



United Nations  
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for Africa

# Expert Group Meeting (EGM) on Fostering African Private sector in the Big Data era

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## Challenges and Potential Solutions for Big Data Implementations in Africa

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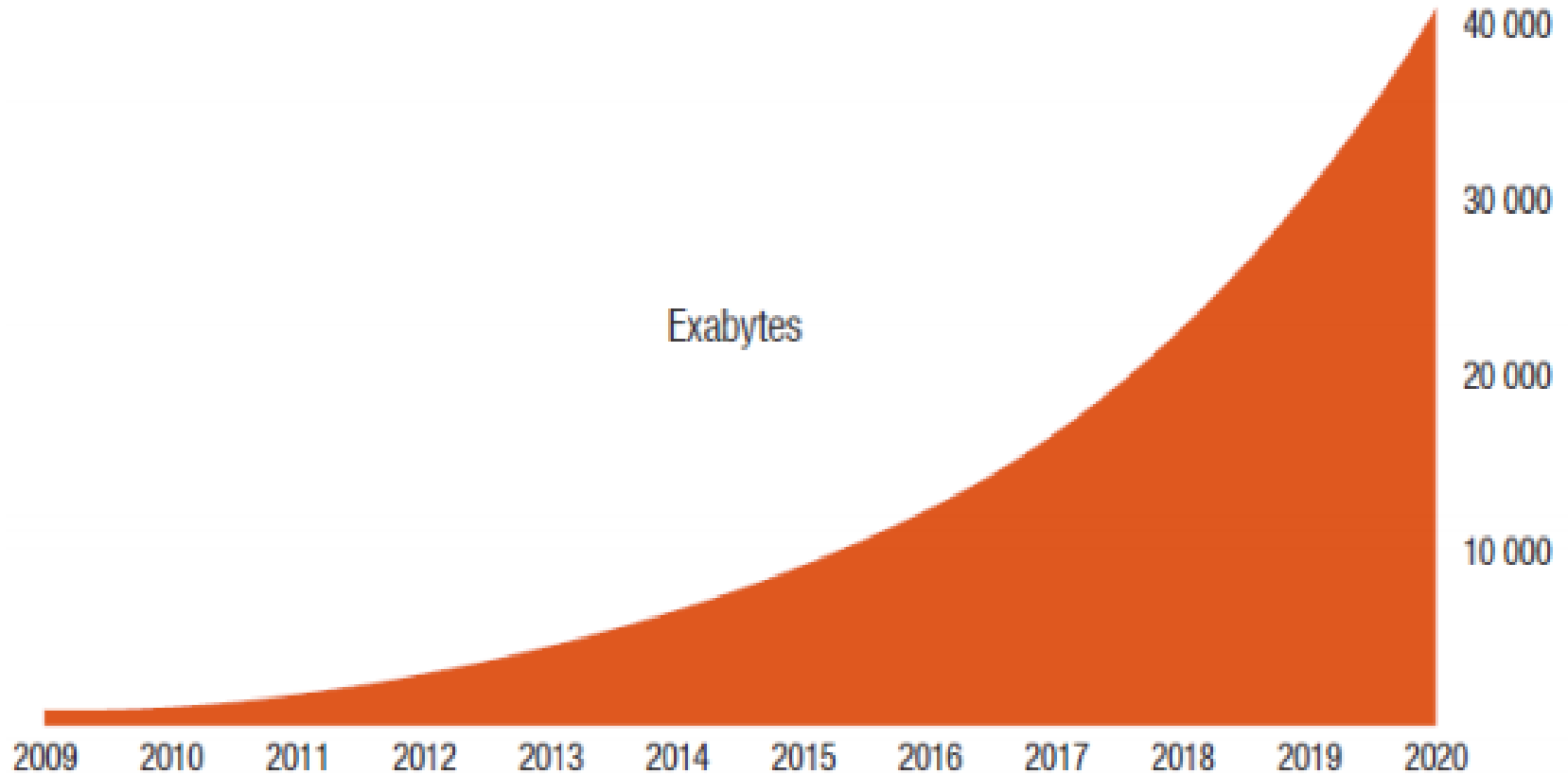
# Sequence of my talk

- ▶ Background information about Big Data
- ▶ Growth of Big Data
- ▶ Definition and conceptual framework of Big Data
- ▶ Application Areas of Big Data
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- ▶ Global data system/big data ecosystem
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- ▶ How Big Data could fuel the African economy?
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# Background Information

- ▶ Over the last decade, there has been a data explosion, caused by the exponential increase of data generation through the progressive digitization of virtually every aspect of everyday life.
- ▶ As a result, more data have been created in the past 2 years than in the entire history of mankind
- ▶ Some aspects of this new reality hinder data use, e.g.
  - their volume,
  - the speed with which they are generated and
  - their diversity.
- ▶ This situation creates the need to change the way data are captured, stored, processed, and analyzed

