



12th NCS International Conference
*Information Technology for Inclusive
Development.*

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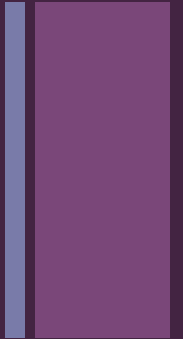
**nigeria
computer
society**

BIG DATA & ANALYTICS

OPPORTUNITIES AND CHALLENGES



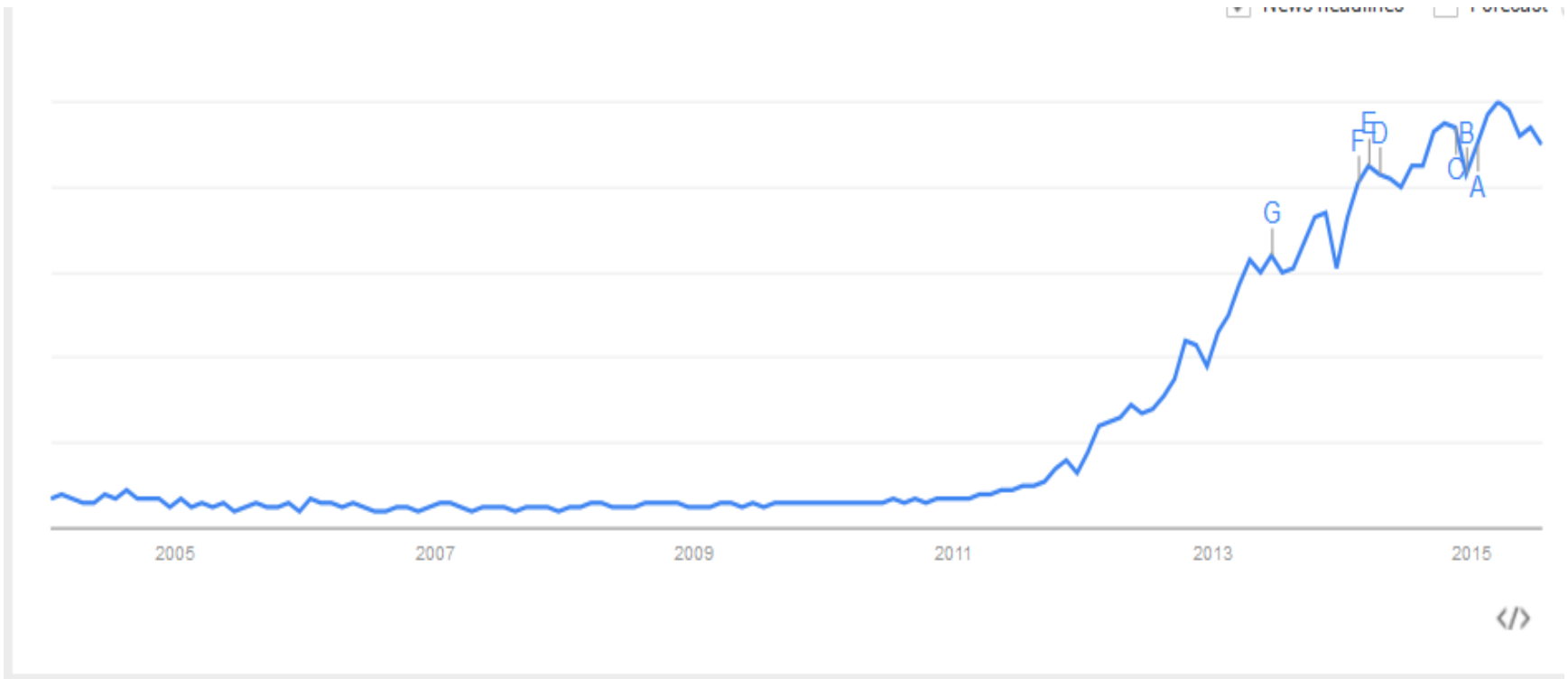
This talk



- Explains the basics of Big Data
- Introduces Big Data Analytics and its Potential Opportunity for Businesses and Government
- Identifies challenges for Big Data Uptake in Nigeria and suggests solutions from global best practices



