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BUSINESS OPPORTUNITIES WITHIN THE IT AND TELECOMMUNICATION INDUSTRY

KENYA

Ministry of Foreign Affairs of Denmark
Danida

Business Opportunity Study within the IT and Telecommunication Industry in Kenya

A sector study prepared for Danida
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Asiatisk Plads 2
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Phone: +45 33 92 00 00
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The Danish Federation of Small and Medium-Sized Enterprises (DFSME)
Islands Brygge 26
DK-2300 Copenhagen S
Phone: +45 33 93 20 00
Internet: www.hvr.dk

and

Growth Africa Consulting
Umeme Plaza
P.O. 17726 – 00100
Nairobi, Kenya
Phone: +254 (0) 20 387 10 77
Internet: www.growthafrica.com

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Kristian Granquist

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Executive Summary

The Kenyan ICT industry

The Kenyan ICT sector is still in its infant stage, though opportunities are arising. The government and the private sector are working quite harmoniously towards securing that Kenya has the necessary infrastructure, human resources, legal framework and access to finance in order to achieve the goal for the sector to contribute one fifth of the country's export. Large investments in a country wide fibre network as well as fast developments in the mobile information technology sector underlines this trend.

Opportunities in Kenya are mainly based on the softer ICT skills that the country possesses and the failure of current ICT providers in identifying and focusing on special needs of local companies. Kenya is well positioned as an exporter, since the country has much experience with exports from being the world's largest exporter of flowers and tea. Finally, the literacy rate in Kenya is among Africa's finest and there is access to qualified, trainable and IT-exposed employees.

Most companies in the Kenyan ICT industry are quite optimistic about the future of the industry and the country's utilisation of ICTs. Looking at statistics for the development of the industry over the past years and projections based on this, this optimism is understandable: The number of mobile subscribers have more than doubled the past two years, the use of SMS has almost trebled, and PC and Internet usage is growing steadily. The arrival of the submarine cables will further spur the fast development of the sector.

Even with conservative projections Kenya will by the end of the decade have 12.5 million mobile phone subscribers sending 10 billion SMSs annually and 2.5 million PCs catering for 5 million Internet users.

Key activities

The mobile phone sub-sector is the most vibrant of all ICT activities in Kenya. Of the industry's contribution of USD 1.56 billion to Kenya's GNI, mobile phone activities constitute USD 1,090 million, which equals 70 per cent. Besides the mobile phone sub-sector the other contributing sub-sectors in the ICT industry are:

- Fixed line telephony
- Broadcasting sub-sector (radio and TV)
- IT hardware (reselling and servicing) and software (configuration and development)
- Internet (infrastructure and services)
- IT training

In Kenya, 4,000 companies are dealing primarily with ICT. Moreover, many shops and kiosks also resell ICT related services; especially services and products relating to the mobile phone sub-sector, some even rely primarily on revenues from this source; similarly any smaller shop/office with a computer and an Internet connection offers web-café and other IT related services. One telecommunication company is said to have a dealer network of 3,000 companies and individuals alone, which has not been included in the estimated number of ICT companies.

There is currently no significant export of ICT products and services. However there are several start-ups who have successfully tapped into the outsourcing industry, primarily call centres, business process and data entry, and this area seems to have great potential for growth in the medium and long term.

The ICT industry in Kenya has over the past 3-4 years been liberalised, and for many areas licensing is now a mere registration procedure, though, one significant regulation still exist – namely, that the licensee must have at least 30 per cent local ownership.

Labour force

It is estimated that 10-15 per cent of the population have operated a computer in the recent past – equal to 4-5 million persons. The challenge in the training industry is the apparent lack of certification of the courses and schools, which makes it difficult for the industry to measure the level of the students and to validate whatever proof of education or training is presented. The availability of trainable employees for most ICT disciplines is relatively good, though companies must expect to invest a fair deal in introductory, on-the-job training. On average companies should calculate 3-6 months of training for a graduate to reach a level where he/she is a net contributor to the company.

The number of graduates from tertiary institutions majoring in IT and ICT related disciplines have increased significantly over the past 10 years. From less than 2,000 in 1995 to almost 10,000 in 2005. Nevertheless, this only account for 10 per cent of the 100,000 graduating from Kenya's public and private universities, and polytechnics and technical institutions. The number is expected to double by the end of the decade. The cost of labour in Kenya is, as in most of Africa, higher than Asian countries. Comparatively, the wage difference between Kenya and e.g. India or China is narrowing, mainly due to increases in salaries in these countries and introduction of improved employee conditions with its associated cost

Infrastructure

In a traditional sense, the ICT infrastructure in Kenya is not that good, as only few parts of the country is catered for in terms of copper lines. In a more modern sense, Kenya has a very well developed ICT infrastructure: 94 per cent of the population has access to mobile telephones (coverage), 90 per cent has access to FM/AM radio, 60 per cent to television and 40 per cent lives close to community or trading centres offering Internet connection (Internet Cafés). Both the Kenyan Government and private businessmen have invested heavily in the ICT infrastructure over the past 3 years. The two current mobile phone network operators and the country's premier public data network operator has respectively put up more than 1,000 base stations and laid 3,000 km of fibre optic cables in Kenya.

Most of the major hardware manufacturers are present in Kenya, either through own offices or appointed representatives. Hence, most IT equipment is readily available in the country, though one should not expect the latest developments to be present in the market until 2-3 months after being released internationally.

Key competencies

Currently, Kenya is strongest on the softer side of the skills scale, i.e. call centre, business process outsourcing, data entry; as compared to the high-end technical skills, i.e. hardcore programming, electronics manufacturing.

