



**Expert Group Meeting  
on  
Fostering African Private Sector in the Big Data Era  
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# **Fostering African Private Sector in the Big Data Era**

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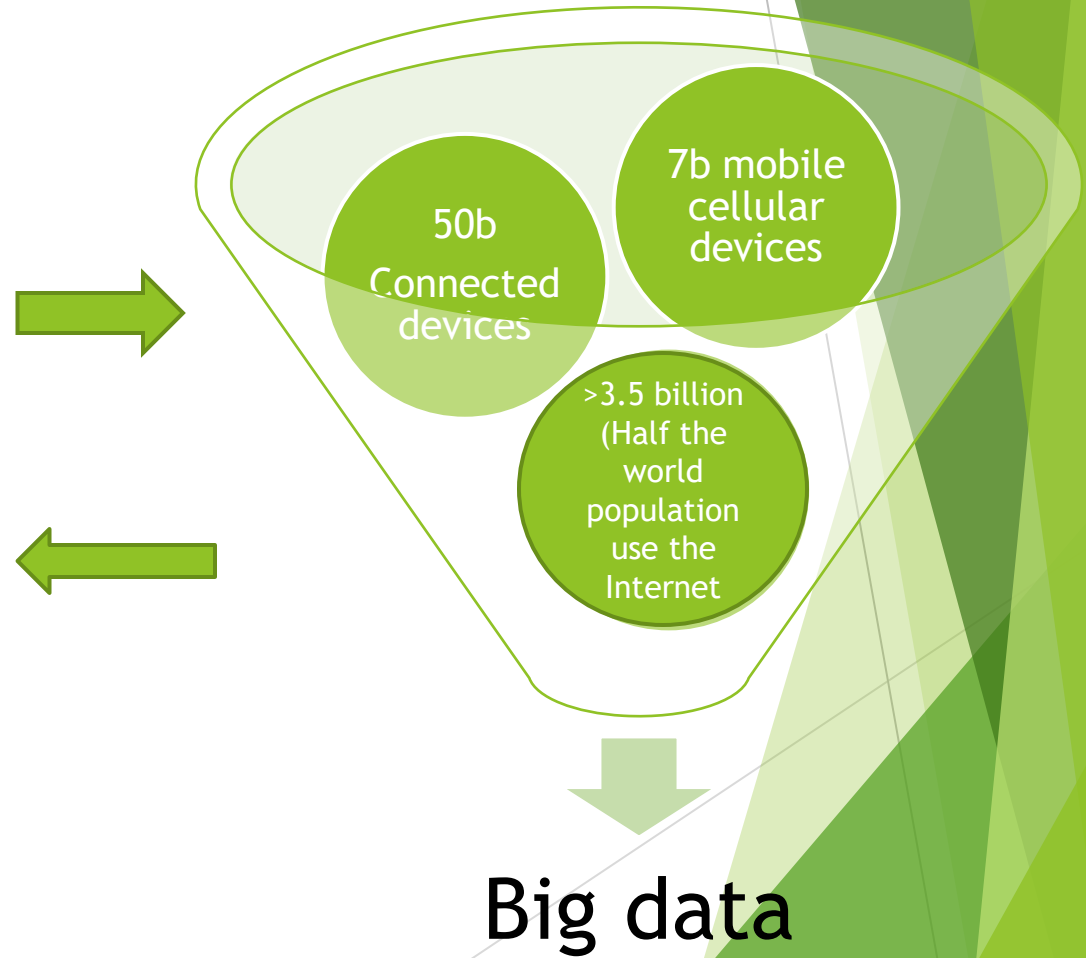
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# Introduction

In this globally connected world people, objects and connections are producing data at unprecedented rate both passively and actively.



Each of these are both data producer and consumer.



# Introduction (contd..)

- ▶ Africa faces challenges of lack of critical data for regional and international development policymaking
- ▶ Large data gaps coupled with poor data quality, lack of timely data, lack of disaggregated data, among the challenges
- ▶ As many as **350 million people** worldwide **not covered in by household surveys..** means more than a quarter people live on less than 1,25 USD a day.
- ▶ Hence it is critical to harness the potential of big data to enhance the data systems in the continent apart from the potential of Big data
- ▶ Several **benefits** associated to Big data particularly in context of **private sector** ranging from **better fact-based** and **fast decision making** to **improved customer experience**, **increased sales**, **new product innovations**, **reduced risk**, **more efficient operation** and **higher quality products and services**.



