LEVERAGING BIG DATA FOR FINANCIAL INCLUSION

EMEKA OKOYE, SEMANTIC WEB ARCHITECT
PROFILE OF EMEKA OKOYE

- Semantic Web Architect at CYMANTIKS Nigeria Ltd
- Developed solutions using computational linguistics and cognitive technology to create value from data for organizations
- 20+ years experience (Consulting & Software Engineering)
- Built first Internet Banking and eCommerce applications in the 90s
- My experience has embraced a breadth of technologies culminating today in the Enterprise, Mobile and Semantic Web world
- Listed among the top 20 most influential Technology people in Africa (2013) by South Africa IT News blog
AGENDA

- Situation Analysis
- Opportunities
- Data
- Strategies
- Goals
- Conclusion
SITUATION ANALYSIS

HOW TECHNOLOGY IS CHANGING THE LANDSCAPE
SITUATION REALITY

- Explosion of mobile technology
- Skyrocketing mobile phone penetration
- Escalating processing power of phones
- Millions of consumers who lacked financial services
STATISTICS

- Population (est.): 180m
- Mobile Subscriptions (est.): 150m
- Internet Users (est.): 97.2m
- Bank Accounts (est.): 30m
- Total Employees: 74m (NBS, 2015)
- Top Sector by Employee%: Agriculture (30.5); Retail, Maintenance (24.9)
- MSME: 37m
- MSME Employees: 60m
Nigeria is Africa's largest mobile market.
The market’s continued growth, spurred by the low cost of deployment and easy-to-use technology, presents a huge opportunity to improve access to financial services across the country, with women entrepreneurs at the forefront.
FINANCIAL REALITY

- 47% of Nigerians are not in the banking system (Ericsson, 2016)
- Coverage of financial services in Nigeria is poor, with those at the Bottom of Pyramid (BoP) largely excluded
- Financial inclusion increases the resilience of BoP to economic shocks and helps boost Micro Small and Medium Enterprises
- Access to financial services is essential to our development efforts
- Developing products for the low-income mass market has been major challenge for financial institutions
- Nigeria has an ambitious target of including 70% of the population in formal financial services by 2020
HOW DID WE GET HERE

- High costs of serving consumers via traditional banking models
- Relatively small transaction values involved
- Difficulties of knowing and assessing many of these consumers
- Cheap and affordable banking services
- Financial institutions presently lack information about potential customers, which products address their needs and how to provide access to those products.
- For communities that rely on agriculture – the weather can dictate when they can repay loans (risk++)
OPPORTUNITIES

DIGITAL REVOLUTION IS RAPIDLY CHANGING THE DYNAMICS
FINANCIAL INCLUSION OPPORTUNITY

- We value financial inclusion because we believe it will increase the well-being, dignity and freedom of poor people and people living in remote areas, who have never had access to savings, insurance, credit and payment services.

- The high mobile phone penetration across the nation offers Financial Inclusion a huge opportunity to offer the unbanked with a “customer-centric” approach.

- Financial Inclusion will allow low and middle income households to better capture opportunities and manage economic shocks.

- Financial Institutions should not make misrepresentations to consumers, or charge exploitative or hidden rates or fees.
And every time these individuals make a phone call, send a text, browse the Internet, engage social media, or top up their prepaid cards, they deepen the digital footprints they are leaving behind.

These digital footprints are helping to spark a new kind of revolution in lending.

In the last few years, a cluster of fast-emerging and innovative firms, FINTECHs, has begun to use highly predictive technologies and algorithms to interrogate and generate insights from these footprints.
DIGITAL REVOLUTION IS RAPIDLY CHANGING THE DYNAMICS

- Together, these consumer, data, and digital revolution trends are helping to change the landscape of inclusion and reach, offering the promise that billions of previously “invisible” consumers can be “visible” for the first time.

- At the intersection of the explosion of digital data, the rapid development of analytics capable of mining this data for meaningful insight, and the aspiring middle-class consumers who are becoming digital and discoverable for the first time are new opportunities and new consumer value propositions.
DATA

THE HUMAN RACE IS STARING AT A MASSIVE DATA EXPLOSION
WHAT IS BIG DATA

- “Classic” definition: Data that is far too LARGE, COMPLEX, and DYNAMIC for any conventional data tools to capture store, manage & analyze.

- While “size” of data is traditionally the hallmark of big data, the term is poor, and may be better rooted in an understanding that Big Data is about capacity to SEARCH, AGGREGATE and CROSS-REFERENCE data sets.