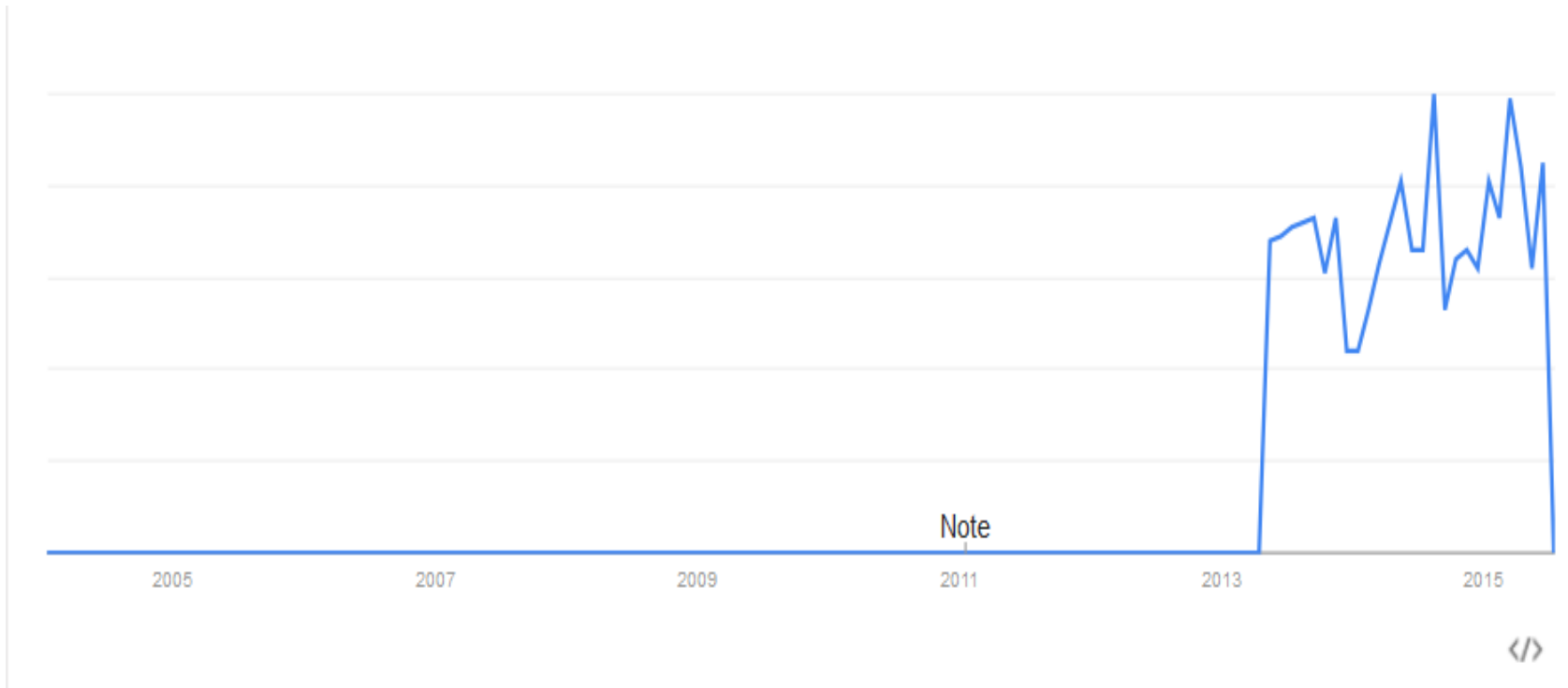
Big Data is trending...globally



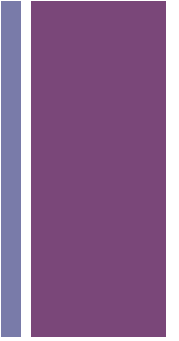
Big Data Interest over time. Web Search. Worldwide, 2004 – present
Source: Google Trends



Big Data is trending...in Nigeria



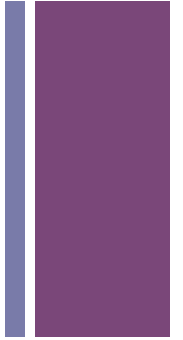
Big Data Interest over time. Web Search. Nigeria, 2004 – present
Source: Google Trends



Is it just another IT buzzword...?



Big Data = Big Impact...



**“The future belongs to the companies,
and people that turn data into
products”**

O'Reilly Media



Big Data = Big Impact...

“Data is the new ‘Oil’ of the 21st Century with potential to spur innovation and socio-economic development in many sectors”

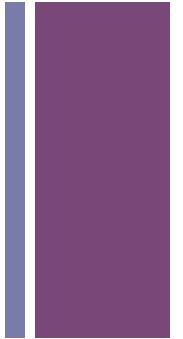
Source: World Economic Forum



Big Data = Big Impact...

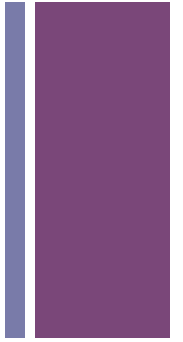
“By 2020, the market size of the **third IT platform** (big data, cloud computing, mobile Internet and social business) will reach US \$5.3 trillion. And from 2013-2020, 90% of the growth in IT industry will be driven by the third IT platform”

Source: International Data Corporation (IDC)





Big Data = Big Impact...



“Big Data is a critical support and pillar of **second economy** (i.e. economic activities running on processor, connectors, sensors, and executors). Because of Big Data, **competence** under the second economy will no longer be that of **labour productivity** but **knowledge productivity**”

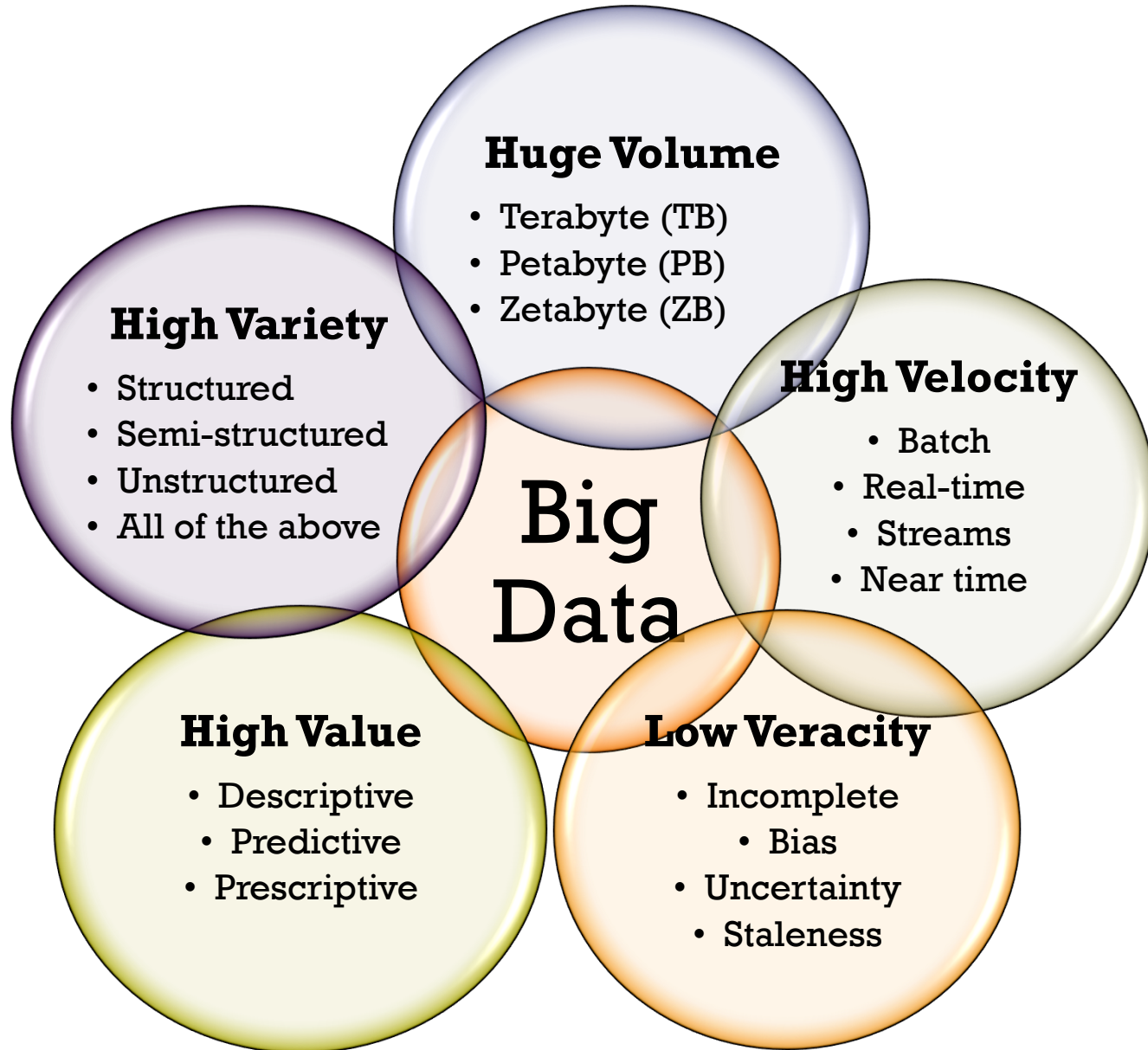
Source: American Economist, W.B Arthur in 2011