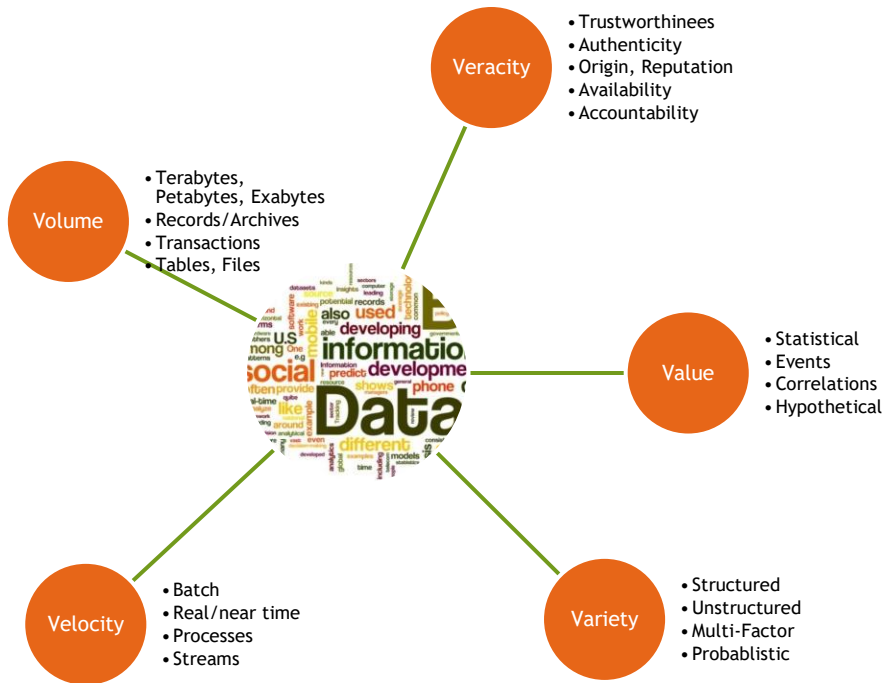
# Big Data and the Data Revolution

- ▶ The data revolution for sustainable development is defined as the integration of data coming from **new technologies** with **traditional data** in order to produce relevant high-quality information with more details and at higher frequencies to foster and monitor sustainable development. This revolution also entails the increase in accessibility to data through much more **openness** and **transparency**, and ultimately more empowered people for better policies, better decisions and greater participation and accountability, leading to better outcomes for the people and the planet”
  - ▶ UN SG Independent Expert Advisory Group
- ▶ The **speed** and **frequency** with which data is generated and transmitted and on the other hand the rise and **variety** of sources from which it originates..



# What is Big Data?

- ▶ *Big Data is high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation'*
- ▶ *Big data is characterized as data with increasing volume, velocity, and variety (Lanley, 2001)*





# Types of Big Data?

- ▶ Two different classification of Big data exist:
  - ▶ Classification by type (UNECE, 2013)
  - ▶ Classification by Size ((Dornik and Hendrey, 2015)
- ▶ Three categories of data by type
- ▶ Social media networks

Data Source	Data Type
Social Networks	1100. Social Networks: Facebook, Twitter, LinkedIn, etc. 1200. Blogs and comments 1300. Personal documents 1400. Pictures: Instagram, Flickr, Picasa etc. 1500. Videos: Youtube etc. 1600. Internet searches on search engines (e.g. Google) 1700. Mobile data content: text messages 1800. User-generated maps 1900. E-Mail



# Type of data (contd...)

## ► Administrative and businesses

### Traditional Business Systems

21. Data produced by Public Agencies  
Administrative data

22. Data produced by businesses  
2210. Commercial transactions  
2220. Banking/stock records  
2230. E-commerce  
2240. Credit cards