English is formally regarded as the main language introduced already in primary school - second grade. Hence, most Kenyans speak flawless and often unaccented English, which puts them at a global advantage in respect to call centres.

Among some of Kenyan's key competences not yet used in an ICT context are their artistic and creative skills. Universities and colleges churn out a significant number of graduates with majors or minors in fine art, and many of these graduates could, with little training, become valuable assets for graphics development for computer games, animated movies or 3D modelling for architects and engineers.

Concrete opportunities for investors and partners

Short and medium term	
Call Centre (In- and Outbound)	Internet Content and Commerce Solutions
Transcription and translation	Web Hotels and Hosted Server Solutions
Data Entry	Internet Security Solutions
Value Add Service for Mobile Phones	Graphics and Animation Development
Value Add Distribution of Mobile Phones	Computer Games
Application and Content for Mobile Phones	Animated Movies and Special Effects
m-Payment systems	Modelling for Architects and Engineers
Mobile workforce and Enterprise solutions	
Medium to long term	
Programming	
Assembling of hardware	

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1 Introduction

This study was conducted in Kenya in November 2006 and is a combination of desk study and meetings with instrumental organisations, companies, and persons within this sector. Please refer to the list Persons Met on the last page.

Kenya is still in its infant stage of developing an ICT economy, but the government and the private sector is working quite harmoniously towards securing the Kenya has the necessary infrastructure, human resources, legal framework and access to finance to realise its dream of having the ICT industry contribute 10 per cent to the national income and 20 per cent of its export. This is for example documented by the large investments in country wide fibre network and the fast development in Mobile information technology.

There exist a great deal of opportunities in the ICT industry in Kenya, especially if one wants to piggy-back off the great successes of the mobile phone companies and the Internet back-bone provider. But the opportunities are present thanks to Kenya's softer ICT skills and the failure of current ICT providers in identifying and focusing on special needs of local companies.

ICT development is not an objective in itself. It is a means to distribute information and educate people. The objective must be to eradicate poverty.
David Svarrer, Digital Age Institute.

Kenya is a country that is well positioned compared to most other African countries. Kenya is already an outward looking nation and one of Sub-Saharan Africa's largest exporters, e.g. Kenya is the world's largest exporter of tea and cut flowers. Thus the notion of exporting services and products is not a new one to Kenyan businessmen and entrepreneurs.

Furthermore, Kenya has one of Africa's highest literacy rates, relative to its size, the most secondary and tertiary graduates in the region, and the country's subscription to a relatively developed form of capitalism since its independence means good access to qualified, trainable and IT-exposed employees.

2 The future of Kenya's ICT industry

Most companies in the Kenyan ICT industry are quite optimistic about the future of the industry and the country's utilisation of ICTs by and large.

> **The prospect of the Kenyan ICT industry is very bright. Done right this sector within few years will count for the majority of the GDP**
> *Dr. Bitange Ndemo, Permanent Secretary.*

Looking at statistics for the development of the industry over the past years and projections based on this, this optimism is understandable: The number of mobile subscribers have more than doubled the past two years, the use of SMS (as an indicator for the versatility of the users) has almost trebled, and PC and Internet usage is growing steadily. The industry is preparing itself for a smaller explosion in usage expected with the arrival of the submarine cables and the consequent drop in connectivity prices.

Even with conservative projections Kenya will by the end of the decade have 12.5 million mobile phone subscribers sending 10 billion SMSs annually and 2.5 million PCs catering for 5 million Internet users.

Key indicators, ICT growth

	2004	2005	2006[1]	2007[2]	2008[2]
Mobile Phone Subscribers[a]	3,400,000	5,500,000	7,200,000	8,700,000	10,000,000
Mobile Phone Users [b]	8,500,000	10,000,000	12,000,000	14,000,000	16,000,000
SMS sent [c]	1.2 billion	2.2 billion	3.4 billion	4.8 billion	6.3 billion
PCs [d]	750,000	900,000	1,100,000	1,350,000	1,650,000
Internet Users [d]	1,000,000	1,350,000	1,800,000	2,500,000	3,500,000

1) Estimates based on figures as of 31st October 2006
2) Projections (conservative)
a) Source: CCK, Safaricom and Celtel
b) Source: GA Consulting 2002-03
c) Safaricom, Celtel and GrowthAfrica Consulting
d) Source: TESPOK, Computer Society and EPZA
e) Includes users accessing Internet from mobile phones

The government's goal of having the industry contribute 10 per cent of the national income by 2010 is, even with conservative projects, within reach; thus doubling its current total income to 3 billion dollars.

Concrete opportunities for investors and partners

Short and medium term	
Call Centre (In- and Outbound)	Internet Content and Commerce Solutions
Transcription and translation	Web Hotels and Hosted Server Solutions
Data Entry	Internet Security Solutions
Value Add Service for Mobile Phones	Graphics and Animation Development
Value Add Distribution of Mobile Phones	Computer Games
Application and Content for Mobile Phones	Animated Movies and Special Effects
m-Payment systems	Modelling for Architects and Engineers
Mobile workforce and enterprise solutions	
Medium to long term	
Programming	
Assembling of hardware	

3 Overview of the ICT industry

In terms of size measured on revenue created (GNI contribution) the Kenyan ICT industry can be divided into the mobile telephony sub-sector and the rest. Of the industry's contribution of USD 1.56 billion to Kenya's GNI the two mobile phone network operators (Safaricom and Celtel) contribute USD 865 million (2006 estimate) – supply to these organisations (of infrastructure and services) plus business from mobile phone handsets, accessories and associated services adds another USD 225 million, leaving the sub-sector contribution 70 per cent of the industry.