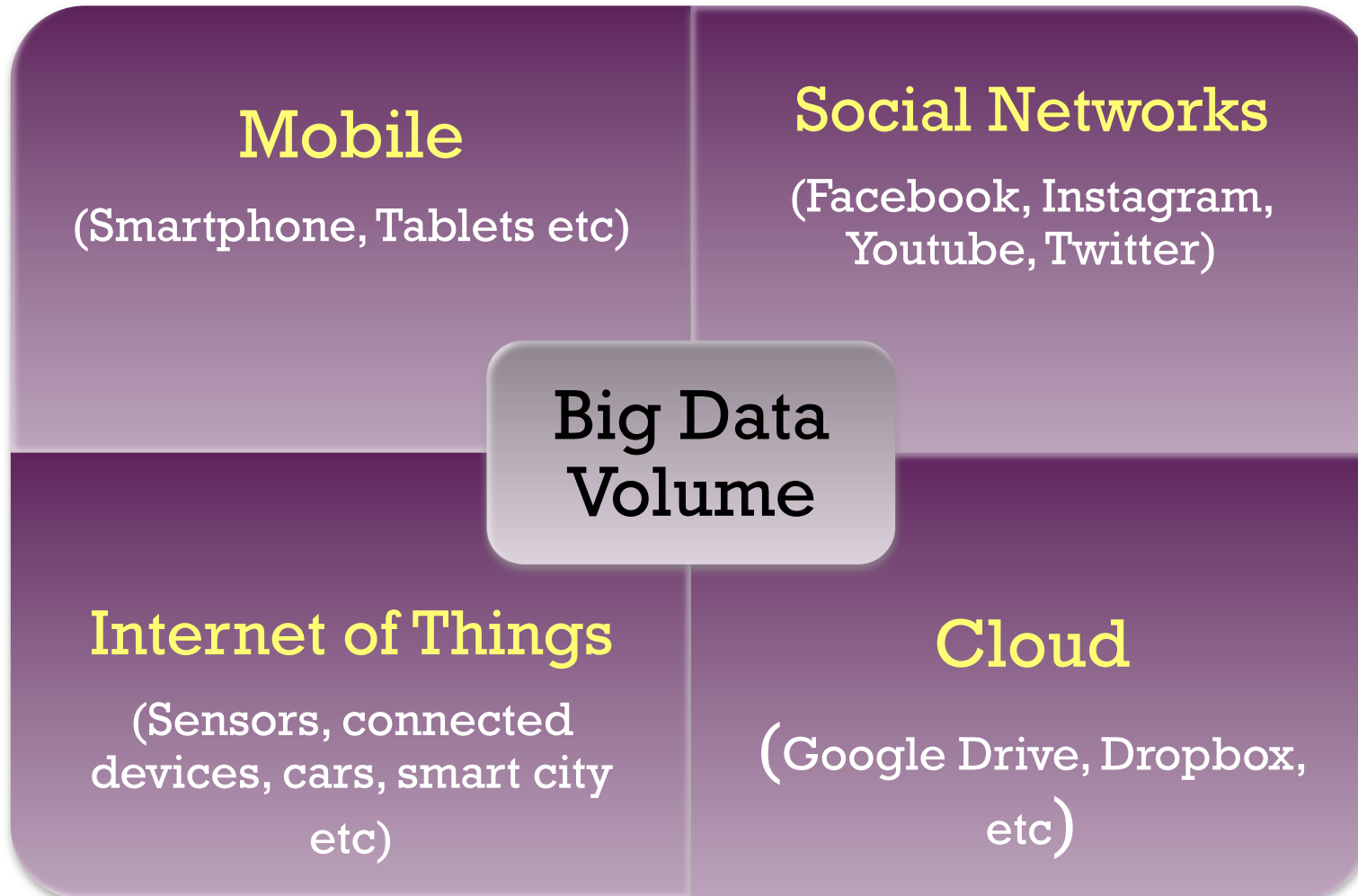
What is Big Data?

Extremely large and varied datasets that may be analyzed to reveal patterns, trends, and associations; they're often too large to store, process and analyze with traditional storage and computing methods.

