

## Developing Smart Cities in Africa



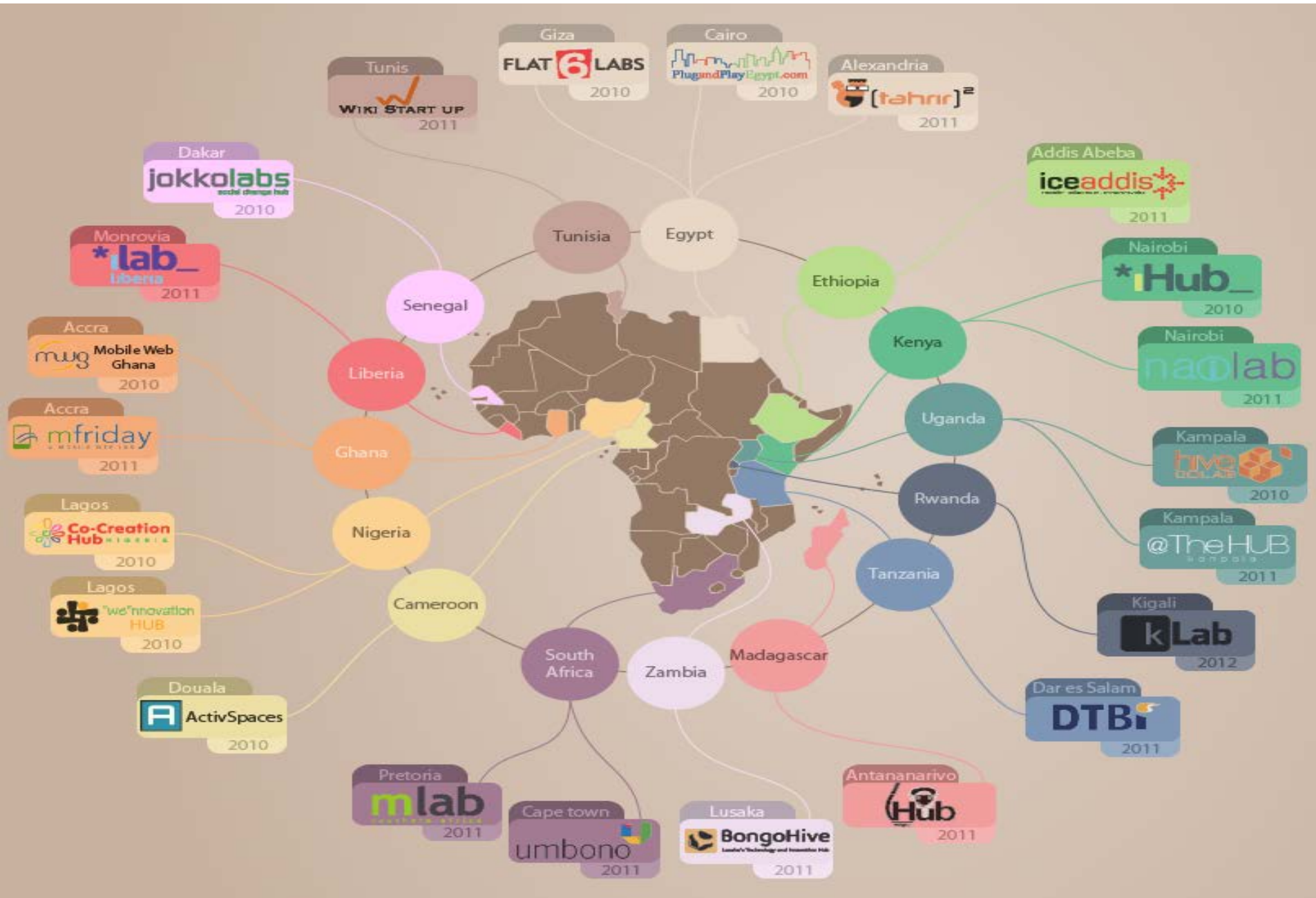
The Role of Technology Parks in improving  
the Competitiveness of the Region's Economy

- In stable economies, the development of smart cities via investment in technology parks and other IT infrastructure (i) provides fertile grounds for technology research (ii) facilitates incubation of startup firms (iii) speeds up growth of the technology industry and (iv) boosts knowledge sharing and technology transfer, among others.
- Technology parks (including the Innovation Hub in South Africa) and incubation centers (in Ghana, Cote d'Ivoire, Senegal, Nigeria, etc) has spawned innovation and competition that is projected to lead to more African inventions such as mPesa, mPedigree, etc.
- Africa's GDP is expected to reach \$1.6 trillion by 2020. This will represent 5% of world's GDP compared to 2.4% in 2010. Information and communications technology has directly contributed 7% to Africa's GDP in the last 5 years – higher than global average. **The World Bank estimates that a 10 percent increase in teledensity raises a country's Gross Domestic Product by at least 1 percent.**
- In this presentation, we will focus on Cote d'Ivoire, Ghana and Nigeria, three of the world's top 10 fastest-growing economies over the next 5 years (Source: IMF). The three countries, which lead West Africa in technology investments, have a combined GDP of \$580 billion (PPP, 2013), about 80% of the GDP of West Africa.