## ► Machine-generated data

### Internet of Things (IoT) (machine-generated data)

31. Data from sensors  
311. Fixed sensors  
3111. Home automation  
3112. Weather/pollution sensors  
3113. Traffic sensors/webcam  
3114. Scientific sensors  
3115. Security/surveillance videos/images  
312. Mobile sensors (tracking)  
3121. Mobile phone location  
3122. Cars  
3123. Satellite images  
32. Data from computer systems  
3210. Logs  
3220. Web logs





# Classification by Size

- ▶ Three types of big data based on size
- ▶ Tall (dimensions on a data set, (number of variables  $D$ , and number of observations  $N$  - represented by  $N \gg D$  *not too many variables but high no of obs (e.g. financial transactions, or search queries)*)
- ▶ Fat (high number of variables but not so many observations represented by  $D \gg N$  high-dimensional data (dimension larger than the sample size) - often method used - machine learning..)
- ▶ Huge - represent many variables and many observations  $\gg$  large no of  $D$  and  $N$ . Such data is referred to as multidimensional panel data



# Big data and Open data

- ▶ Open data
  - ▶ *‘publicly available data that can be universally and readily accessed, used and redistributed free of charge. It is structured for usability and computability’*
- ▶ Two features
  - ▶ Data must be publicly available for anyone to use
  - ▶ It must be licensed in a way that allows for its reuse
- ▶ A sub-set of open data > Open Government Data
  - ▶ is open data generated and released by local or regional Government ministries, departments and agencies (MDAs). Mostly, the National Statistical Office (NSO), with its mandate to collect, approve the quality of, and release official statistics, is also the key player in releasing OGD
- ▶ Other open data sets created or curated by - local and international NGOs, local governments, academic institutions and private organisations

