Table below illustrates the tariffs due on various types of equipment. TESPOK is presently lobbying with the government to move towards a flat 3% rate on all ICT equipment.

Table 8. ICT Products Customs Duties Compared to Estimated Import Volumes

6 Month Period (July – Dec 2003)		Declared Value KES (k)	Imports Actual[52] KES (k)	Current Duty
Units	**Type**			
8471	Systems	2 436	2 500	**0%**
8473	Parts	139	500	**15%**
8524	Media	25	35	**5%**
8517	Telecomms	701	1 000	**15%**
	Radio	250	500	**25%**
	Software	347	1 000	**0%**
		3 898	**5 535**	

Source: Kenya ICT Federation, 2004

3.6.1 Software

Most of the large multinational software companies have a presence in the major centers in Kenya. These include Microsoft, IBM, Oracle, Sybase, SAP, SPSS and Network Associates. Most of these offices are small, or depend on partnerships with local business partners.

[50] The new Minister of Information and Communications addressed the Kenya Club in London in late September on the steps government is taking to encourage BPO in Kenya. This is being done in collaboration with the National Outsourcing Association in the UK.

[51] The focus areas for the proposed EPZ include: horticulture / food processing; textiles / apparel; handicrafts / gift items; leather products; ICT (Presentation by Peter Wainaina, EPZ authority, 23 September 2004)

[52] Imports actuals are market estimates for the period July – December 2003

Microsoft has a small regional office in Nairobi, with a staff complement of 17. It manages East Africa (Uganda, Tanzania, Ethiopia, and Kenya). Microsoft works through an extensive reseller network. Product support and skilled support staff for Microsoft products are readily available. Many private training institutions offer courses to support Microsoft products e.g. MCSE. Microsoft is presently investigating a scheme for employees to purchase legal Microsoft software at Ksh 25 – 30k. To date support and availability of skilled and support personnel for Microsoft are readily available in the market place. Little research and development takes place locally.

3.6.2 Hardware

Most of the major hardware multinationals are represented through a good distribution and reseller network in the cities and larger towns. These include HP, IBM, Sun Microsystems and Dell.

There is little local assembly of computers, a major reason for this being the higher tariffs payable on components as compared to the importation of complete units. Mecer, a South African computer firm, has set up an assembly plant in Kenya.

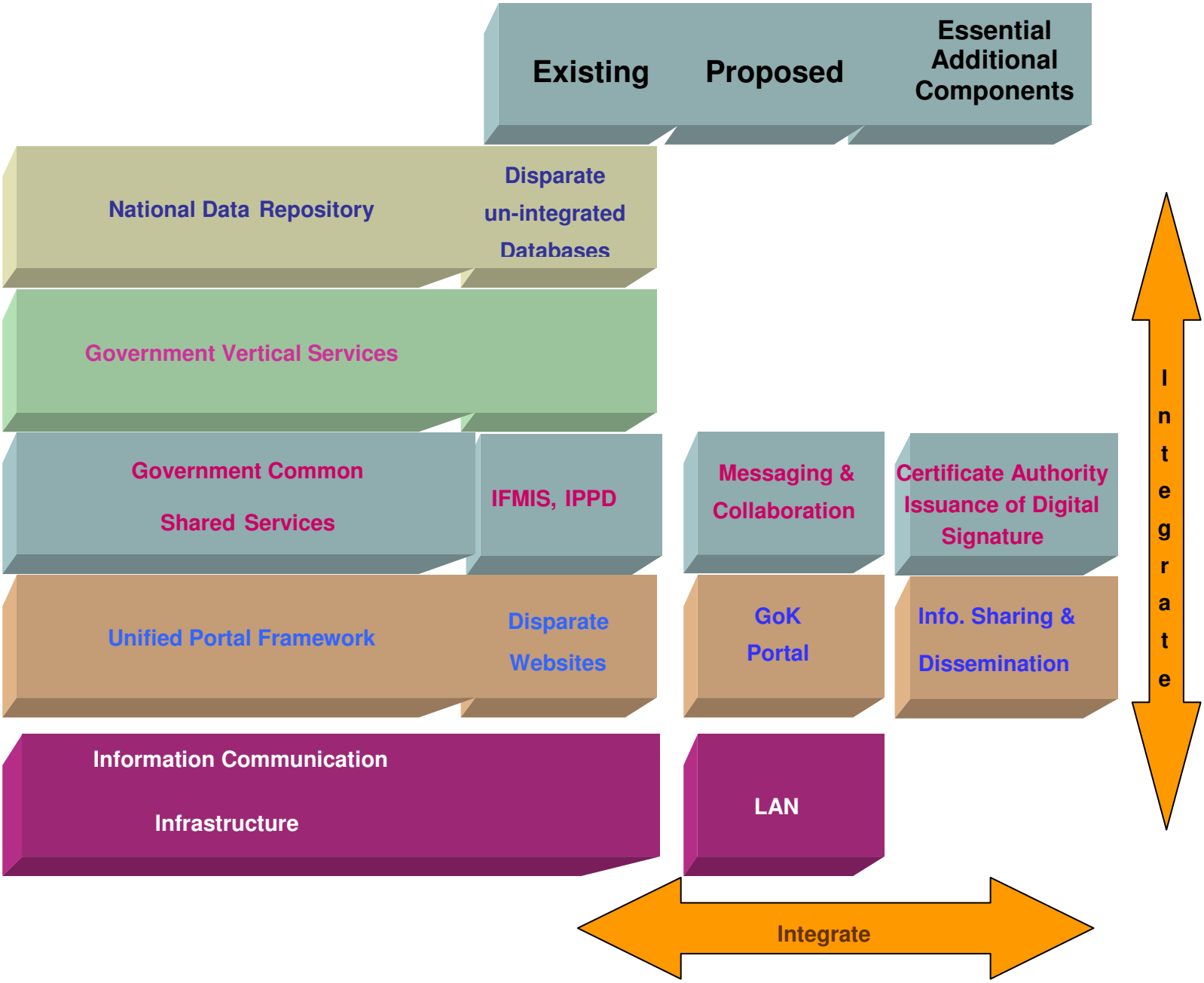
3.7 e-Government Initiatives and Modernization