The significance of the mobile phone sub-section is also illustrated by the taxes collected and paid by the two operators: in 2006 it is estimated that Safaricom and Celtel will pay USD 350 million in VAT, corporate taxes and excise duty to the Government, or more than 5 per cent of the Kenyan Budget for 2006/07.

Million USD	**2006**	**2007**	**2008**	**2009**	**2010**
GNI (real, 2006 prices)	22,900	25,600	27,800	29,100	30,500
Income, ICT Industry	1,560	1,890	2,180	2,540	3,000
ICTs share of GNI	7.0%	7.5%	8.0%	8.9%	9.8%
Growth in ICT Industry		21.1%	15.3%	16.5%	8.1%

1) Economist Intelligence Unit and Government of Kenya

2) Ministry of Information and Communication and GrowthAfrica Consulting

Besides the mobile phone sub-sector the other contributing sub-sectors in the ICT industry are[1]:

- Fixed line telephony (Telkom Kenya)
- Broadcasting sub-sector (radio and TV)
- IT hardware (reselling and servicing) and software (configuration and development)
- Internet (infrastructure and services)
- IT training

The contributions of these sub-sectors are difficult to assess and may be skewed by large one-off investments like the submarine fibre-optic cables which will attract investments in the Internet sub-sector to the tune of USD 500 million in 2007 and 2008. Of the five sub-sectors mentioned, the fixed line telephony and IT training are the smaller, while the three others are estimated to yield USD 100-150 million each in total revenues for 2006.

The remaining ICT companies contribute only marginally to the economy, but may be of interest to investors as the potential is unexplioted in this regard. Some of the more interesting areas include assembly/manufacturing of electronic products such as radios, TVs, telephones (landline) and computers.

1) Newspapers, magazines and postal services not considered ICT in this report

Kenya is not evaluated according to the ISI (information society index) parameters.

Overview of major, licensed ICT companies in Kenya

Service	Operator
Fixed Line Operators	Telkom Kenya (includes CDMA license) Vtel (includes a GSM, CDMA, PDNO and Backbone license) Bell Western Telecommunication (rural telephony only)
Mobile Phone Network Operators (GSM)	Safaricom, Celtel, Econet (not operational), Vtel (not operational)
Local Loop Operators (CDMA)	19 licensed operators, only 8 are active – of them the largest are: Flashcom, Popote Wireless, Adtel, Rapid Communications
Public Data Network Operators (PDNO)	20 licensed operators, only 16 are active – of them the largest are: Telkom Kenya, Kenya Data Network, Uunet, Pegrume, GeoNet, SimbaNet
Internet Backbone and Gateway Services	Telkom Kenya, Kenya Data Networks, Jamii Telecommunications, UUnet, GeoNet Internet Africa Network, Sopanet Technologies, Comtec Integrations Systems
Public Internet Access Services (ISP)	51 licensed operators, only 17 are active – of them the largest are: Africa Online, Wananchi Online, Swift Global, Access Kenya, UUnet, JamboNet (Telkom Kenya)
Fixed Satellite Operators (VSAT)	Telkom Kenya, AFSAT Communication, SimbaNetHarun International, Comcarrier Satellite Services, Alldean satellite Networks
Value Add Services (Premium) [several sub-categories]	26 licensed operators – of them the largest are: Call Handling Interactive, Cellulant, Mobile Planet, Sasanet, 3Mice Interactive Media, VTS Fonework, Interactive Media Services, TrueAfrican
Radio Stations	46 licensed stations with different frequency allocation in Kenya – in Nairobi the largest of the 29 licensed stations are: Kenya Broadcast Corporation, BBC Swahili Service, Kiss 100, Capital FM, Nation FM, The Citizen, Other Royal Media (Kameme FM, Coro FM, Inoro FM, Ramogi FM etc.)
TV Stations	16 TV stations are licensed – the active stations include: Kenya Broadcast Corporation, Kenya Television Network (KTN), Nation TV (NTV), Metro (KBC), STV (Stellavision), Citizen (Royal Media), Channel 5 (East Africa Television), Family TV
Computer hardware companies with local presence	HP, Lenovo, IBM, Dell, Fujitsu-Siemens, Toshiba, LG, Acer, Mecer [South African, local assembly] and Sahara [Indian] (other major hardware brands include: Xerox, Epson, Canon, Samsung)

3.1 Number and size of enterprises

The Kenya ICT Federation (KIF) estimates that there are 4,000 companies dealing primarily with ICT. Moreover, many shops and kiosks also resell ICT related services; especially services and products relating to the mobile phone sub-sector, some even rely primarily on revenues from this source; similarly any smaller shop/office with a computer and an Internet connection offers web-café and other IT related services. Safaricom is said to have a dealer network of 3,000 companies and individuals alone, which has not been included in the estimated number of ICT companies.

With the exception of Telkom, Safaricom, Celtel and Kenya Broadcasting Corporation all of these companies are small or medium sized[2]. Even though exact numbers are hard to get by and not necessarily reliable, it is estimated that roughly 250 companies are considered medium-sized enterprises employing 50-500 individuals each, leaving over 3,700 companies with less than 50 employees. Of these the majority is likely to be micro enterprises comprising of less than 5 employees each. Rough estimates put the total direct employment in the industry at almost 75,000. Official data estimate half of this, but these numbers do not take into account informal or unregistered business, nor do they seem to include any secondary employment generated by the industry.