Africans are aggressively investing in developing tech hubs and smart cities.



There has been a proliferation of incubators and innovation centers in Africa in the last decade.



The World's 27th Most Competitive Outsourcing Destination (Source: AT Kearney).



- Official Language: English
- Population: 25 million
- GDP: \$84.1 billion (PPP) 2013
- GDP Per Capita: \$3,300 (PPP)
- Exchange Rate:  
1US Dollar = 2.97 Ghana Cedi
- Labor Force: 11.57 Million.
- Standard & Poor's Rating:  
B (2013).
- GDP Growth Rate: 7% (2013)
- Fastest growing industries:  
Technology, Real Estate,  
Financial Services, Tourism.
- Literacy Rate: 72.6%
- Inflation Rate: 8.8 %
- Ease of Doing Business:  
Ranked No. 1 in West Africa.

## Africa's 2<sup>nd</sup> Largest Economy



- Official Language: English
- Population: 170million
- GDP: \$450.5 billion (PPP, 2012)
- GDP per Capita: \$ 2,700 (PPP)
- Exchange Rate:  
1US Dollar = Naira
- Labor Force: Million
- Standard & Poor's Rating: BB- (2013)
- GDP Growth Rate: 7.6% (2013)
- Stock Exchange Market Cap:  
\$45.6 billion
- Foreign Reserves: \$36.4 billion
- Literacy Rate: 66%
- Inflation Rate: 12.9%

Nigerian companies increased their Africa investments by 80% between 2003 and 2013.

### Open for business?



- Official Language: French
- Population: 23 million
- GDP: \$41.4 billion (PPP) 2013
- GDP Per Capita: \$1,750 (PPP)
- Exchange Rate:  
1US Dollar = 480 CFA Franc
- Labor Force: 7.9 Million.
- GDP Growth Rate: 9% (2012)
- Fastest growing industries:  
Technology, Real Estate,  
Financial Services, Tourism.
- Literacy Rate: 60%
- Inflation Rate: 0.4%.

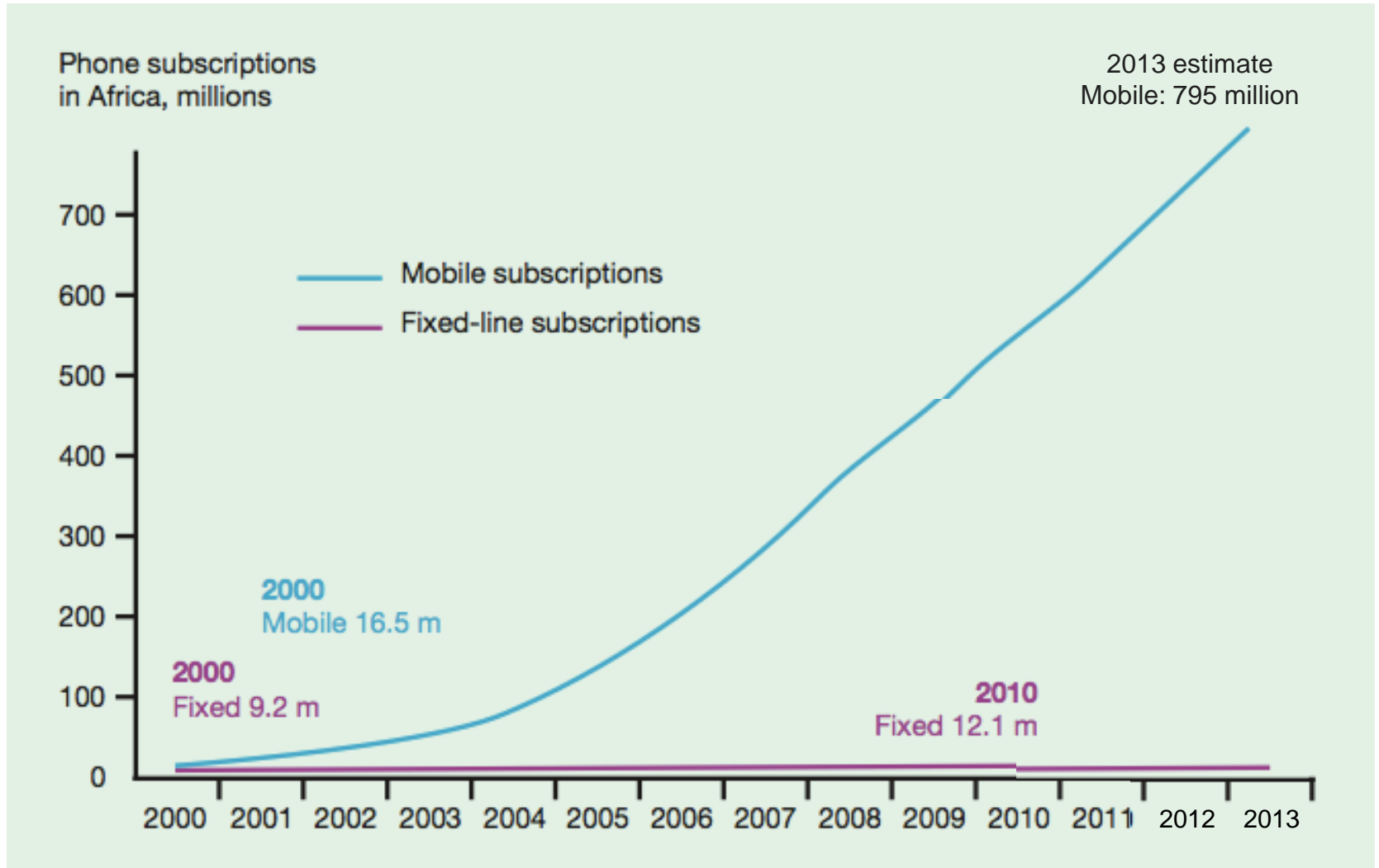
One of the world's fastest growing economies.