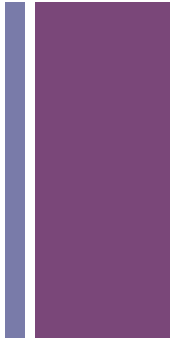
+ 5Vs of Big Data Challenge



+ Key Technology Trends & Drivers of Big Data



+ Main Sources of Big Data Volume



HUMAN-GENERATED

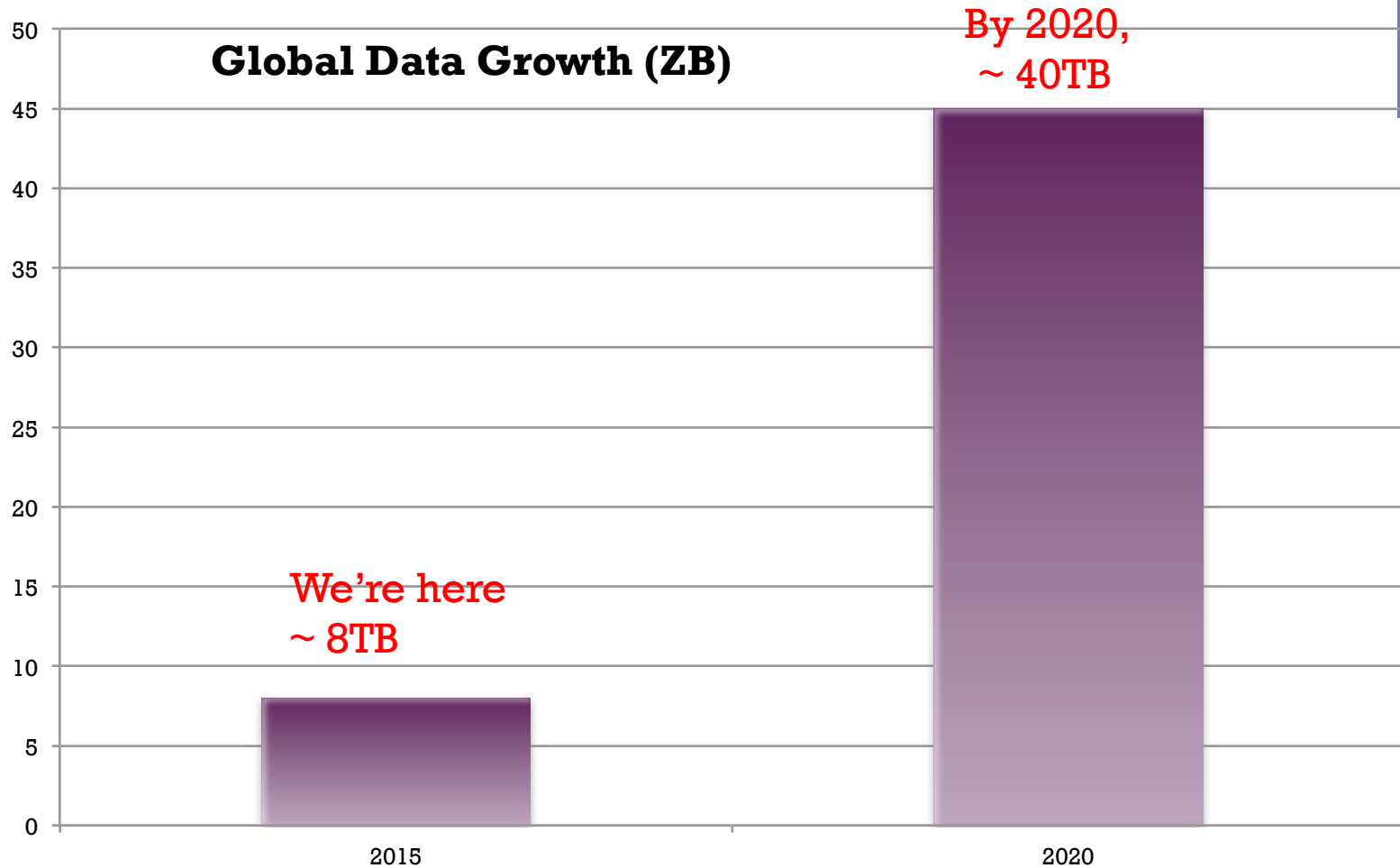
- **Online Behaviours**
(orders, transactions, payment history, usage history)
- **Online attitude**
(opinions, preferences, interests, needs and desires, social media posts)
- **Interaction Data**
(Clickstreams, email/chat)

SENSORS-GENERATED

- **What we wear** (watch, wristband, eyeglass, shoes, cloth etc)
- **Home Appliances**
(Fridge, Cooker, Entertainment, etc)
- **Environment** (Weather, traffic, etc)

Others: Applications (web/mobile), Systems and Instruments (e.g. Airplane)

+ Data Rate is growing exponentially



About 5X yearly

Source: Oracle, 2012

+ Variety of Data

Structured, Semi-Structured and Unstructured

The Unstructured Data Explosion

- Growing 100X every 10 years
- Requires a new approach



Image credit:
datanami.com

Over 80% of World's Data are currently Unstructured

+ Velocity of Data

Data are generated at a faster rate

Every 60 seconds

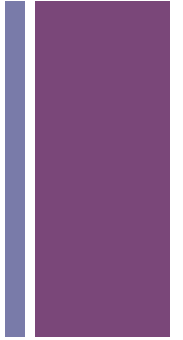
-  **204 million+** emails sent
-  **100,000+** tweets
-  **2 million+** Google searches
-  **\$275,000** spent online shopping
-  **35,000** brand "Likes" on Facebook
-  **38,000** new Tumblr blog posts
-  **48** hours new video on YouTube
-  **2,000** check-ins on Four Square