3.2 Ownership and investment

Ownership

Due to regulations, all CCK licensed[3] ICT companies must have a significant component of local ownership, i.e. 30 per cent must be held by a Kenyan citizen (natural person). However this regulation is often omitted by larger international companies e.g. by appointing local technical partners who will hold the license – politically there is no effect, provided that a good part of the income remains on Kenyan hands.

Notwithstanding the regulation of Kenyan ownership, most medium and large companies are controlled by Kenyan investors and entrepreneurs and almost all smaller enterprises in the sector is owned and controlled by Kenyans. There is some degree of political anxiety about the future of the ownership situation as Indian and Chinese call centres and assembly plants have eyed Kenya as a potential destination for outsourcing as qualified labour slowly becomes less affordably in their countries.

2) *Standard Group and Nation Group are considered large-sized corporations, but the majority of the employment and revenue is from their print media business*
3) *Communications Commission of Kenya –Most companies in the telecommunications industry needs CCK licensing, see www.cck.go.ke for more information on licensing requirements*

Investment

In the past five years investment have been driven primarily by the mobile phone sub-sector and the infrastructure set up by the two operators. In addition to this 2005 and 2006 have seen an additional, significant investment in Internet infrastructure with KDN and the government connecting Mombasa in the East with the Ugandan border to the West as well as all major towns on the way. Furthermore, fibre-optic cables being laid in most parts of Nairobi as well.

Future investment is likely to come from Internet infrastructure projects, including the submarine cable systems commencing late 2006. Also the awarding of the Second National Operator and the privatisation of Telkom, including the government's sale of its Safaricom shares is also likely to spur a significant increase in the ICT investments in the near future.

3.3 Export of ICT products and services

There is currently no significant export of ICT products and services. However there are several start-ups who have successfully tapped into the outsourcing industry, primarily call centres, business process and data entry, and this area seems to have great potential for growth in the medium and long term.

Mecer, a South African computer manufacturer, has set up its regional assembly plant of desktop computers in Kenya. This plant exports 50 per cent of its output to other countries in the greater East African region.

Finally a lot of imported ICT equipment, especially mobile phone handsets, is re-exported to the neighbouring countries – however with no value addition taking place in Kenya.

3.4 Regulations and tax rules

The ICT industry in Kenya has over the past 3-4 years been liberalised, and for many areas licensing is a mere registration procedure rather than an application procedure. However, one significant regulation for all areas in need of licensing remains, namely that the licensee must have at least 30 per cent local ownership. This regulation does however not prevent a partnership from splitting its profit from the local cost centres and solely letting the cost centre hold the license, although this is politically unacceptable.

This fiscal year (2006/07), the Kenyan government introduced a zero rating of IT equipment and parts in respect to both duty and VAT. Besides this there are no special tax breaks for ICT investments. Mobile telephony usage attracts a 10 per cent excise duty, which is added to airtime and subscription together with VAT, leaving the effective taxation at 26 per cent.

Taxation overview

Corporate Tax	30%	37.5% for branches of foreign companies
Personal Tax	10-30%	Progressive scale
VAT	16%	0% on IT equipment and parts
Withholding Tax	5-30%	E.g. on royalties, management fees, dividend, interest and rent
Excise Duty on Airtime	10%	
Depreciation	33%	Declining scale

There is a general tax break for investors setting up in the Export Processing Zones or who list 30 per cent of its shares on the stock exchange. With larger investments the Kenya Investment Authority will often negotiate individual deals with the government.

There are no restrictions on repatriation of after tax profits, and Kenya subscribes to a number of International acts protecting international investors and providing framework for the settlement of any trade and investment disputes.

Employer taxation and responsibilities

Kenyan employers enjoy relative liberal conditions in terms of employee taxation and responsibilities. Besides general workplace insurance, which can be acquired at reasonable prices, and a minimal contribution to the National Hospital Insurance Fund (NHIF), no regulatory requirements exist. Rules on workplace environment are generally stricter than most Asian countries.

Starting up your own business

The process of starting a business in Kenya is both long and expensive. According to the 2006 World Bank 'Doing Business' indicators, a total of 13 procedures must be fulfilled taking an average of 54 days to complete. In comparison to other countries, Kenya is placed well towards the bottom at the 111th place in 2006 from a total of 175. In 2005 the Kenyan government abolished a number of licenses and created a single access point for entrepreneurs. An additional number of licenses were also being abolished or amended[4]. The report from 2006 suggests that this trend has been interrupted with the introduction of a separate procedure for payment of stamp duties. This has caused the lengthening of the entire procedure of starting up a business. Kenya is dedicated to improve on this situation.

There should be more transparency in the allocation of licenses and tenders. This will improve the market structure.
Jimmy Thande, Call Handling Interactive. Poul Mwachi, Metrocomia

4) *Source: the World Bank 'Doing Business' report of 2005*

The ICT sector consists of intellectual property. This can create some financing constraints as the security (collateral) is difficult to establish for an entrepreneur. Therefore a number of initiatives such as the Idea Factory embracing and supporting new initiatives providing incubating facilities have been established. This has resulted in a flourishing development in project ideas. It is the intention that these companies once incubated are ready to stand on their own feet and able to attract investors and capital.

3.5 Practical issues

Kenyan time is GMT +3, which leaves it at an advantage to many other countries in regards to outsourcing – especially call centres and business process outsourcing.

Working culture

The Kenyan working culture is one of the continents most developed. Since independence the country has adopted a capitalistic model, and even though some sectors and industries often have been dominated by parastatal monopolies, the Kenyan employee is used to a relatively stringent employment framework.