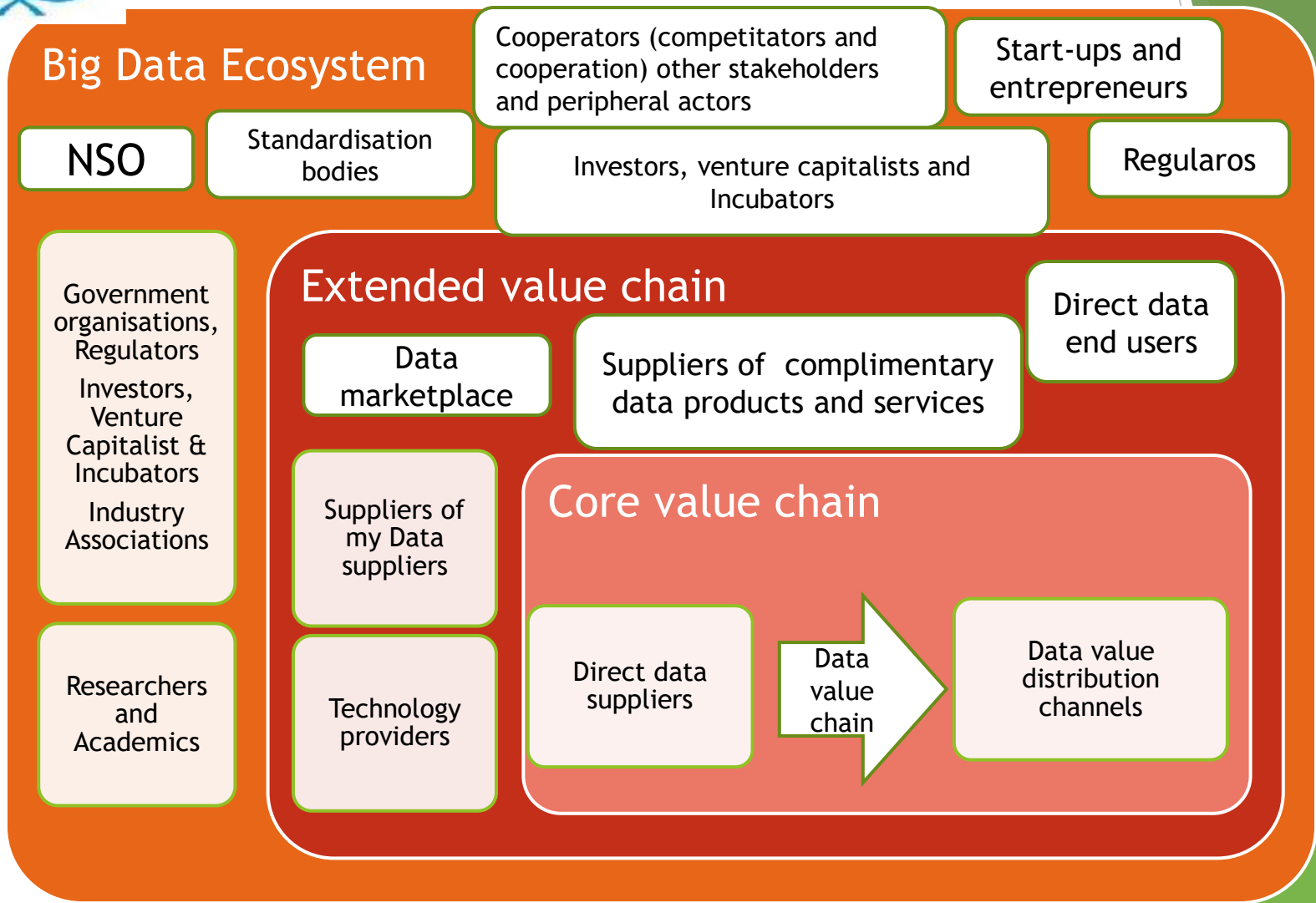


# Big data ecosystem

- ▶ Data environment supported by a community of interacting organisations and individuals -
  - ▶ Organisations, community, technology platforms, or within or across sectors
  - ▶ Established sectors with data ecosystems - healthcare, finance, logistics, media, manufacturing and pharmaceutical
  - ▶ Big data ecosystem supported by - data management platforms, data infrastructure and data services



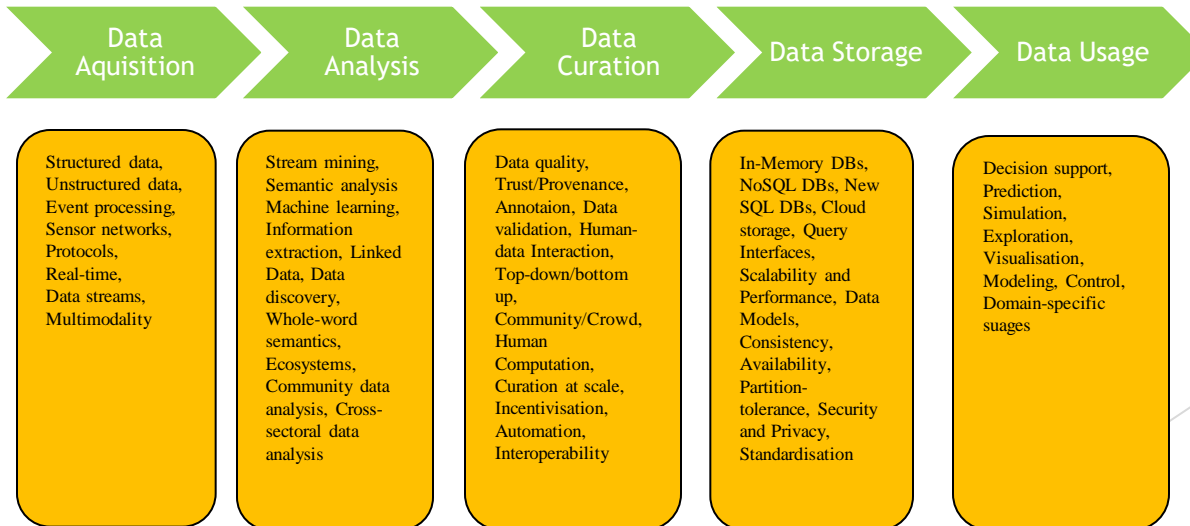
# Big Data Ecosystem





# The Big Data Value Chain

- ▶ A series of sub-systems each with inputs, transformation processes and outputs
- ▶ Information flows to understand the value creation of data technology
- ▶ Data/info flow is described as a series of steps needed to generate value and useful insights
- ▶ Models the high level activities that comprise the data ecosystem





# The Stakeholders in the Big Data Ecosystem and their roles

- ▶ Based on the EU data for policy report, the following types of types of stakeholders can be identified:
  - ▶ global and regional policy makers;
  - ▶ national policy makers;
  - ▶ regional policy makers;
  - ▶ statistical offices;
  - ▶ science and R&D organisations;
  - ▶ data brokers;
  - ▶ private providers of data analytics and visualisation tools;
  - ▶ civil society and
  - ▶ the policy analysis/evaluation community