Sourcet:
E-week.com

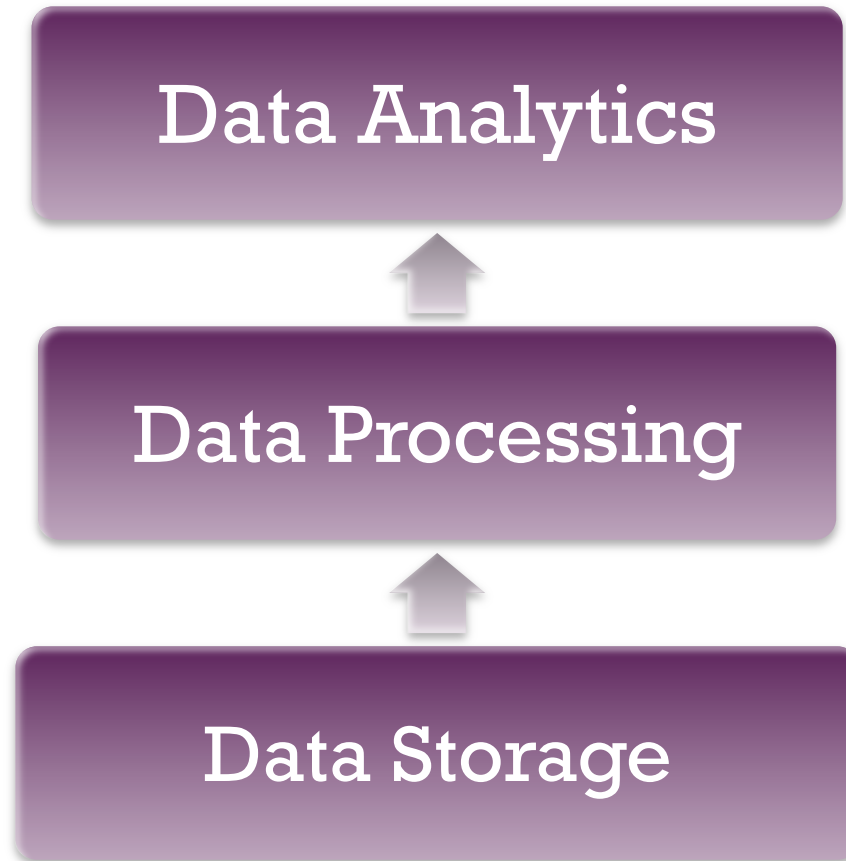
+ Veracity of Data

Data Quality and Integrity issues

- Data Inconsistency
- Data Incompleteness
- Freshness / Timeliness of data
- Data uncertainty
- Error
- Provenance



+ Big Data Architecture



I will focus on DATA ANALYTICS in this session

+ Analytics is like trying to find
“needle in the Haystacks” of Data



+ Many Organizations are **Data** Rich
but **Insight** Poor



Image credit: dmnews.com



Defining Big Data Analytics



Big Data Analytics involves deriving **valuable** and **actionable insights** from the “sea of data” generated or collected from various data sources



3 Types of Big Data Analytics



Descriptive

Predictive

Prescriptive

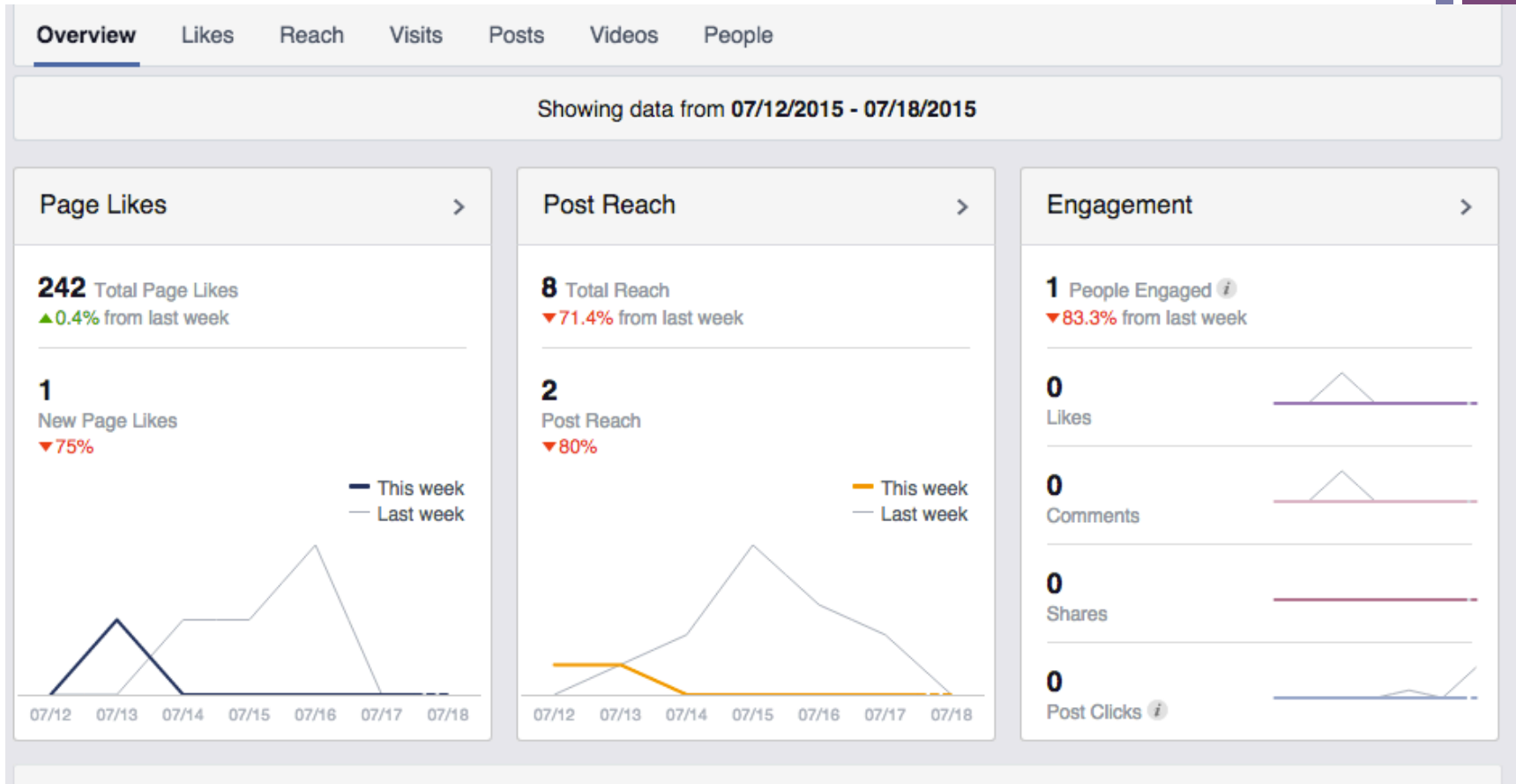


Descriptive Analytics (DA)



- Allows you to condense big data into smaller, more useful nuggets of information
- The purpose of DA is **to summarize what happened**
- 80% of Business Analytics tasks are descriptive in nature.
- Example (Social Network Data Analytics) - *number of posts, mentions, fans, followers, views, likes, +1s, check-ins, pins, etc*
- There are literally thousands of these **metrics** but they are all just **event counters**.