# Infrastructure



## Teledensity: Mobile and Fixed Lines

Since 2000, the mobile phone market has grown 40-fold, from 16.5 million (source: World Bank)



# Tech Infrastructure: Fiber Optics

Regional growth fueled, in part, by increase in broadband capacity.

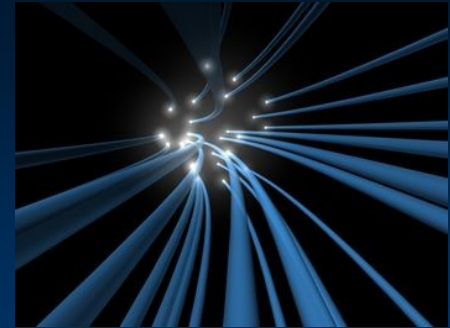
## SAT-3/WASC

South Atlantic 3/West Africa Submarine Cable.

First links to Europe for West and Southern African broadband consumers.

Operational Date: 2001.

Capacity: 120 Gbit/s. May be upgraded to 340 Gbit/s.



## WACS

West Africa Cable System.

Participants: Vodacom, MTN, Telkom South Africa, Broadband Infrasco.

Operational Date: 2011

Capacity: 3.84 Tbit/s



## MAIN ONE

Landed in Ghana in 2009.

Span: 14,000 km, between Portugal and South Africa. Dual Fiber pair.

Operational Date: May 2010

Capacity: 1.28-Tbit/s.



## GLO-1

Globacom-1

Landed in Ghana in 2009. Span: 9,500 km.