- Technological: computational power and algorithmic accuracy to gather, analyze & link
BUSINESS INTELLIGENCE (BI) VS BIG DATA

- BI helps find answers to questions you know
- Big Data helps you find the questions you don’t know you want to ask
- Big Data usage leads to:
  - increase in productivity
  - more profitable than competitors
DATA PROBLEM?

- Data exists.....fact:
  - Problem is mining it effectively
  - Skills to analyze
  - Understanding what does it mean for your business
DATA IS A RAW MATERIAL OF BUSINESS

- Better decisions... Evidence based
- Better performance through understanding the following: product, sales and service
  - New clients
  - New services & better customer experience
  - LEAVING NO ONE BEHIND - FINANCIAL INCLUSION
On average, organizations use only a fraction of the data they collect and store. The challenge is to decode such capacious raw data sets into strategic and effective insights, improving business prospects.

Data analytics helps industries and organizations to make more-informed business decisions, using specialized systems and software.
Disconnected Silos

DATA SILOS
TYPES OF DATA

- **Structured Data**: Client Data collected in the course of financial service provision usually stored in a DBMS e.g. Personal info or KYC, transactional data, assets, liabilities, income

- **Semi-Structured Data**: Digital footprints people leave as they transact or move in the digital world e.g. Mobile phone records, social media, blog comments, purchases

- **Unstructured Data**: Open (Public, Govt) Data in aggregate form provided publicly usually by governments e.g. weather, economic, satellite, social
WHAT IS BIG DATA

- It refers to data captured in very large quantities, very rapidly, from numerous sources, where that data is of sufficient quality to be useful.
- The collected data is analysed, using increasingly sophisticated algorithms, in the hope of revealing new correlations and insights.
WHAT IS BIG DATA

40 ZETTABYTES
6 BILLION PEOPLE
2.5 QUINTILLION BYTES
WORLD POPULATION: 7 BILLION

Volume
SCALE OF DATA

6 BILLION PEOPLE
have cell phones
6 BILLION
have cell phones

It’s estimated that
2.5 QUINTILLION BYTES
are created each day

2020

The
FOUR V’s
of Big Data

400 ZEBIBYTES
100 TERABYTES
100 SENSORS

Modern cars have close to
100 SENSORS
that monitor items such as
tyre pressure and fuel level

Velocity
ANALYSIS OF STREAMING DATA

Most companies in the
U.S. have at least
100 TERABYTES
of data stored

Variety
DIFFERENT FORMS OF DATA

30 BILLION
PIECES OF CONTENT
are shared on Facebook every month

400 MILLION TWEETS
are sent per day by about 200
million monthly active users

As of 2011, the global size of
data in healthcare was estimated to be
150 EXABYTES
101 BILLION GIGABYTES

1 IN 3 BUSINESS
LEADERS
don’t trust the information
they use to make decisions

By 2015
4.4 MILLION IT JOBS
will be created around
to support big data
with 1.9 million in the United States

Veracity
UNCERTAINTY OF DATA

In one survey, 27% of
respondents thought
27% OF
RESPONDENTS

Poor data quality costs the US
$3.1 TRILLION A YEAR

By 2014, it’s anticipated
there will be
420 MILLION WEARABLE, WIRELESS
HEALTH MONITORS

4 BILLION
HOURS OF VIDEO
are watched on
YouTube each month

The New York Stock Exchange
captures
1 TB OF TRADE
INFORMATION
during each trading session

Depending on the industry and organization, big data encompasses information from multiple
internal and external sources such as transactions,
video, media, enterprise content, sensors and
mobile devices. Companies can leverage data to
adapt their products and services to better meet
customer needs, optimize operations and
infrastructures, and find new sources of revenue.

Volume, Velocity, Variety and Veracity

Sources: McKinsey Global Institute, Twitter, Github, ServiceNow, EMC, SAS, IBM, MPE, GIC, SAS
Big Data, Machine Learning and Analytics can be used to create opportunities to improve financial inclusion and reduce the population of the unbanked by helping financial service providers to offer affordable financial services.

Having a deeper understanding of what financial products underbanked consumers and small businesses need and want. It’s about the data.

Consumers should also be protected from harms that result from data practices.
360 DEGREES ENTITY VIEW
Big Data is opening doors for Financial Institutions to enter the microfinance sector. The new competition can have a positive impact on MFIs as it pushes them to innovate around “alternative” credit scoring models and to develop mobile-based savings and loan products that can be easily accessed by clients.