# Big Data and the Private Sector

- ▶ Major contributor to most nations' GDP globally
- ▶ Need near-real-time data acquisition within the sector for growth strategies and expansion to reach extended market with a focus on innovation and cost
- ▶ Alternative data available in private sector attracted governments to engage with not only private sector but also academia, international organisation and CSOs to harness big data for mutual benefit



# Participation of the African private sector in the Big data market

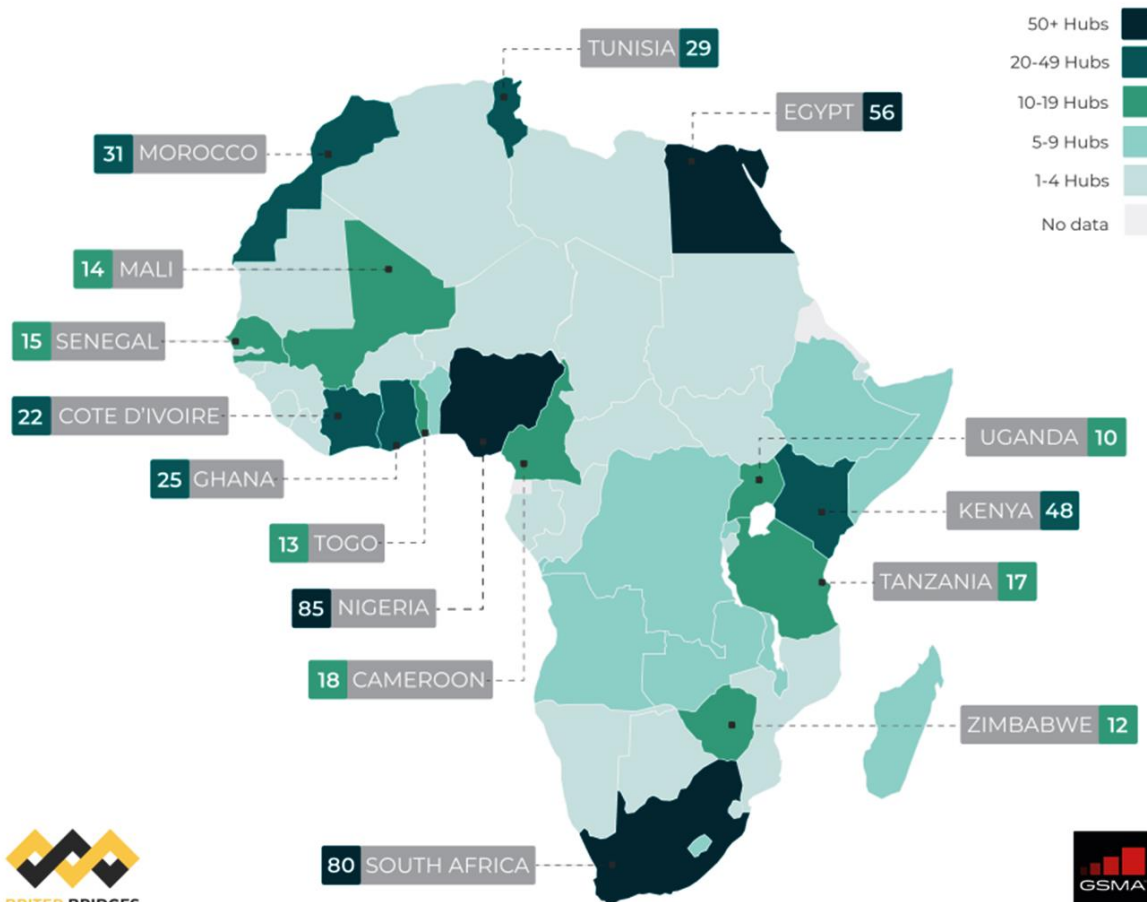
- ▶ Both home grown and multinational corporation companies focusing on big data both to inform their business growth strategies as well as in providing other organisations and companies to make sense of their customers and businesses
- ▶ IDC estimates
- ▶ Revenue from big data and analytics will increase by **11% this year in Africa and the Middle East to reach USD\$ 2 Billion**
- ▶ The African private sector participation in the global big data market is motivated by the increasing tech hubs in Africa with innovative solutions to the global market