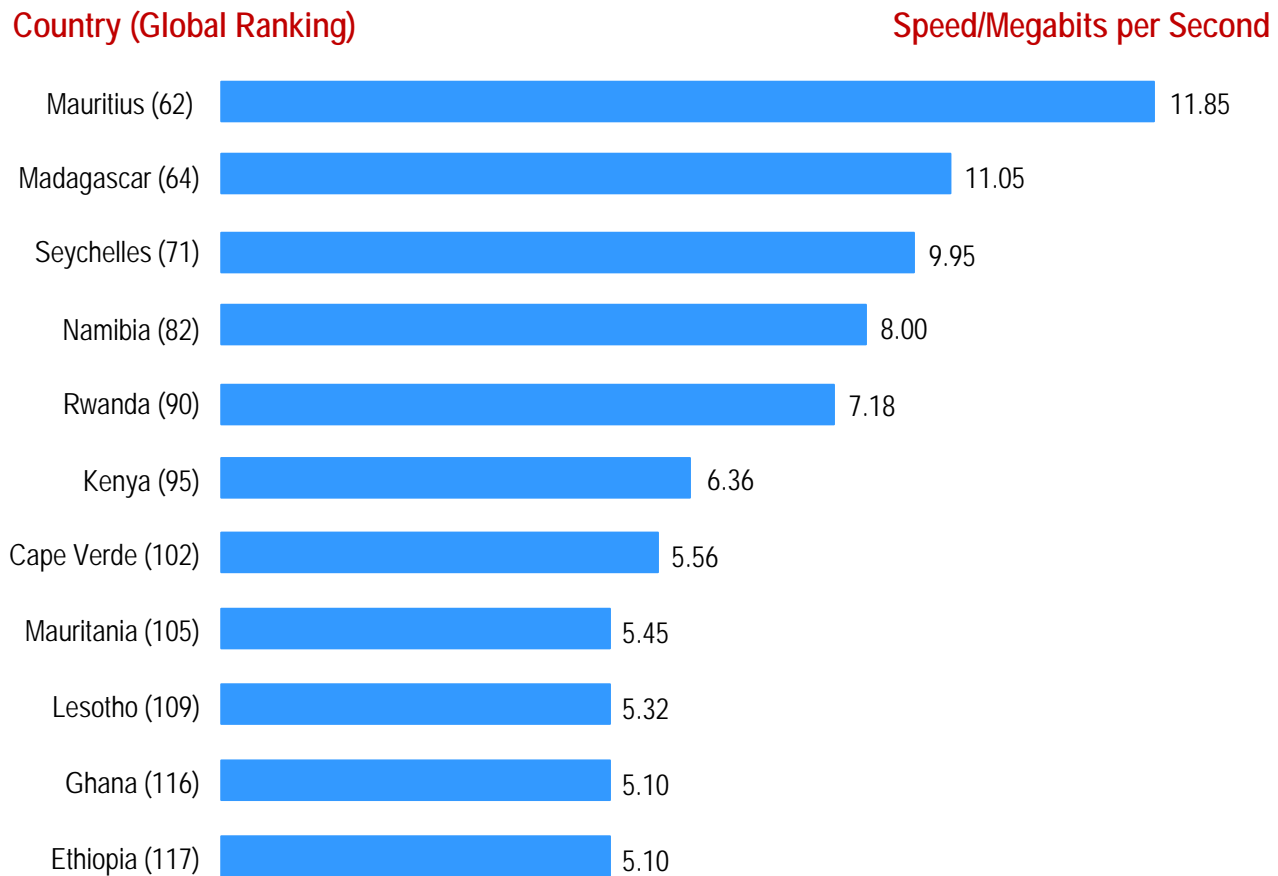
Minimum capacity: 640 Gbit/s



The growth of internet bandwidth capacity in Africa has increased 20x between 2008 and 2014.



## Internet Speed



# Ghana Cyber City

The New Technology & Innovation Hub of West Africa



Innovation made easy.

## BPO & Incubation

- BPO and Applications on Demand
- Software Dev.
- Data Processing
- Call Center Op.
- Incubation Svcs



## Data Center

- Storage and data svc & virtualization
- Server & security
- Network engineering
- IT svc consolidation & relocation services



## Hi Tech Mall

- Electronic products
- iHub
- Mobile tech
- Apps store & broadband center



## Engineering & Broadband

- Broadband Service
- 24-hour maintenance & tech support svc
- Hardware Mgmt
- Software, Peripherals



## Office Rental

- Workspace options
- Managed services
- Conference facilities
- Virtual Office



## Condominium

- Short-term rental
- Extended stay
- Permanent ownership
- Cooperative



Finance

# Mobile Money



Health





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25% of Kenya's economy flows through the mobile money service.

A mobile-phone based money transfer and microfinancing service that enables its users to:


- Deposit and withdraw money
- Transfer money to other users and non-users
- Pay bills
- Purchase airtime
- Transfer money between the service and a bank account.
- More than 65,000 agents across Kenya.
- 19 million out of Kenya's population of 44 million subscribe to M-Pesa. More than 2 out of 3 Kenya's use M-Pesa.
- 25% of Kenya's economy flows through the mobile money service.
- M-Pesa is the most developed mobile payment system in the world.



Eliminating counterfeit drugs could save 700,000 lives a year.

Mpedigree is a West African social enterprise innovation using world-leading technology to try to eradicate counterfeit medication in Africa and Asia.



 mPedigree and HP System for Fighting Counterfeit Drugs



A patient texts a code from the prescription drug package to a designated phone number.

mPedigree works with pharmaceutical companies to print a unique code on each package of drugs. When a patient texts a code, it is checked against the authentic codes stored in HP's secure cloud.

The patient receives an immediate SMS reply indicating whether the drugs are real or counterfeit.