Big Data can offer big benefits to consumers, with more convenient and affordable financial services that better meet their needs. But there are also several risks that arise from the increased use of big data.
STRATEGIES

CHARACTER IS MORE IMPORTANT IN GAUGING ONE'S CREDITWORTHINESS THAN MONEY OR PROPERTY ~ J.P MORGAN
OBJECTIVES

- Extend credit to consumers who previously had to rely on expensive and sometimes exploitative informal credit, if any, because they had no formal credit history
- Identify customers who lack formal identification documents
- Design new products to fit the actual needs and realities of consumers, based on their behaviour and demographic information
- Enter new markets, increasing competition on price, quality and innovation
BENEFITS OF BIG DATA TO FI

- Rapid Customer Segmentation
  - Data mining of social signals from customers and prospects
  - Individualized reach campaigning
  - Tailor customer service & increase efforts to cross sell

- Speed client acquisition through automation

- Reducing risk through predictive analytics

- Identify behavior patterns among customers and use that information to stimulate better use of financial services and identify potential new users.

- Data analytics has become imperative to increase revenue, enhance customer experience, optimize cost structures and manage enterprise risks
BENEFITS OF DATA TO FI

- Enables Automation
- Improves Product Design
- Creating transparency
- Enabling experimentation to discover needs
- Can spur the entry of many millions of aspiring middle-class consumers into the formal credit system
Segmenting populations to customize actions (such as by creating more targeted product design or marketing)

Replacing or supporting human decision-making with automated algorithms

Innovating new business models, products, and services
RISKS

DIGITAL DATA INTRODUCES RISKS
RISKS

- Issues of data storage (Cloud)
- Issues of confidentiality
- Hacking and cyber security
- Compliance
GOALS
Credit analytics using new digital or alternative data sources, such as mobile call data records, utility payments, social media activity, and others to assess risk and extend credit to customers.

Mobile call data records and bill payments to Internet browsing patterns and social media behaviour can be use to create a new way to assess consumer risk, determine the creditworthiness of previously “invisible” consumers, and consequently offer convenient, quicker, and often cheaper loans to the previously underserved.

Unsecured, short-term, small-ticket consumer credit served at a dramatically lower cost than traditional loans
CREDIT SCORING

- Personal data from social media (facebook, twitter, linkedin)
  - Social standing, online reputation, professional connections
- Job history
- Location
- Call Detail Records (CDR)
- Socio-Economic and Demographic Data from NBS
CREDIT SCORING

- Leveraging client data points for credit scoring has helped increase productivity and reduce acquisition costs.
- Assesses the applicant’s character and ability to pay, leveraging insights from research in behavioural economics.
- Scans the customer’s phone and uses that data to provide a credit score within 20 seconds.
ACQUIRE NEW CUSTOMERS

- Use Social Media to identify most responsive audience (cost--)
- Use Social Media to verify consumer identity (cost--)
- Behavioural data allows for understanding of consumers propensity to take-up credit offers and “Ability to pay”
- Improved targeting of sales and distribution (Right offering, right time, right channel) of financial products
The emergence of new digital channels for customer engagement and financial service provision also enables a secondary service layer of business-to-business (B2B) innovation e.g. in Kenya kopo-kopo.
DEEPEN CUSTOMER RELATIONSHIP

- Data-driven innovation allows organizations to learn more about their customers and offer more direct interaction, delivering relevant content and personalized products.
- This led to increase in customer savings balances, a reduction in transaction costs at branches, and better customer segmentation.
- Help banks acquire new clients or increase the revenue per customer but also facilitate cross-selling activities, thereby lowering operating costs. Such solutions should be platform agnostic; mobile solutions, for example, now suit both urban and rural areas.
Big Data tools and techniques help banks detect prospects of fraudulent activities by highlighting the exact challenges, breaking down a customer’s exposure to each product and service, he uses. Key details such as revenue per customer, email responsiveness, product mix and the purchase channels used are examined before segmenting each customer into groups, pegged in terms of risks as well as opportunities.
AUTOMATING PROCESSES

- Digitizing workflows can improve efficiency and providing organization with richer and more structured internal datasets for further analysis e.g. digitizing loan process
- Improve business models using data analytics
- Building the operational capacity to respond to data
Big Data is opening doors for Banks, fintech firms and other non-microfinance organizations to enter the microfinance space.

The new competition can have a positive impact on MFIs as it pushes them to innovate around “alternative” credit scoring models and to develop mobile-based savings and loan products that can be easily accessed by clients.
Thank you