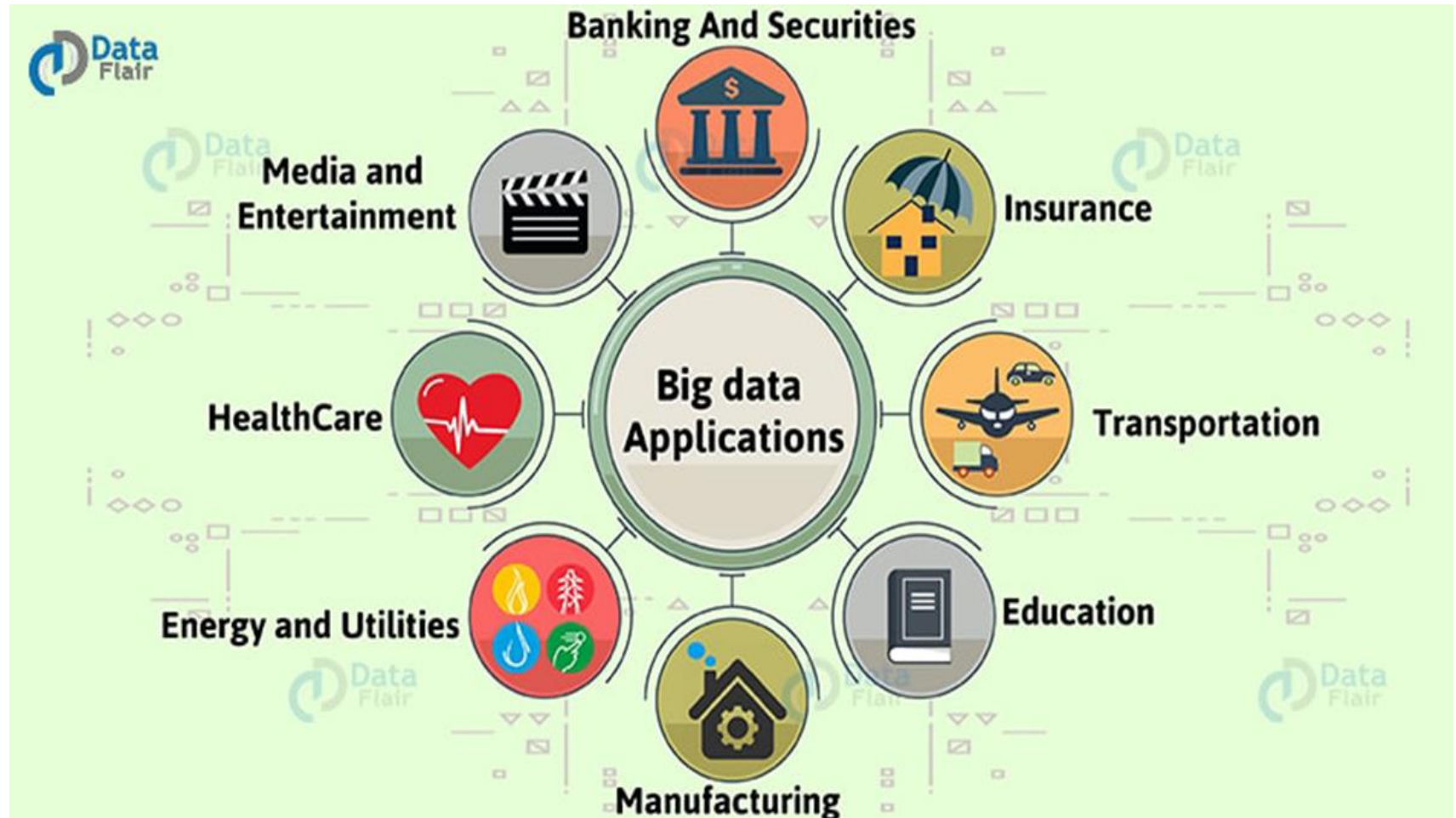
# Growth of Big Data



# Definition & conceptual framework of Big Data

- ▶ Big Data Can be recognizes as the construct of 5 “V”s
  - **'Volume'** refers to the exponential increase in the amount of data that are generated and stored.
  - **'Velocity'** represents the increase in frequency with which data are delivered. BD projects seek to use these data to enable decision making in real time.
  - **'Variety'** describes the different formats data can adopt, such as images, free text, video, and sound, among others.
  - **'Veracity'** refers to the unpredictability of some data, such as weather data, or purchasing decisions of the public.
  - **'Value'** Big data can contain significant economic value.