# The growth of tech hubs in Africa

- ▶ According to GSMA and Briter Bridges, the tech hubs have reached 618 in 2019 which has jumped from 442 in 2018 which 40% increase in one year. The distribution of the tech hubs across the continent is s





# The growth of tech hubs in Africa (contd...)

- ▶ Tech hubs are distinguished by type of support or facilities they offer to entrepreneurs
  - ▶ Incubators
  - ▶ Accelerators
  - ▶ University-based innovation hubs
  - ▶ Technology parks, and
  - ▶ Co-working spaces (25% of active tech hubs)
- ▶ Nigeria (85), South Africa (80), Egypt (56) and Kenya (50) are among the top in the number of tech hubs
- ▶ African startups, mainly in the **IT sector raised more than USD\$ 1.1 billion in 2018**



# The Use of Big Data in development

- ▶ The tech business landscape together with the expanding ICT infrastructure and services enable growth of big data use in development
- ▶ Several use cases of big data in development. One of the areas where big data was early adopted among others is the healthcare
  - ▶ *Anonymised mobile call-data records (CDR) to track movement of people, map the spread of disease and target where the treatment centres to be built, e.g CDC work in Liberia*
  - ▶ *In response to the recent Ebola epidemic in West Africa, a big data app, RapidPro developed by UNICEF and Rwandan software co Nyaruka. The outbreak was limited to a small number of cases by cutting reporting time and helping authorities to trace people who may be in contact with infected people in Nigeria.*
  - ▶ *A Harvard University researcher used records from 15 million mobile phones in Kenya to track the movements of people in an effort to find hotspots where malaria was being transmitted.*



# The Use of Big Data in development (contd..)

- ▶ Other applications in agriculture
  - ▶ *Kenyan farming app FarmDrive not only allows smallholders to keep a record of their revenues and expenses, it uses that information to assess whether users are eligible for loans. Similarly, Cape Town's Jumo uses mobile data to conduct background checks.*
- ▶ Potential for start-ups and small businesses to scale up their data efforts, discovering new revenue streams and value adds for customers.
  - ▶ *SafeMoto - a Rwandan ride-sharing app that lets people hail motorbike taxis. Its big selling point is that it uses telematics technology to track driver behaviour and kicks those with a low safety score off the platform.*



# Business opportunities in big data use in governments

- ▶ In many countries public sector entities gather enormous amount of data, e.g. tax returns, public health surveys, census etc.
- ▶ Making good use of big data needs collaboration of various actors including data scientists and practitioners, etc.
- ▶ The public sector cannot fully capture the potential of big data without active participation and leadership of private sector
  - ▶ Data philanthropy - companies sharing data for public benefit
- ▶ In this collaboration private sector and government to help track diseases, avoid economic crises, relieve traffic congestion, and support development.



# Big data in government

- ▶ Big data in the public sector refers to the use of non-traditional data sources and data innovation to make government solutions more responsive and effective
- ▶ Government as producers, consumers and facilitators (creating legal and technical frameworks) of big data
- ▶ Use areas of Big Data in Government

## Service delivery

- Big data analytics can be used by governments to improve existing services
- to draw on novel datasets to drive entirely new public services

## Policy making

- Policy makers can use satellite imagery, cell phone data and more to produce alternative economic indicators for new and real-time - policy insights

## Citizens engagement

- By applying technologies such as machine learning to online and social media, governments can be more responsive to citizen sentiment, opening up new dimensions of civil engagement



# Big data in Government (contd...)

- ▶ Public information and shared data from private source can help create **USD\$ 3 to 5 trillion a year** of value in seven areas of the global economy (McKinsey, 2013)
  - ▶ education, transportation consumer products electricity, oil and gas, healthcare and consumer finance
- ▶ The African private sector tapped into this market and World Bank survey identified the open data driven companies in Africa.
- ▶ Accordingly, the Digital Data Divide reached to 41 companies in 11 countries and identified:
  - ▶ 34% of these companies were located in Kenya
  - ▶ 27% in South Africa
  - ▶ 10% in Nigeria
  - ▶ 7% each in Ghana and Tanzania
  - ▶ 15% Cameroon, Egypt, Ethiopia, Uganda, Zambia and Zimbabwe
- ▶ These companies are active in agriculture, business, health and telecom