The Government of Kenya is presently undertaking a number of e-government initiatives, underpinned by the need to re-engineer its business processes. Most of the resources have been invested in the Integrated Financial Management Information System (IFMIS) and the Integrated Payroll System (IPPD), planned for completion by 2007. A recent terrorism-proof passport issuing system, approved under the Government IT services (GITS) department of the Ministry of Finance, has come under fire for corruption and incorrect adherence to tender procedures. Anglo Leasing was given an order worth Sh2.7 billion for this contract. Two permanent secretaries and high-ranking officials at the Treasury and the Attorney General's chambers were fired as a result of this scandal. The effect has been an increased wariness towards the ICT sector.

Short-term projects include the creation of a Government portal, and increased connectivity within and between Ministries. The existing government communications infrastructure (e-mail, LANs, internet access) is being extended through the ExecNet project. At this stage only a few Ministries have been fully connected.

Other proposed medium-term projects are listed in detail in Section 2.2.4 as part of the e-government strategy and implementation plan.

The diagram below illustrates the status of existing and proposed e-government initiatives in Kenya.



Source: Dr W Sitonik, GITS[53]

[53] Extracted from a presentation made by Dr W K Sitonik , Director: Government IT Services, at the National ICT Convention in March 2004

4 Trends and Market Opportunities

4.1 Key Trends

Kenya has experienced a number of exciting developments in the ICT sector during 2004:

- A very ambitious e-government strategy that, if implemented, will create numerous new procurement opportunities for the private sector. This will however require upgrading of the ICT skills levels of government procurement officials if fair and transparent procurement procedures are to be followed.
- The appointment of the new Minister of Information and Communications has generally changed the perceptions of the ICT sector from pessimistic to cautiously optimistic since July 2004. The extensive ICT experience, both abroad and in the region, of the Minister and the Permanent Secretary, are seen as very positive for accelerating change in the ICT policy and regulatory environment.
- The CCK's recent drive to assess universal access strategies may result in specific interventions to address improved telephone penetration and affordable access in rural areas.
- The end of the exclusivity period for TKL and Jambonet in June 2004 has already started opening up competition through the likely appointment of an SNO and competition in the provision of international gateway services, VSAT and other services.
- The Economic Recovery Strategy for Wealth and Employment Creation (ERSWC) has identified the ICT sector as an investment focus area (albeit at an extremely low level). Likewise the Investment Promotion Center includes ICTs as an area of opportunity
- The East Coast submarine cable project is likely to provide major investment opportunities, but on the flip side, provide more affordable technology for a broader spread of users throughout the country.
- The formidable growth of GSM and other mobile networks and the subscriber base is likely to continue for at least a few more years before saturation is reached. The potential market for value-add services should give rise to new opportunities for software applications developers in areas such as health, citizen information, entertainment, sport and tourism. Almost all new applications are being built on wireless platforms. At the same time, long distance fixed-line traffic has reduced by 15%. There are many ICT entrepreneurs with ideas and concepts looking not only for funding but hoping for increased competition in the market place and more predictability in the policy environment.
- The demand for broadband services is rapidly increasing in industry, government and tertiary education, which makes the need for new and expanded fiber-optic networks even more critical.