Working hours

The official maximum working week is 52 hours, though the normal working week is 45 hours. However most companies in the ICT industry have a work week of 40 hours, 5 days of 8 hours. The normal working week is Monday through to Friday, and normal working hours 8 am to 5 pm, including a lunch break of 1 hour.

Public holidays and annual leave

Kenya has 11 public holidays: New Years Day (January 1), Good Friday (varies), Easter Monday (varies), Labour Day (May 1), Madaraka Day (June 1), Moi Day (October 10), Kenyatta Day (October 20), Eid-ul-Fitr-Day (varies), Jamhuri Day (December 12), Christmas Day (December 25) and Boxing Day (December 26). Where any of these holidays fall on a Sunday, the next working day will be a holiday.

The minimum paid annual leave is 3 weeks, though most companies give 4 or 5 weeks. Most of the annual leave is often observed around Christmas and New Years, and business generally slows down significantly in second half of December and first half of January.

3.6 ICT industry organisations

Kenya has three ICT industry groupings taking care of and pushing the ICT agenda on behalf of the companies in the industry.

Kenya ICT Federation (KEPSA ICT Board)

The largest formal group is the Kenya ICT Federation (often referred to as the KEPSA ICT Board), which both is an umbrella organisation of 8 member organisations, as well as the ICT arm of the Kenya Private Sector Alliance (KEPSA). Its 8 member organisations are: Information Systems Audit and Control Association (ISACA), Telecommunications Service Providers Association of Kenya (TESPOK), Telkom and Safaricom Dealers Association, KENIC, the East Africa Internet Association, IT Export Services Association, Kenya Information Society (KIS), and E-Commerce Association of Kenya (ECAK).
More information available on www.kif.or.ke

Computer Society of Kenya

The second entity is Computer Society of Kenya (CSK), which is an older and internationally more affiliated organisation. It took advantage of the dot-com boom in the late 90'ies into the new millennium, however it has been relatively dormant the past years. It primarily consists of individual members.
More information available on www.cskonline.org

ICT Village

As many ICT companies have not felt the impact of KIF nor Computer Society, a small group took the initiative to form a third, more informal association, namely the ICT Village. The ICT Village has together with the Ministry of Information and Communication pushed for a renewed emphasis on ICT as a significant sector for employment and export. This led to the launch of the 2006 Kenya ICT Strategy.
More information available on www.ictvillage.com

ICT board

The government plans to establish a board consisting of representatives from the government as well as from the industry, training institutions and other stakeholders within the sector. The purpose of the board is to implement the ICT policy by transferring it into an ICT master plan. The Government pledge for open source platforms but this can in reality, as seen many other places, prove difficult to practise.
More information available on www.ict.go.ke

3.7 Political risk

There are no perceived political risks in the ICT industry in Kenya. The current government and any likely future governments are bound to value to potential ICT brings to the private and public sectors.

Besides developing the 2006 Kenya ICT Strategy and pushing for the implementation of the ICT act, the government has committed itself to digitise its operations by 2008, e.g. making forms and other paperwork available online, and thus accessible at any web café or office with Internet connection throughout the country.

4 The Kenyan ICT labour force

The educational level in Kenya is quite good. While 89 per cent of the population can read and write, 97 per cent of the youth (15-24 years) are literal – which is the best youth literacy in Africa and at par with countries like Mexico, Turkey and Brazil. The introduction of free primary education 2 years ago is expected to improve this even further.

Exact IT literacy numbers are difficult to obtain, but it is estimated that 10-15 per cent of the population have operated a computer in the recent past – not surprisingly, most of these 4-5 million individuals are assumed to be below the age of 40. Various organisations put the number of active Internet users in Kenya at 1.8-2 million, but also these numbers are affected by some uncertainty and may very well be higher[5].

As listed below, there are quite a number of places to achieve computer literacy. The challenge in the training industry is, however, the apparent lack of certification of the courses and training and of the companies providing the training. It is quite difficult for the industry to measure the level of the students and to validate whatever proof of education or training is presented. Further, some of the universities, especially the public, are suffering from old curricula laid down in government legislation. For example there is little training in safety issues related to anti spam, anti virus, and fire wall solutions. Further the latest languages in for example web design (.net) are not included in most curricula. This means that the training is not up to date and does not reflect the latest development within this rapid changing sector. Initiatives to remove curricula from legislation and to establish a different, more dynamic structure (frame work curricula) is under consideration.

It is important that the industry and the training institutions collaborate on a curriculum which matches the need of the industry.
Peter Kimacia, ICTvillage

The availability of trainable employees for most ICT disciplines is relatively good, though companies must expect to invest a fair deal in introductory, on-the-job training and technical assistance either via set training programmes or co-worker mentoring programmes. On average companies should calculate 3-6 months of training for a graduate to reach a level where he/she is a net contributor to the company.

5) *Most ICT estimates when verified have turned out to be 20-50 per cent higher than the estimates*