+ Example: Facebook Insight for Pages of Organizations





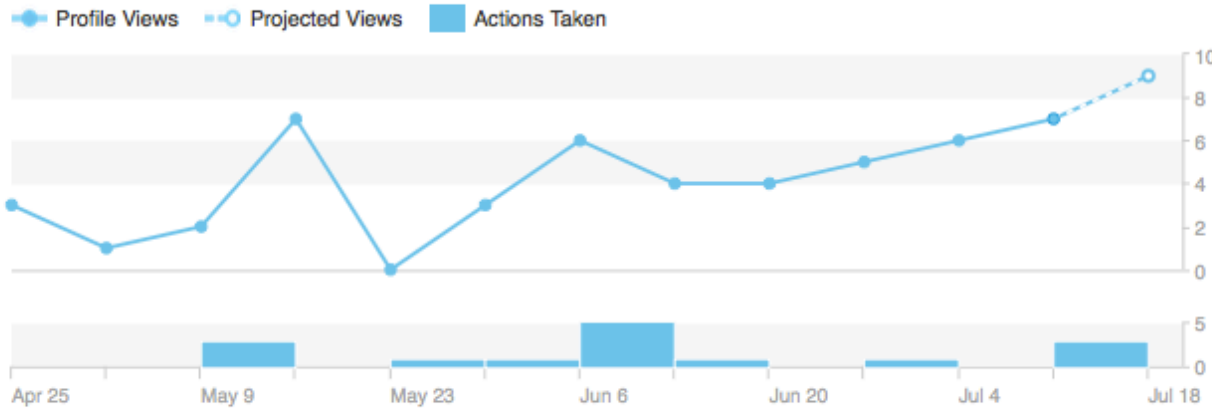
Example: LinkedIn Profile Views



49 Profile views
Last 90 days

1 Viewer who works at King Abdullah University of Science and Technology

2 Viewers with the title Project Manager



Jul 5 – Jul 11

7 Profile views
Up 17% from the previous week ▲

0 Actions taken
Down 100% from the previous week ▼

Getting more profile views can help you get found for the right opportunity.

[Get more profile views ▶](#)



Predictive Analytics

- Predictive Analytics utilizes a variety of statistical, modeling, data mining, and machine learning techniques to **study recent and historical data**, and **make predictions about the future**
- Predictive analytics can only **forecast what might happen** in the future (probabilistic in nature)
- *Example:* Customer Churn or Risk Analysis, e.g **Will X customer leave or will Y customer pay off a loan?**



Prescriptive Analytics

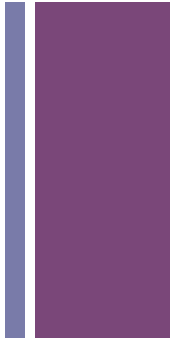


- Goes beyond descriptive and predictive models by **recommending one or more courses of action -- and showing the likely outcome of each decision**
- E.g. **prescriptive will tell us what type of offer to sent to which churn candidate to promote retention or what loans to approve to maintain an acceptable level of risk.**

+ Is Big Data Analytics NEW?

How is it different from traditional BI, Data Mining, Statistical Analysis etc

- **Access to New Data Sources:**
 - User data across many applications and contexts now available allowing richer and broader insights.
- **Unlock New Values:**
 - Traditional Analytics have mainly focused on structured data, with larger proportions of valuable unstructured data ignored
- **Shaping the future:**
 - With access to large datasets, we can better forecast or predict what might happen in the future and make decision based on accurate “actionable intelligence”



+ Big Data Analytics Applications

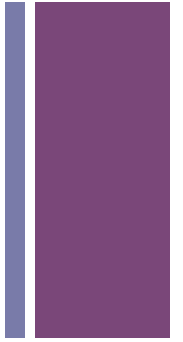


- **Search and Recommendation**
 - Tailoring product/advertisement to the needs and interests of user e.g Amazon, Netflix, etc
- **Customer Churn Analytics**
 - Predicting customers that are likely to defect and offering them incentives to stay e.g Mobile carriers, Banks etc
- **Sentiment Analysis**
 - Sentiment is the attitude, opinion or feeling toward something, such as a person, organization, product or location.
- **Fraud & Anomaly Detection**
 - Identification of items, events or observations, which do not conform to an expected pattern, or other items in a dataset e.g financial fraud,
- **Social Graph Analysis**
 - the mapping and measuring of relationships and flows between people, groups, organizations, computers, URLs, and other connected information/knowledge entities.



**+ Challenges for
Big Data Uptake
in Nigeria**

+ (1): Privacy and Security



- **We need to know:**
 - Who collects data from user?
 - What they are doing with the data? Will the data be use to discriminate or deny access by user to services?
 - What risk does the usage poses to the user?
 - Where is the data stored? Local or online?
 - Who has access to it and for what purpose?
 - Where would the data be processed?
- **Nigeria need data privacy laws and a “Privacy Commission” to provide oversight on privacy implications of how personal data is collected and used by government and businesses**
- **Example: OPC Canada formulated PIPEDA**



(2): Shortage of Skilled Personnel



- Having large and varied dataset is useless without skilled personnel to harness/generate value from it.
- Currently, there is a large shortage of skilled data scientists globally (estimated at 140,000 in next 5yrs in US)
- Many Universities in North America are now offering **specialized Masters degree** in Big Data Analytics.
- Companies (like IBM, Google) are also **funding training and research centers** on Big Data Analytics
- Also, we need **early education and training** in Computer Programming and Maths/Statistics

+ (3): Lack of a National Strategy/ Initiative on Big Data

- Most of the developed world – US, Canada, Britain, Australia, France, Japan has a national agenda and initiatives on Big Data.
- In 2012, US launched **Big Data Research and Development initiative** with an investment of more than US\$ 200M
- The initiative involves 6 agencies – DoD, DARPA, DoE, NIH, NSF, USGS
- **Focus on:** *Health and wellness, environment and sustainability, emergency response and disaster resiliency, manufacturing, robotics and smart systems, secure cyberspace, transportation and energy, education, and workforce development*