There are however a number of areas that require attention if Kenya is to achieve its potential in growing the ICT sector.

- More investment needs to be made in developing a more innovative culture that promotes increased ICT entrepreneurship and research and development. The move towards establishing incubator centers is a first step towards achieving this goal.
- The establishment of venture capital funds for the ICT sector is probably the largest stumbling block for growing the IT sector.
- Intellectual property laws and e-commerce legislation must be addressed to encourage new foreign direct investment (FDI) in ICTs. Software development is hindered by the high levels of software piracy that cannot be addressed through the existing legal system.
- Clarity is needed on the tariff ratings for imported ICT equipment and consideration given to zero or low tariffs to bring down the costs and promote more widespread use of ICTs, thus growing the demand side.
- Fast-tracking of the liberalization of the telecommunications sector.

4.2 Investment Recommendations

Investment opportunities are most significant in the telecommunications sector, with the recent opening up of the markets to new competitors. The IT sector, and particularly the software industry, is plagued by the lack of venture capital and a lack of understanding of the financing of intangible assets. Present IFC investment options are unlikely to find investment opportunities in these markets, despite some interesting possibilities in software applications. The financing requirements generally range between USD 50k and 500k for the IT sector. Potential investment opportunities are listed below:

Telecommunications

- The East Coast submarine cable and inland fiber-optic networks, including expanding networks into Uganda;
- Wireless applications - liberalisation of the VSAT market, WiFI, VOIP services, rollout of GPRS / UMTS;
- Metropolitan Area Networks(MAN) Voice and Data Networks for large urban centers (some already in place);
- Competition for the international gateway and provision of broadband;
- Provision of internet backbone services;

ICT Software Applications

- Online payment processing and e-Banking / GSM-based systems – this could also result in the need for more local content applications
- e-Health e.g. health management information systems;
- e-Learning – e-learning platforms for tertiary institutions and schoolchildren of all ages;
- e-Government systems as outlined in the e-government strategy;

ICT Enabled Services

- Business Process Outsourcing (including call centers) – this is unlikely to be an opportunity unless telecommunications costs can be lowered;

- Expanding the facilities of the Kenyan Post Office to provide e-mail and electronic money transfer facilities;
- Creation of a network of telecenters and business support centers that can provide telephony and internet access. This could include the formation of rural IT cooperatives that provide opportunities for SMMEs in rural areas.

4.3 Developmental Impact of Investments

The primary need in Kenya is related to universal and affordable access i.e. access to basic telephony and eventually internet access. The secondary need is for a better quality of life and access to education, from primary school to the tertiary level.

Investment in the East Coast submarine cable and proposed extensions into the country should have major benefits for providing affordable access to the largely poor and rural populations of Kenya.

The e-government strategy, when fully implemented, is likely to result in a significant part of the country's civil service (one of the largest employers) becoming ICT literate. This should have significant spin-offs in terms of creating demand for increased ICT products and services and eventually more demand for higher-end IT solutions. In the longer-term, the provision of government services in the smaller towns and districts will have a major impact on rural communities who will no longer need to travel as far to have access to government information such as the registration of births, marriages, deaths.

The successful introduction of Computers in Schools for Kenya (CSFK), and their computer refurbishment projects, will result in a more computer-literate young population with more marketable skills and improved access to better learning materials. Likewise KENET, through providing cheaper internet access to tertiary institutions, will improve the quality of education and access to information for both lecturers and students.

4.4 Potential Partners

Although there was interest from a number of players in the IT market, it is unlikely that large investments can be absorbed in this subsector. The majority of investment partners are likely to be in telecommunications infrastructure, particularly with the recent opening up of the market to competition in both fixed and mobile.

4.5 Policy Recommendations

The greatest requirement to promote growth in the ICT sector will be to fast track the ICT policy (including universal access) and e-commerce policy processes, so that strategies and implementation plans can be put in place. This is likely to create more certainty for potential investors. Telecommunications regulatory reform is required to liberalize the market – the regulator needs to be strengthened to deal with the increased number of players in the market. A stronger emphasis is needed on developing realistic implementation strategies and to deliver on set targets spelt out for the e-government strategy. This will also require transparent government procurement and tendering processes, with strong measures in place to prevent corruption.

5. Concluding Comments

The ICT sector in Kenya is small but with its skilled ICT labor force and recent changes in the government's approaches to liberalization, some promising opportunities are likely to emerge in the short term.

Investments are predominantly in the telecommunications sector as funding requirements in the IT software and services sectors will require smaller investments in the region of USD50 000 – 300 000. The creation of venture capital funding is needed to address this gap in the market and will need to take addressed if the potential of this component of the ICT sector is to be unleashed.