Kenyan universities and selected top IT colleges

Universities (Public)	Selected Top IT colleges	
University of Nairobi	Academy Business Computer	Infotech Training Centre
Kenyatta University	Africo Computer College	Institute of Computer Education
Moi University	Alma Computer College	Institute of Software Technologies
Egerton University	Andmar Computer College	Interactive Training Solutions
Jomo Kenyatta University (JKUAT)	Appropriate College of Computer	Kenya College of Management and Information
Maseno University	Associated Computer Services	Lanet Computer Training and Services
Universities (Private)		
	Belcom Computer Training	Learn It Computer Systems
Africa Nazarene University	Bits and Bytes	Logan Computer College
Aga Khan University	Bracyber Computer School	Macmaine School of Computing
Catholic University of Eastern Africa	Brans Computer College	Manami Computer and Management Training Institute
Daystar University	Cage Computer Institute	Mbaya Karichu Institute
East Africa School of Theology	Coast College of Commerce, The	Micronet Computer Training Supplies and Services
Kabarak University	Computer Prolific	Nakuru Computer Training and Services
Kenya Highlands Bible College	Computer School of Administration	Nsemia Information Technologies
Kenya Methodist University	Computer Training Centre	Office Automation Training School
Kiriri Women's University	Computer World Information Systems	Pekee Institute of Advanced Technology Ltd
Nairobi Evangelical Grad School	Computrain Secretarial College	Quality Integral
Nairobi Int'l School of Theology	Dataease Softwares	Research Innovation Computing Agency
Pan Africa Christian College	Davies Computer Training Institute	Rocky Computer College
Scott Theological College	Devdata	Rubicon Computer Training Centre
St. Paul United Theological College	Forrnax Computer College	Sajafe Centre of Business Studies
Strathmore University	Fourth Dimension Computer Services	Shameem's Secretarial and Computer College

Universities (Public)	Selected top IT colleges	
US International University (USIU)	Future Technologies	Springboard, The
University of Eastern Africa	Futurecom Computer College	Square Delta Computer Training
	Futurekids	St Anne's Training Institute
	Gigabyte Computer College	Technoform Computer Institute
	I T Kids	Tosha Learning Centre
	IAT - Institute of Advanced Technology	Wantech Computer College
	IITAL - Institute of Information Technology and Learning	Waterfords

Fairly accurate numbers are available for how many students that graduate from IT colleges annually and this number is expected to reach 200,000[6] in 2006 (short, medium and long term courses combined). This is equivalent to approximately 25 per cent of the *age class* (using the average of the 15-24 year age bracket of 800,000 individuals per *age class*), notwithstanding the fact that the same individual often goes for more than one certificate or diploma.

Most secondary schools are now offering classes in computer use and even though numbers of high school attendance are not increasing this will add 200,000 individuals to the work force every year with exposure to the use of IT.

The number of graduates from tertiary institutions majoring in IT and ICT related disciplines have increase significantly over the past 10 years. From less than 2,000 in 1995 to almost 10,000 in 2005. Nevertheless, this only account for 10 per cent of the 100,000 graduating from Kenya's public and private universities, and polytechnics and technical institutions, this number is expected to double by the end of the decade.

Cost of labour

The cost of labour in Kenya is, as in most of Africa, higher than Asian countries. Comparatively wage difference between Kenya and e.g. India or China is narrowing, mainly due to increases in salaries in these countries and introduction of improved employee conditions with its associated cost.

6) *Source: Computer Society of Kenya*

Monthly salary medians at different skills and experience levels

Gross monthly pay (USD)	No/little experience (junior level)	Some experience (intermediary level)	Vast experience (senior level)
Secretarial Staff	150	250	400
Back Office /(Call/Data Handling)	200	300	400
Systems Manager	200	350	500
Programmer	200	400	600
Designer	300	500	800
Programmer (high end)	400	600	1,000
Designer (high end, 3D/animation)	500	800	1,200
Electric Engineer	500	800	1,200
Account Manager/Consultant	250	600	1,200
Project Manager	500	1,000	1,500
Team Leader/Junior Manager	600	1,200	1,800
Mid Level Manager	800	1,500	2,500
General/Operations Manager (etc.)	n/a	1,200-3,000	3,000-7,500

Starting salaries, e.g. for graduates, are relatively low, but salaries – not just in the ICT industry – tend to increase with experience and organisational responsibility relatively more than elsewhere. For example, the difference between a not so skilled secretary and a very skilled may vary 3-400 per cent, and from an office clerk to a top manager 1,000 per cent and upwards.

5 Infrastructure and hardware availability

Kenya has, in African terms, a relatively good infrastructure. The road network, though not in as pristine condition as it could be, is extensive and connects all major towns and villages as well as the environs of all the primary and secondary urban centres. Like in many other capitals the traffic in Nairobi is an increasing problem creating traffic jams and waste of time. The government is aware of this and a number of circular roads are under construction to reduce the heavy traffic presently lead through Nairobi.

Energy provision and availability is, under the assumption that an investor does not need to locate away from the major urban centres, good.

In a traditional sense, the ICT infrastructure in Kenya is not that good, as only few parts of the country is catered for in terms of copper lines. This, however, opens up for investments in fibre route networks and at present a fibre network is under construction. The telecommunication provider (Telkom) has upgraded all of Nairobi and most of the secondary cities to a digital infrastructure. In a more modern sense, Kenya has a very well developed ICT infrastructure: 94 per cent of the population has access to mobile telephones (coverage), 90 per cent has access to FM/AM radio, 60 per cent to television and 40 per cent lives close to community or trading centres offering Internet connection (Internet Cafés).

Both the Kenyan government and private businessmen have invested heavily in the ICT infrastructure over the past 3 years. The two current mobile phone network operators (Safaricom and Celtel) and the country's premier public data network operator (KDN) has respectively put up over a 1,000 base stations and laid 3,000 km of fibre optic cables in Kenya. Furthermore, all of Nairobi is today covered by a mesh net also provided by KDN.

An important part of the digital development of the rural areas is the establishment of the Digital Villages partly based on fibre network and partly on mobile phone network. The perspective is that each individual can access the Internet (via computers or handsets) to pay for rent, utilities, order forms etc. thus avoiding to go to Nairobi or other main centres for administration.