Other Global Big Data Initiatives



- In Jan 2013, the UK govt. announce a BIG DATA plan with initial funding of 189M pounds
- In Feb 2013, French govt. published the “Digital Roadmap” which invest 11.5M euros in the development of seven future projects including BIG DATA
- In August 2013, Australia announced Australian National Big Data Strategy
- In 2012, Japan announced their Big Data Strategy named “The Integrated ICT strategy for 2020” which develop framework for open data



Other Global Big Data Initiatives (2)



- **The European Union (EU) announced “Horizon 2020” as their next framework program (EU-FP) for research and innovation with 120M euros on Big Data related industrial research and applications**



(4): Data Inaccessibility

- Data can generate value and spur innovation in many sectors of our nation's economy – Agric, Business, Transportation, Climate, Finance, Education, Energy, Health, Local Govt Admin.
- To get these values, public datasets must be **AVAILABLE** and **ACCESSIBLE**.
- Goal of Open Data Initiative is to encourage innovation by providing access to public data
- Example: **DATA.GOV** in US; **DATA.GOV.UK** in UK; and **OPEN.CANADA.CA** in Canada



Example of Open Data on DATA.GOV



Agriculture



Business



Climate



Consumer



Ecosystems



Education



Energy



Finance



Health



Local
Government



Manufacturing



Ocean



Public Safety



Science &
Research

Image credit: data.gov

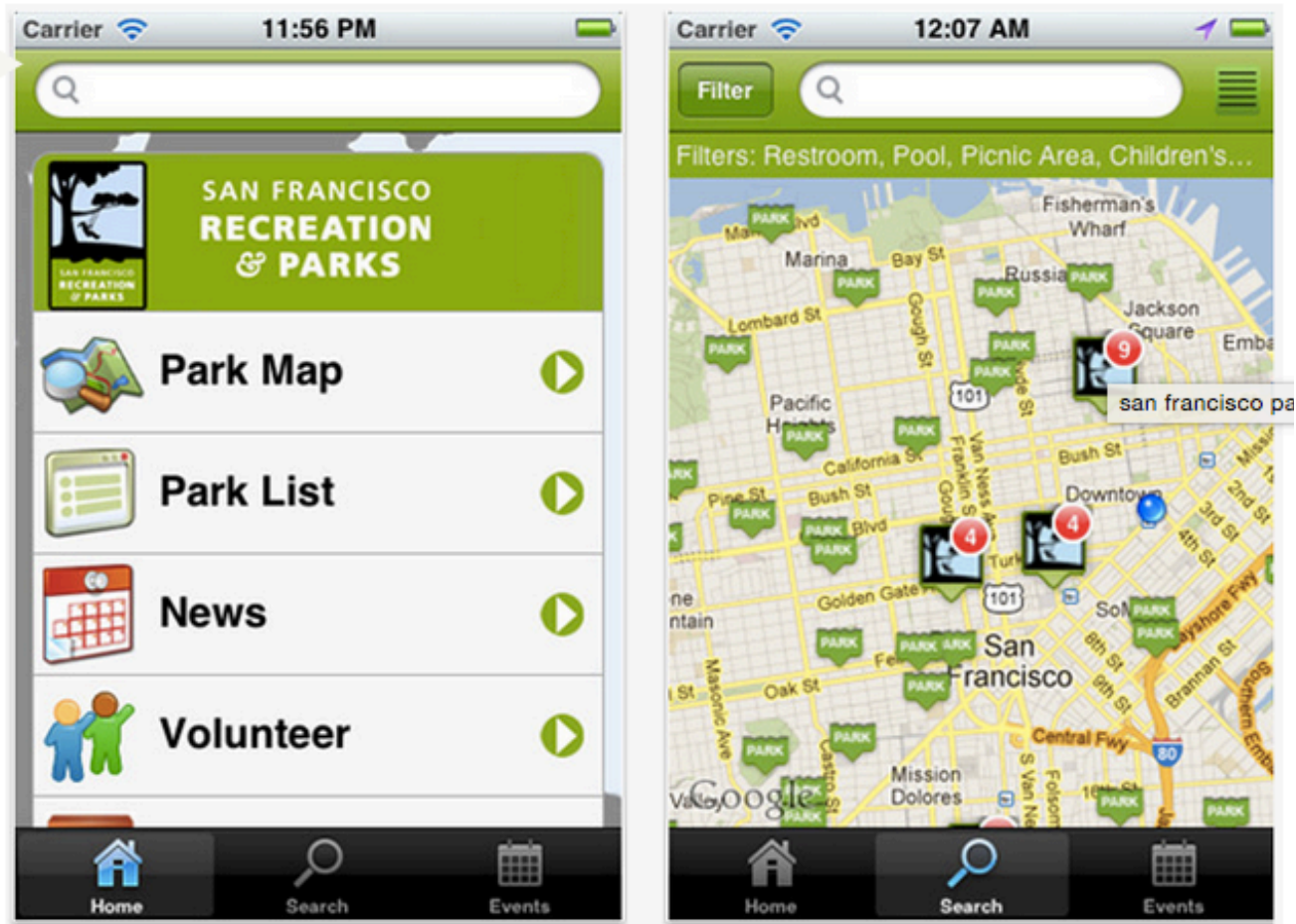


DATA is key to Change!