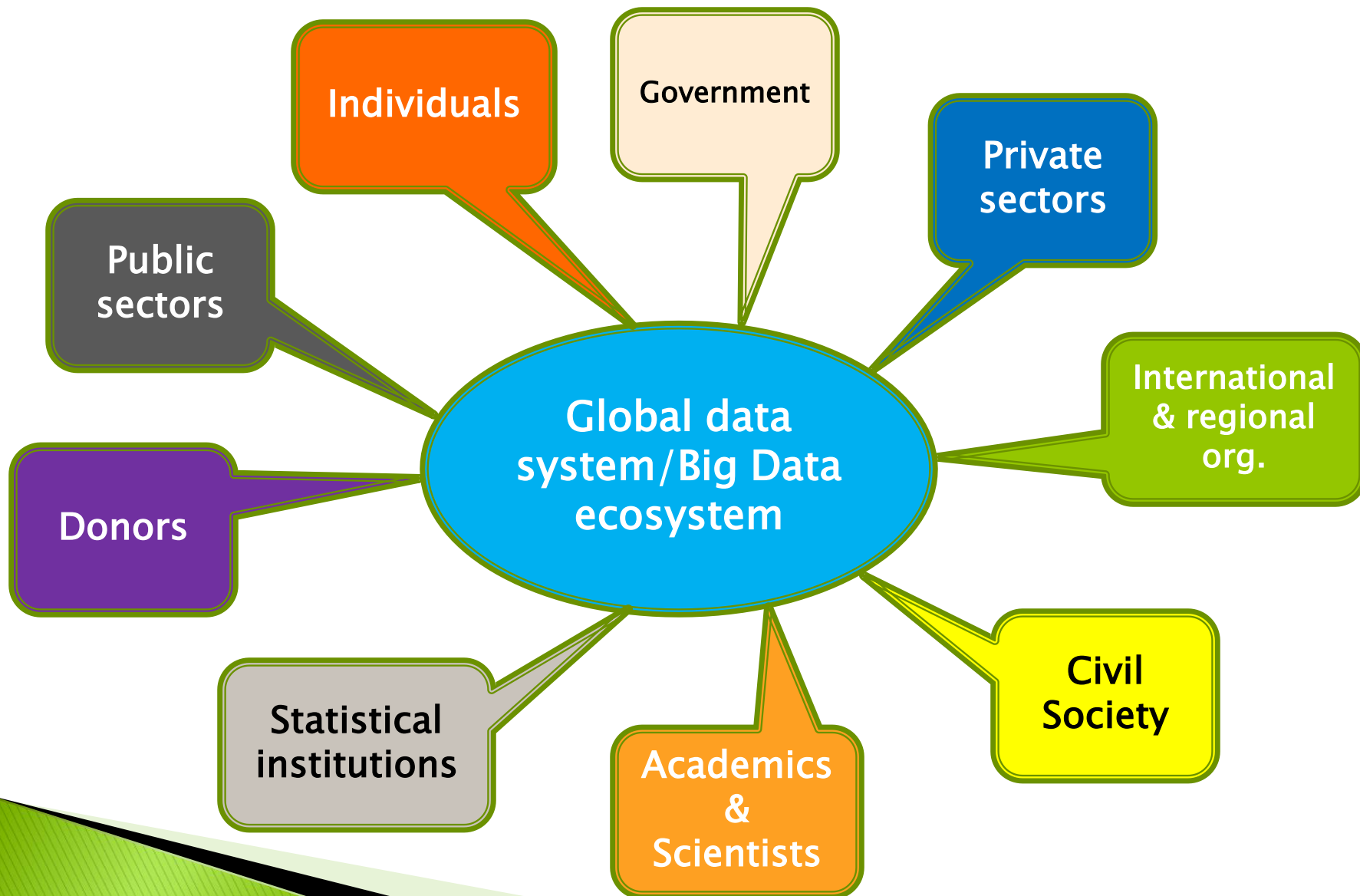
# Application Areas of Big Data



# Primary actors in Big Data era

- ▶ Governments
- ▶ Donors and the philanthropic sector
- ▶ International and regional organizations
- ▶ Statistical systems and institutions
- ▶ Public sectors
- ▶ The private sector
- ▶ Civil society organizations
- ▶ Academics and scientists
- ▶ Individuals

# Global data system/big data ecosystem





# The status of Big Data in Africa

- ▶ In Most African countries Big Data:-
  - are not produced on time,
  - are not frequently produced,
  - are of poor quality,
  - are not accurate,
  - lacks proper management and handling
  - are not shared among sectors
  - are not even given due consideration
- ▶ This makes it difficult to make data driven decisions that will contribute for socio-economic development of the continent.

# Is Africa ready to embrace Big data?

- ▶ Now is the time to build a foundation that ensures that Big Data helps bring better lives in Africa and beyond.
- ▶ With foresight and planning, the technological revolution that Big data brings will be a force to empower a fair and prosperous society.
- ▶ The oft-overlooked continent has much to give and to get from Big Data.
- ▶ The Big data evolution has the potential to bring myriad positive changes in sectors such as
  - health care
  - finance
  - Transportation
  - Logistics
  - Education
  - Energy sector and etc.