Kenya has 17 active ISPs (Internet Service Providers) who all have their own radio-link infrastructure in place and a number of sites (coffee shops, restaurants or hotels) offer WLAN connection, often free.

Despite that fact that Kenya's internal and last-mile infrastructure is well developed, the bottleneck and cost driver of the industry remains Kenya's connection to the International telephone and Internet network, which today rely on an expensive and almost fully utilised satellite connection. Though fully liberalised, cost for bandwidth via satellite remains uncompetitive compared to a fibre-optic link. However, the government and KDN as well as a group of African governments and corporations, are in advanced stages of connecting Kenya to submarine fibre-optic cable systems different places in the Indian Ocean:

	Commencement date (expected)	Bandwidth (Gbps)		Connection point
		Initial	Max	
FALCON (Kenya Data Network)	Q1 2008	5	160	Yemen
TEAMS (Kenyan Government)	Q2 2008	5	160	United Arab Emirates
EASSy (Multi-Stakeholder Group)	Q3/4 2008	10	320	South Africa

The arrival of the fibre-optic connection is expected to result in a dramatic fall in connectivity charges. Reliable Internet connectivity will be available from USD 500 per month per MB, which is roughly the price for a 64 KB dedicated line today.

5.1 Availability of bandwidth

The recent liberalisation of backbone provision and the general competition between Kenya's 17 active ISPs has resulted in connectivity prices dropping significantly over the past 2 years. Generally prices have halved since mid 2004, but remain high due to the backbone provider's reliance on satellite connection.

Currently the reliability of all ISPs solutions is questionable as the bandwidth demand far outstretches the supply thus creating congestion at certain times during the day. Lunch hours and the period after working hours are notoriously congested.

Examples of connectivity options and prices

Products	Supplier	Bandwidth (Kbps)		Price	Connection/ Technology
		Downstream	Upstream	(USD/month)	
Dedicated Internet Access (SDSL)	Telkom	64	(one way)	522	DSL
ADSL (90 hours/month)	Telkom	64	32	80	DSL
ADSL (unlimited)	Telkom	256 - 1024	64 - 256	220 - 880	DSL
JamboNet (Dial-up Line)	Telkom	56.6	(shared)	1.4¢/min	Fixed Line
Mobile Office	Safaricom	72.4/384	(shared)	35 + 14¢/MB	GPRS/EDGE
ISDN 128	AfricaOnline	128	128	410	DSL
Infinity[1]	AfricaOnline	128	32	110	MeshNet
Broadband MAX[2]	Access Kenya	64	32	220	Radio Link
X-Plore / Business ADSL	WanachiOnline	256	64	230	DSL
Tund@fibre[3]	WanachiOnline	512	128	515	Optic Fibre
Fiber Optics[3]	SwiftGlobal	128	32	255	Optic Fibre
Access 350 [4]	SwiftGlobal	9.6/72.4	(shared)	7.0¢/min	GSM/GPRS

1) USD 225 installation cost 2) USD 450 installation cost

3) Only available certain locations in Nairobi 4) Only with Celtel

Due to the increased competition and lower margins, most ISPs have diversified into VoIP provision, which, couple with Telkom and the mobile phone operators introduction of VoIP based products, have seen prices of International calls plummet to as low as 7 US cent per minute. Notwithstanding, free VoIP services, such as Skype, can be achieved with Telkom's JamboNet dial-up service at 1.4 US cent per minute.

GPRS is available from autumn 2006. Kenya, Tanzania, and Uganda has established a one-mobile-coverage meaning that the expensive roaming is avoided while travelling in these three countries.

5.2 Hosted server services and web hotels

There are currently a very limited availability of hosted server solutions and web hotels in Kenya. Most of the companies host in USA or in Europe, mainly England. ISPs and PDNOs will quote on an ad hoc basis depending on the exact needs of the client. Generally, pricing is very high as no company has made this their primary business, thus no interest exist to lower prices and obtain volume. A few initiatives on fully fledged hosting (including top security and safety) have been drawn up on paper but lacks the final initiative and financing.

5.3 Electricity and stability of supply

Since 2003, Kenya has not had any official power sharing/saving and have enjoyed relative stable, though expensive (US¢ 9-16/kWh) supply of electricity to all major towns and their environs. There is an occasional (in periods weekly) power interruption, which necessitates all businesses relying on ICT for their operations to install uninterruptible power supply (UPS) systems and ideally have access to a stand-by generator. Most office complexes in Nairobi and many in the secondary cities already have such facilities installed. Extra UPS' for the individual computer or electronic machinery should be considered.

Electrification in the rural areas, however, is not well developed yet creating a challenge for the distribution of Internet access. Renewable energy such as solar is explored but is still too expensive for wide distribution. Hence, allocation of workstations to the Digital Villages should be based on portable computers using only a fraction of the consumption of stationary workstations.

5.4 Hardware and technical back-up and repair facilities

Most of the major hardware manufacturers are present in Kenya, either through own offices or appointed representatives. Hence, most IT equipment is readily available in the country, though one should not expect the latest developments to be present in the market until 2-3 months after being released internationally – most hardware resellers can organise for a special consignment, this will however be at unattractive prices.

Generally, prices are only marginally higher than in most European markets. Prices and availability of more specialised equipment may be a challenge due to the low volumes –

this includes high-end computers and servers, which may need to be imported individually.

Most of the hardware manufacturers represented in Kenya also have appointed repair centres. Kenya has relatively good access to hardware engineers, and all basic repairs can be made in the country, swiftly and at little cost if not covered by the warranty.