Counterfeiting account for 30% of Drugs sold in Africa

## New ID System in Nigeria

Roll-out of 13 million MasterCard-branded National Identity Smart Cards with electronic payment capability.

New multipurpose identity card which has 13 applications.

The enrolment process involves the recording of an individual's demographic data and biometric data (capture of 10 fingerprints, facial picture and digital signature) that are used to authenticate the cardholder and eliminate fraud and embezzlement.



When fully utilizing the card as a prepaid payment tool, the cardholder can deposit funds on the card, receive social benefits, pay for goods and services at any of the 35 million MasterCard acceptance locations globally, withdraw cash from all ATMs that accept MasterCard, or engage in many other financial transactions that are facilitated by electronic payments.

# Challenges

## Challenges

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(1) Infrastructure Development: Africa needs to invest \$93 billion (14% of GDP) annually in infrastructure over the next decade, according to the World Bank. Africa currently spends over \$45 billion a year on infrastructure.

(2) Power Supply.

(3) Lack of tech and entrepreneurial skills (technical and managerial).

A World Bank-sponsored study in Ghana found a deficit of more than 10 percent in the supply of engineering and technical graduates and a deficit of 23 percent in the supply of graduates in management.

(4) Capital Flight: Illicit flows out of Africa between 1970 and 2008 - \$700 Billion.  
Current flow-rate: \$50 billion a year.

## Challenges

- Cost of telecom services is high due to insufficient bandwidth and lack of competition in international telecommunication segment.
- Limited telecom connectivity in the interiors (beyond Accra) and high setup time to establish last mile linkage.
- Quality of telecom service unsatisfactory – high fault rates, below-standard link uptime and inadequate customer support.
- Non-availability of adequate 'Grade A' ITES suitable real estate. Concept of 'shell' buildings, though envisioned, currently absent. High real estate rental rates.
- Real estate ownership and title procedures are cumbersome and unclear.
- Technology parks are currently in planning stage and unavailable.

## Strengths

- Partial liberalization of the telecom sector.
- Rise in Internet usage and penetration.
- Increase in teledensity driven by rapid growth in mobile telephony.
- Initiatives to introduce cost-effective technologies such as VoIP.
- Government support for real estate development by providing fiscal incentives to developers.

## Challenges

- Low employable workforce due to high drop-out rates at successive levels of education (primary to secondary to tertiary).
- Capacity constraints in tertiary education – indicated by low application to admission conversion ratios.
- Education course curriculum not in line with market demand.
- Availability of adequate technical and managerial talent in the long-term.
- Lack of foreign language capability.
- Low computer/IT proficiency at educational and business/commercial levels.
- High training requirements to reach requisite quality levels of service delivery.

## Strengths

- Availability of large talent pool comprising both graduate and floating population.
- Established educational system.
- English language proficiency.
- Low attrition and workforce adaptable to ITES work environment.
- Culturally compatible with Western countries.
- Lower labor cost in comparison with the United States and the United Kingdom.

## *Recommendations*

- (1) New curriculum relevant to market demand
- (2) Infrastructure Development
- (3) Incubation | Offshore Outsourcing
- (4) Private-Public Partnership
- (5) Tech and Business friendly Policies



### Flexible land-use policies providing the developers more choice

Flexible land use policies permit the developer to bundle IT office space construction with construction of other facilities such as shopping complexes, hotels, eateries, and housing complexes. Such bundling makes the project financially more attractive, given that the returns from the commercial/residential end use are typically higher. For example, in CFZ, Malaysia, 500 hectares of land has been zoned as commercial use. In Hitec City, Hyderabad, 40% of the net developable/usable area can be used for housing, a club house, recreational center, shopping center, a school, and other support activities.

### Economic Zone Enclaves

Provides tax incentives for tech firms.

### Linking incentives/subsidies with identified strengths/core competencies of domestic companies

In developing countries like India and Malaysia, most IT and ITES companies are export oriented, the major markets being the United States and Europe. It may be observed that governments in these countries offer a number of fiscal incentives on export income/profit. On the other hand in countries like Singapore, where the target market segment for most IT companies is high-technology, research-intensive products, the subsidies and incentives offered by government agencies are linked to R&D spending. Adopting fiscal policies to suit the strengths and markets of indigenous companies is an effective policy measure to promote the domestic industry.

## Tech Giants Compete for Partnership with Government

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HP is holding discussions with Government of Ghana on the possibility of setting up a plant in Ghana to assemble HP products. The deployment of HP's cloud-based and connectivity technologies by the Ghanaian Government and local industries can help build a strong IT industry, which in turn generates economic growth and innovative solutions that could make a positive impact in Ghana's communities



NEC