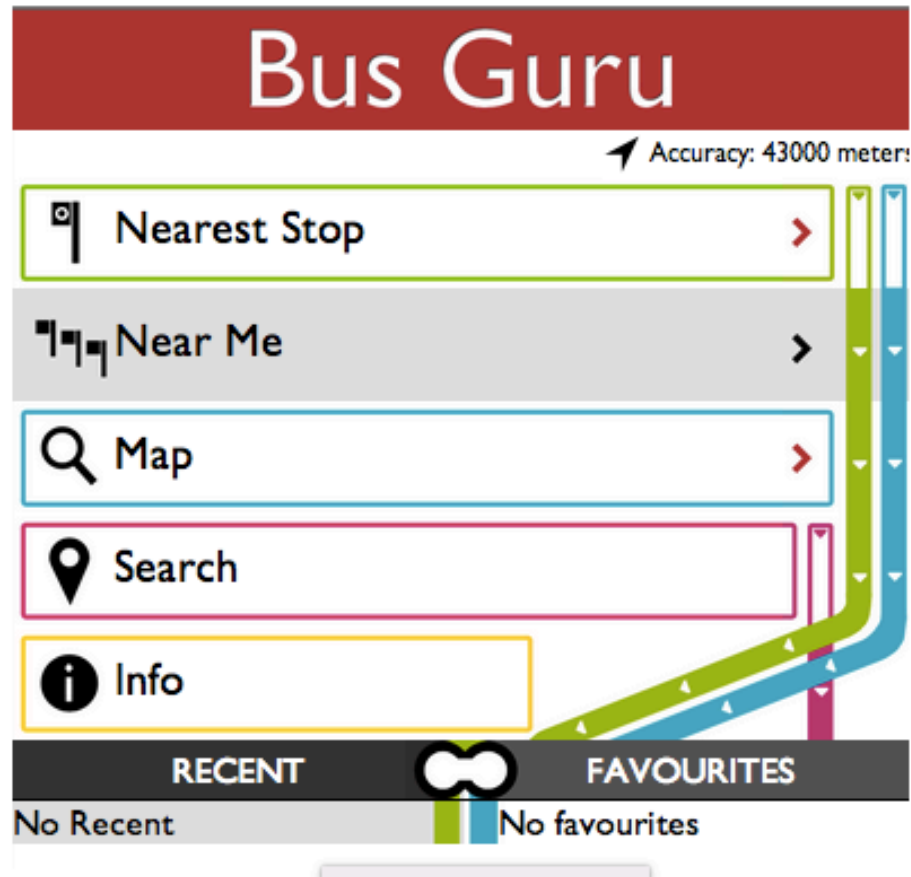
- The change and development we yearn for in Nigeria is data-dependent.
- We need Open access to data across Government ministries and parastatals
- Innovations and changes are “BOTTOM-UP” rather than “TOP-BOTTOM”
- In North America, we have many mobile/web apps developed by individuals that inform citizens about “road conditions”, “traffic congestions”, “where to find restaurants”, “hotels”, “parks”, “flight status”

+ Example 1: San-Francisco Recreations and Parks



Helps people find and navigate thousands of parks, playgrounds, museums, recreation centers, gardens, public restrooms and other points of interest and facilities that are maintained by the city of San Francisco

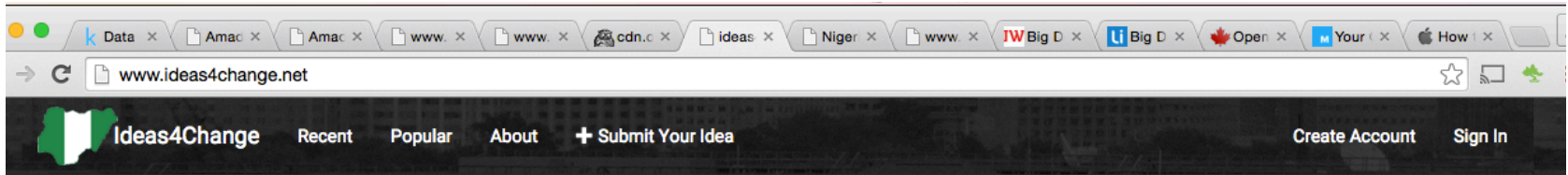
+ Example 2: Bus Guru, London



Bus Guru is an iOS app that pulls in data from Transport for London, giving commuters real-time bus options, journey times and estimated time of arrival at a given station.



IDEAS4CHANGE.ORG



Welcome to Ideas4Change - Nigeria

Nigerians, home and abroad, have earnestly yearned for genuine CHANGE in the way the country's affairs are run. On March 28 2015, Nigerians were given the opportunity to choose between the incumbent PDP government or embrace change largely taunted by the APC.

The citizens voted for change and the change has come. But, as we all know, change starts from the mind of great thinking people and a pool of great ideas is usually better than a single great idea, particularly for scenarios involving governance in a system such as Nigeria.

Latest Change Ideas

Scrap Govt Sponsoring Pilgrimage

Pilgrimage to whatever country the people want to go to should be a personal voyage and should not be paid for using the Government funds. Even in this current austerity looming around the country, it is uttermost wickedness to allocate over NGN70B for pilgrimage when the same government is failing in its basic responsibility such as paying workers' salary. This is such a devilish act

★ 0 · [Corruption](#) · Added on: Jul 15 06:47 by [Honorable](#) · [Idea's details](#) · Followed: 0

Revamping of the agric sector using the nysc

The NYSC should be restructured to be 2 years. One year will be agriculture empowerment for corpors. Six month will be full entrepreneurship training while the other six mkntha will be teaching in schools. After the nysc, those that want to statt businesses will be sent to thw bank of industry for a aoft loan of 500k payable over a 5year period.

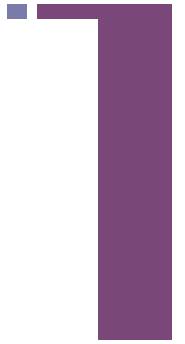
★ 0 · [Agriculture](#) · Added on: Jun 11 17:49 by [Boladale](#) · [Idea's details](#) · Followed: 0

Maritime Unemployment Crisis

Ideas by Category

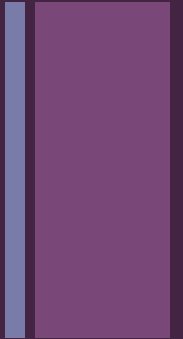
Agriculture	1
Corruption	4
Education	0
Electricity	1
Import and Export	0
Information Technology (IT)	0
Oil and Gas	0
Police Reform	0
Security - Boko Haram	0
Transportation	0
Unemployment	1

About Ideas4Change



Let's Turn-On Our
Own Tap of
Innovation and
socio-economic
development
through **BIG
DATA**





THANK YOU FOR LISTENING

Questions???

CONTACT ME

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