The scenario is similar in regards to networking – both in terms of the physical set-up/ maintenance and the network administration: individuals with basic skills are readily available and come at a reasonable cost. Experienced specialists, networking engineers and administrators are rare and quite expensive; however, many are being trained, but few get the chance to practise their skills.

6 Key competencies in Kenya's ICT industry

As Kenya still hasn't developed its full potential as an ICT economy it is difficult to pin point its key competences in this regard – much will change as new ideas and ventures develop.

Currently, Kenya is stronger on the softer side of the skills scale, i.e. call centres, business process outsourcing, data entry; as compared to the high-end technical skills, i.e. hard-core programming, electronics manufacturing.

English is formally regarded as the main language introduced already in primary school - second grade. Hence, most Kenyans speak flawless and often unaccented English, which puts them at a global advantage in respect to call centres – and with 200,000 high school graduates a year it is possible to grow a significant industry. The ICT sector can further benefit from the language competencies in almost all areas including programming and ICT solutions with substantial content of English narrative i.e. web sites.

Among some of Kenyan's key competences not yet used in an ICT context are their artistic and creative skills. Universities and colleges churn out a significant number of graduates with majors or minors in fine art, and many of these graduates could, with little training, become valuable assets for graphics development for computer games, animated movies or 3D modelling for architects and engineers.

7 Concrete ICT opportunities in Kenya

As with the key competences the opportunities in the Kenyan ICT industry are bound to change and develop over time. Kenya is already slowly proving itself as a viable outsourcing destination and the biggest current opportunity lies in creating call centres, as well as business process and data entry centres.

> **The way is up! Provided that the skills and methodology are upgraded along with the increase in the demand for ICT solutions from national and international customers.**
> *Moses Kemibaro, Dot savvy*

The arrival of the fibre-optic cable in early-mid 2008 will only improve on Kenya's competitiveness in this regard. This will also potentially mark the beginning of a leap in number of Internet connections as prices will decrease, spurring growth in the usage of the Internet. This includes a great potential in respect to providing a multitude of online services, from news portals over dating sites to online sales and brokerage.

One of the more obvious opportunities lie in provision of innovative value added services to Kenya's many mobile phone subscribers – especially services reaching the poorer (and larger) segment of the mobile phone users hold great potential. Mobile payment and commerce solutions could be one such application.

Though the number of highly skilled technical staff is still scarce there is still potential in the development of simpler applications, e.g. Java applications for mobile phones, or application needing mass customisation.

Mass customisation of content for mobile services and applications as well as the Internet might also be an area where Kenya could reap its softer ICT skills. Some companies already outsource world-wide content creation for the mobile phone to Kenya.

The absence of any significant web hotels or hosted server solutions is also another concrete and immediate opportunity with potential great returns. The market is in need of anything from basic, cheap products to high-end solutions. Same can be said about specialised security services (provision of anti-spam, anti-virus, firewall solutions) as no company has made it its primary product.

Finally, the identified potential key competence of graphics development may be a potential opportunity for computer game development companies, animation film producers and architects and engineers in Europe and North America, who find these tasks to laborious or too expensive. A significant amount of training and technical assistance may still be required to tap into this potential, though the returns also appear very interesting.

Appendix

Companies, organisations and persons met

The following persons and organisations were met during the study. Details can be obtained through int@hvr.dk

Company/Organisation	Name	Area of operation
Celltell	Michael Dabaly/Caba Pinter	Internet carrier
CHI Call Handling Interactive Ltd.	Jimmy Thande	Call Center
Corporate Identity and Branding	John Gikanga	Graphic Designer
Digital Age Institute	David Svarrer	Training and capacity building
ICT Village.com (owned by Idea Factory Limited)	Peter Kimacia	Online Business Portal
Idea Factory Limited	Peter Kimacia	Incubating and project idea development
Immobia	Briefed by Johnni Keldsgaard, Growth Africa	Mobile services and sms applications
KDN Data	David Owino	ICT infrastructure provider (mainly cables)
KenCall	Nocolas A. Nesbitt	International Call Centre
Kenya College of Computer Training (KCCT)	Saitoti Ntiyani	ICT training institution
Kepsa	Peter Kimacia	Organisation including a leg for the ICT sector
Metrocomia	Paul Mwachi	Web Design
Permanent Secretary Ministry of Information and Communication	Dr. Bitange Ndemo	
Preciss	Mugure Kabugua Mugo, Joe Kigara	Call centre, Transcription, Subtitling in English and Swahili
Preciss	Mugure Kabuqua Mugo, Joe Kigara	Call center, transcription, and data processing
SkyWeb-Evans Company	Gilda Odera	International Call Centre and Data Conversion
SoftLaw	Stephen Alda	Compiling and distribution of laws and legislations on the Internet or on CD. Incubator service (no training included). Translation and transcription
Vega Software	Ole Vestergaard Johansen	Software development. Standard MS products
Dotsavvy	Moses Kemibaro	Web design, interactive web pages, share points
EIM Solutions Ltd.	Mr Sartaaj S Rihal – Chief Technical Officer	SAP consulting and implementation company

MINISTRY OF FOREIGN AFFAIRS OF DENMARK
Danida

Asiatisk Plads 2
DK-1448 Copenhagen K

Phone: +45 33 92 00 00
Fax: +45 32 54 05 33
E-mail: b2b@um.dk
Internet: www.b2bprogramme.com
www.b2bprogram.dk

BUSINESS-TO-BUSINESS FOR DEVELOPMENT

HÅNDVÆRKSRÅDET

Phone: +45 33 93 20 00
Fax: +45 33 32 01 74
E-mail: hvr@hvr.dk
Internet: www.hvr.dk

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