

# CATALYZING A RESPONSIBLE 'BIG DATA FOR DEVELOPMENT ECOSYSTEM'

PROGRESS REPORT  
JANUARY 2015- OCTOBER 2016



# BACKGROUND

Pulse Lab Kampala is a data innovation lab run by UN Global Pulse, and was established as an inter-agency initiative under the management of the United Nations Resident Coordinator in Uganda. The Lab contributes to the United Nations ‘Delivering as One’ approach while also serving as Global Pulse’s regional innovation hub for Africa.

## A TWO-TRACK STRATEGY

Pulse Lab Kampala has three primary objectives:

1. To achieve a critical mass of implemented data innovations
2. To lower barriers to adoption and scaling
3. To Strengthen the big data innovation ecosystem

Global Pulse’s two-pillar implementation strategy is based on the following roles:

### 1. INNOVATION DRIVER



Implement data innovation programmes across a network of Pulse Labs to provide UN system and development partners with access to the data, tools and expertise required to discover high-potential applications of big

data; develop innovative open source applications and platforms to improve data-driven decision making and support pilot-based evaluation of promising solutions.

### 2. ECOSYSTEM CATALYST

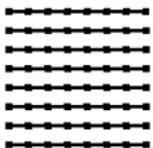


Contribute to the development of regulatory frameworks and technical standards to address data sharing and privacy protection challenges; engage key stakeholders on a priority innovation agenda; and provide public sector organisations

with policy guidance and technical assistance to strengthen their capacity for integrating real-time insights into operations.

Although Pulse Lab Kampala has been operating in Uganda since 2013, it was officially opened in 2015 by the Prime Minister of Uganda. The Lab has been working to build a community of practice in the region by bringing together UN agencies, academia, private sector and regulators to coordinate and drive action. In addition, the Lab has worked to channel stakeholder attention towards emerging and high priority topics (such as ‘data privacy and data protection’ and ‘data philanthropy,’) and to share knowledge and drive research in the region and at country level through conferences, workshops and data innovation events.

The activities and results of Pulse Lab Kampala as an **ecosystem catalyst** are summarized in this report and structured under the following sections:



**DEVELOPING RESPONSIBLE DATA PRIVACY AND DATA PROTECTION FRAMEWORKS**



**STRENGTHENING THE INNOVATION ECOSYSTEM**



**SUPPORTING BIG DATA FOR OFFICIAL STATISTICS**



**PROMOTING PARTNERSHIPS AND ENCOURAGING A GROWING COMMUNITY OF PRACTICE**

## DEVELOPING RESPONSIBLE DATA PRIVACY AND DATA PROTECTION FRAMEWORKS

- Technical expertise and recommendations to the Data Privacy Advisory Group,
- Recommendations for the development of UN Global Pulse's Big Data Impact Assessment Tool,
- Knowledge sharing and thought leadership on data privacy during four events hosted by the Lab, and
- Technical support to the Government of Uganda on a draft Data Privacy and Protection Bill.

As part of its advocacy and policy work, Global Pulse established a Data Privacy Advisory Group in 2014 that brings together data protection regulators, experts from the public and private sectors, civil society and academia. The Group serves as a platform for improving Global Pulse's privacy practices, guidelines and tools as well as building capacity and trust within the privacy and data analytics ecosystem. Dr. Okori G. Washington, Legal Specialist at MTN Uganda, and Dr. Bitange Ndemo, professor at the University of Nairobi's Business School, represent Kenya, East Africa in the Group. Other members of the Group from the region include: Mr. Lahoussine Aniss - General Secretary, Moroccan Data Protection Authority, Mr. Ridwaan Boday - Director, Head of TMT Law unit at ENSafrica in South Africa, Dr. Mouhamadou – Chairman of Personal Data Protection Commission in Senegal, Mrs. Drudeisha Madhub, Data Protection Commissioner, Prime Minister's Office in the Republic of Mauritius, Mrs. Hela Ben Miled – Commissioner in the Tunisian Data Protection Authority and Magistrate in the Tunisian Administrative Court of Justice.

Pulse Lab Kampala actively participated in the Data Privacy Advisory Group discussions and some of the projects pioneered by the Lab have been used as case studies to advance discussions on data privacy.

Pulse Lab Kampala also contributed to the development and testing of a Big Data Impact Assessment Tool, designed to help users consider both the risks and benefits of undertaking a data innovation project. The Big Data Impact Assessment Tool is currently being refined by Global Pulse and will be used for all data innovation projects.

Pulse Lab Kampala discussed data protection and data privacy issues during four events hosted by the Lab, including the 'Two Way Talk: How Radio Content Can Support the Monitoring and Achievement of the Global Goals.'