# Use of big data for competitive advantage of companies

- ▶ Companies traditionally collect data to which they use to track and forecast the future which has grown exponential and need new processes, mechanism and technology, called Big Data
- ▶ The Economist ‘the world’ s valuable resource is not oil, but data,..)
  - ▶ Global big data and business analytics revenue reached USD\$ 189 billion in 2019
  - ▶ BY 2020 every person expected to generate 1.7 megabytes in a just a second
  - ▶ 14.2 billion connected things in use in 2019
  - ▶ 25 billion connect things by 2025
  - ▶ By 2019, global IoT market be worth USD\$ 1.7 trillion
- ▶ Data has three value chain components - data generation and collection; storage, transmission and security; and analytics. Although now it is much more than that - generates innovation and new products and services





# Big data and analytics

veys among business leaders show that

- ▶ Data analytics scored highly with African and Asia Pacific business leaders - 57 per cent and 61 per cent respectively saying that this is an investment area for them
- ▶ Globally 41 per cent of business leaders said they were significantly increasing spending on data analytics in the next five years to increase their understanding of consumers in emerging market countries
- ▶ In Africa,
  - ▶ Around 85% of African banks surveyed by PwC are using big data to improve their security, whereas 77% are using it to improve their customer service
- ▶ GSMA interviews with Mobile Network Operators in IoT Big data and estimates
- ▶ By 2025 IoT Big data will be worth USD 386 billion
  - ▶ USD\$ 48 billion in cloud and hardware,
  - ▶ USD\$110 billion in Big data and analytics software,
  - ▶ USD\$ 32 billion in the area of platforms,
  - ▶ USD\$78 billion for applications markets, and
  - ▶ USD\$118 billion for professional services in the areas



# Challenges

- ▶ Access to Big Data
- ▶ Privacy, Confidentiality and Cybersecurity
- ▶ Legal frameworks on data protection and privacy
- ▶ Financial challenges
- ▶ Building a critical mass of technical and business skills
- ▶ Infrastructure and services



# Conclusions

Disruptive technology is transforming Africa's economic potential. This includes creating millions of new targetable consumers and giving them unprecedented choice of products and services.

- ▶ It's also fostering the innovation and connectivity that can create new markets and new business models.
- ▶ Indeed, because Africa is not dependent much on long years of legacy technology, it is able to leapfrog more than developed economies.
- ▶ And combined with demographic changes and urbanisation, digital disruption means big opportunities for businesses and investors across the continent. It is therefore important for the continent to seize this opportunity to transform Africa's digital revolution into creating a vibrant digital economy.
- ▶ To realise these opportunities, both the private sector and governments need to be ready to face the challenges of the emerging disruptive technologies that still lie ahead. Among the key priority to this effect include developing the skills, the telecom infrastructure and services, the transport links, the energy supply, etc.
- ▶ Governments have to equally ensure that the reach and benefits of digital technology and the growth it brings are evenly distributed as the trend shows that the upcoming tech hubs across the continent move also away from the capitals and reaching out emerging cities in the continent.



# Recommendations

- ▶ African mainstream businesses need to develop agile and adaptable business model for embracing big data to work in different African markets.
- ▶ Government and other stakeholders need to support upcoming young start-ups to further investment in innovative products to scale-up and move beyond start-up and becoming a leading market player. Start-ups also need to network and use their data and customer relationships to develop new products and services to create new revenue opportunities.
- ▶ African governments need to capture the booming tech hubs to create or change regulations to support growth of entrepreneurialism;
- ▶ African governments need to ensure and make the necessary reform in the education system to generate the necessary people with key technical skills for the big data ecosystem
- ▶ African governments need to adapt to the emerging technologies and the digital disruption environment to improve policy making and deploy recourse more efficiently
- ▶ Countries need to elaborate the interface between big data and the open data to promote innovation and to make the potential of big data much more powerful and useful.



Thank you