# How Big Data could fuel the African economy?

- ▶ Data, and especially Big data of good quality, are essential for
  - national governments and institutions to accurately plan, fund and evaluate development activities.
  - Improved public health
  - Improved Public safety
  - National security
  - Improved Weather prediction
  - Efficient Urban and community planning
  - Forecasting natural disasters
  - Improved agricultural products
  - Development and poverty reduction
  - Good Governance
  - Quality education
  - Conservation and environmental protection
- ▶ In all of the above cases, data provides critical insights into human actions, practices, behaviors, and impacts. This makes closing the data divide affecting underserved and disadvantaged communities a social imperative

# Challenges of Big Data implementation in Africa

## ▶ Data Capture

- Data sets are becoming larger and more difficult to manage using traditional database tools. As a result, organizations are faced with difficulties to capture, store, manage, and analyze data in a timely manner.

## ▶ Infrastructure

- A robust physical infrastructure is a key point for the operation and scalability of a BD project. It is based on a distributed model, where data can be physically stored in different places and integrated through networks

## ▶ Organizational Changes - Workforce

- BD deployments require new IT administration and application developer skill sets. Additionally, the people who possess these skills are a scarce resource given the high market demand

# Challenges of Big Data implementation in Africa cont...

## ▶ **Integration and Interoperability**

- One of the greatest challenges BD faces is to integrate data from many different sources. The use of standards to achieve interoperability between systems is a core requirement to effectively integrate information

## ▶ **Privacy and Security**

- Some characteristics of BD, such as the relative lack of structure and the informal nature of some data, can be a problem if they are sensitive, with potential privacy, safety or legal issues.
- Traditional database management systems support granular security policies that protect data at various levels. The software used in BD projects does not usually have these safety measures

## ▶ **Adoption**

- Data should be managed as a strategic asset within organizations. Existing barriers to the adoption of BD are usually cultural. Many organizations do not implement BD programs because they cannot appreciate the way in which data analysis can enhance their businesses

# Challenges of Big Data implementation in Africa cont...

## ▶ Partnership

- There are no binding guidelines and rules among the private sectors, government offices and institutions to work in collaboration for sharing Big data for common goals

## ▶ Data quality

- Emphasis is not given for data quality in terms of, privacy, content, storage, accuracy and timeliness.

## ▶ Lack of Government support and awareness

- The government has little awareness on the use of Big Data implementation and providing no or little support for some of the startup Big Data projects in Africa.

# Recommendations to curb the implementation challenges

- ▶ Take advantage of the high penetration rates of mobile phones to collect usage-associated data and sensor data for innovative BD projects. (Data Capture issue)
- ▶ Circumvent infrastructure and economic deficits using IaaS and open source software. (Infrastructure Issue)
- ▶ Increase the number of data scientists trained. Make partnerships with nonprofit organizations. (Work force issue)
- ▶ Advance in the creation and adoption of digital agendas. (Integration and interoperability issue)
- ▶ Institute policies and regulatory frameworks to ensure the privacy and security of sensitive data. (Privacy and security issue)
- ▶ Implement strategic partnerships with private and public institutions with expertise in BD tools and techniques. (Adoption issue)
- ▶ encourage institutions and private sectors to produce and share accurate, unbiased Big data. (Partnership issue)
- ▶ Prioritize the core attributes of data building blocks: accuracy, timeliness, relevance and availability. To achieve this, build quality control mechanism, open Big data, accountability for improving data quality. (Data Quality issue)

# “Is Data the new oil” ?

- ▶ Unlike oil, data’s value is specific. If I inherit a tanker full of crude oil, I can sell it anywhere. If Amazon sends me its last five years of data, that’s useless to me. Amazon’s data is worth billions to Amazon and Africa’s data is worth billions to Africans.
- ▶ Rightly employed it can be used to improve infrastructure, crop yields and livelihoods the continent over.

Source:–Ethiopian Airlines bulletin Nov–Dec/2019  
Edition Page 24–25



# Conclusion

- ▶ The big data evolution is about arming society with useful, life improving information and insight—that means the enterprises, private sectors, NGOs, innovators, families and individuals who have always been the engine of our continent greatness
- ▶ “Africans should be paranoid right now,” warns Alex Liu, Chairman of consulting firm AT Kearney. “You have to create, collect and protect your data or someone else will. With the right framework, innovations in the food, health, public and service sectors will offer a wave of entrepreneurship and job creation. **But we need to start now, no point in delay!!!!!!!** Source:–Ethiopian Airlines bulletin Nov–Dec/2019 Edition Page 24–25

*Thank You*