Finally, Pulse Lab Kampala worked with the Research Group of the Ugandan Parliament to support the formulation of the Data Privacy and Protection Bill for Uganda.

## STRENGTHENING THE INNOVATION ECOSYSTEM

During the reporting period, Pulse Lab Kampala responded to a growing demand for knowledge sharing and capacity building around big data for development from a diverse group of partners. The Lab regularly participated in international and national conferences sharing knowledge on the latest innovative applications developed with partners. Some of these events are highlighted below:

### RAISING AWARENESS TO DRIVE POLICY ACTION

- The [‘Why Data? Why all development actors should be part of the Data Revolution’](#) conference organized by the Swedish International Development Cooperation Agency in Stockholm in 2015. The Lab delivered a keynote address and joined several panel discussions where it shared new innovative ways of measuring progress for sustainable development.
- A [high-Level Conference on the ‘Data Revolution in Africa.’](#) organized by the African Union, the UN Economic Commission for Africa, the African Development Bank and UNDP in Addis Ababa where Pulse Lab Kampala discussed its data innovation work.
- The [‘Open and big data: Update on Uganda’s Data Revolution’](#) event organized by the Mobile Monday initiative in Kampala. The Lab provided a keynote address and contributed to discussions on the importance of public/private partnerships for using big data in sustainable development.
- A [‘High-level conference ‘Sustainable Development Goals in middle income and small islands developing states: a perspective from Africa’](#) organized by the Government of Cape Verde and UNDP Regional Centre for Africa in 2015. Pulse Lab Kampala delivered a presentation on how data innovation projects can support achieving the SDGs the African region.
- Pulse Lab Kampala delivered presentations during the third conference on [‘Advances in Geomatics’](#) organized by Makerere University in Kampala. The Conference, themed “Celebrating 25 years of Geomatics Education: Building for the Future” brought together academics and students from different parts of the world to share research findings about advances in Geomatics.
- At the [‘Use of mobile technology for statistical processes’](#) conference organized by the UN Economic Commission for Africa in Addis Ababa, Pulse Lab Kampala illustrated how big data and mobile technology can be leveraged for official statistics.
- In 2016, Pulse Lab Kampala held panel discussions on *‘Big Data: Responsible Use’* as part of the [‘Big Data Solutions for Development’](#) meeting organized by the World Bank Group and the Korea National Information Society Agency (NIA). The event brought together participants from fifteen developing countries to explore how big data can help address specific development challenges that each of the countries put forth.
- Pulse Lab Kampala delivered a presentation on *‘Making SMART decisions, the role of data access in pursuing evidence based decision making cities’* at the [‘East and Central African cities development forum’](#) organized earlier this year by the Kampala Capital City Authority.

## DATA INNOVATION INITIATIVES

As Global Pulse's innovation hub for the region, Pulse Lab Kampala supports the growing ecosystem of data innovation initiatives and shares knowledge and experiences with a growing number of data initiatives around the continent. Some highlights are:

- Presented in the '[Big Data Innovations for Agriculture](#)' conference organized by the World Bank's innovations lab in Kampala.
- Held knowledge-sharing sessions with the OCHA's Humanitarian [Data Exchange](#), [Kenya Open Data Portal](#) and [IBM Research Lab](#).
- Engaged in continuous knowledge exchange and mutual support in ongoing activities with the [Resilient Network Africa \(RAN\) Lab](#).
- Delivered a presentation during the [Quantified Planet 'Global Goals Lab'](#) launching event in Stockholm.
- Presentation to the [UNHCR Humanitarian Innovations Jam](#) in Kampala.
- Presented during an event on 'Big Data for Development' at an '[Entrepreneurs Forum](#)' organized by iHub in Nairobi.
- Showcased the work of the Lab in the DFID '[Humanitarian Marketplace](#)' in Kampala.

## DATA VALIDATION WORKSHOPS

Pulse Lab Kampala organized several workshops with stakeholders and partners to validate its latest data innovation projects. Participants provided user feedback on applications and new digital data. Such events allow the Lab to better understand the potential use of data innovations to advance sustainable development and support humanitarian practice in the region. They also guide the Lab to fine-tune applications and data analysis or to discard them if the work is not relevant. Participants included representatives from government, the UN, civil society, academia, private sector and innovation initiatives. Pulse Lab Kampala organized the following sessions:

### 'What can Airtime Purchase Data Tell us About Vulnerability to Poverty'

Partners: Airtel, Private Sector Analytics Providers  
Participants: 102

### 'How Radio Content Can Support Monitoring and Achievement of the Global Goals'

Partners: Embassy of Sweden  
Participants: 75

### 'How can Real-Time Analytics and Data Visualisation Help Monitor Public Service Delivery?'

Partners: UNAIDS, Ministry of Health  
Participants: 60

### 'How can Real-Time Analytics and Data Visualisation Help Monitor Public Service Delivery?'

Partners: UN Agencies  
Participants: 80

## BRIEFINGS AND BRAINSTORMING SESSIONS

Pulse Lab Kampala delivers 'in house' presentations on a regular basis showcasing ongoing work under Global Pulse's two-pillar implementation strategy to respond to partners' demand for knowledge sharing. In the first ten months of 2016 Pulse Lab Kampala has delivered 160 briefings and brainstorming sessions with a wide range of stakeholders:

- **47** of these meetings were with the private sector
- **42** were with government institutions
- **53** were with UN Agencies
- **28** with innovations hubs and civil society

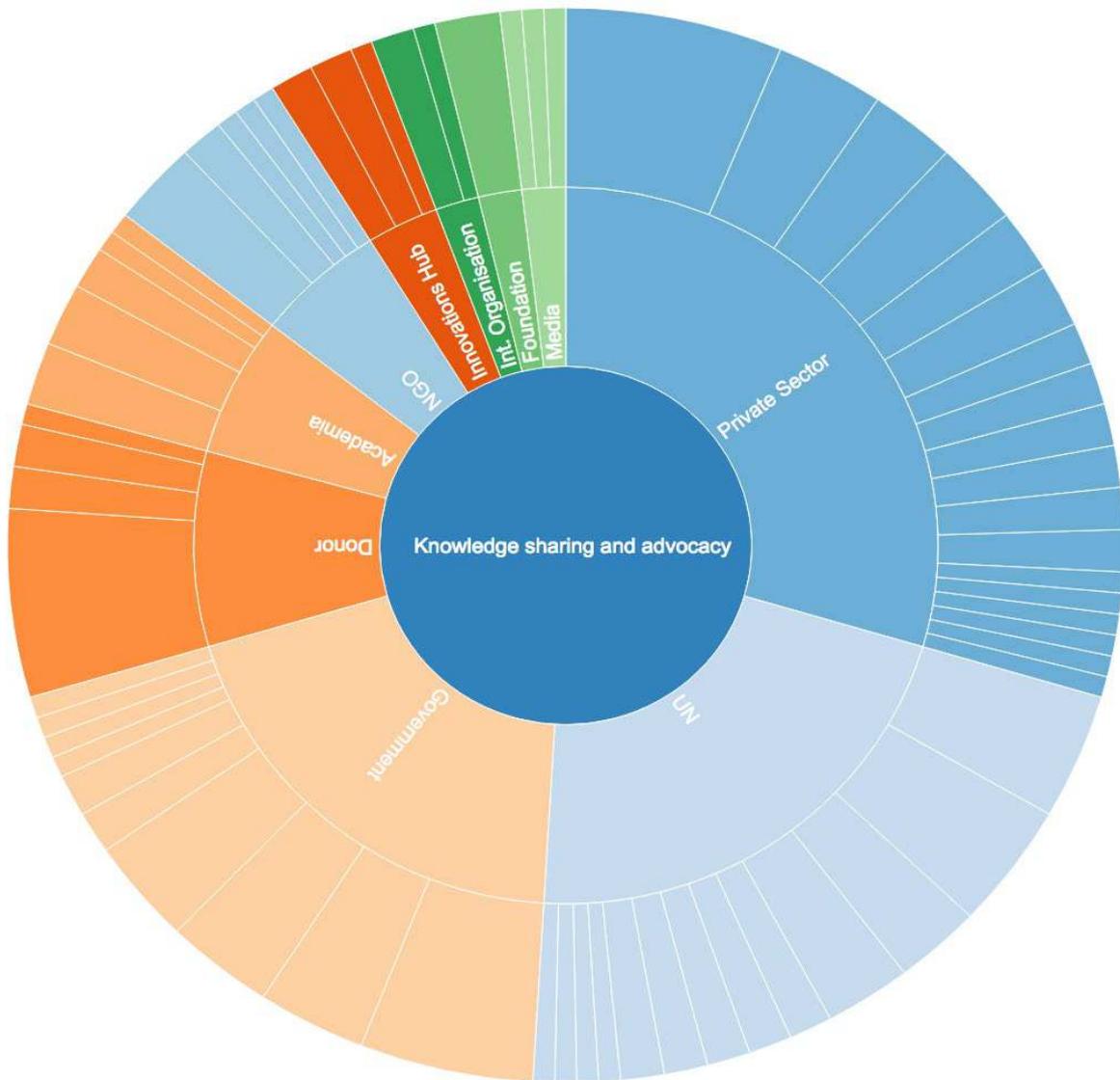


FIGURE 1. The figure represents the number of briefings and brainstorming sessions conducted by the Lab in 2016. The rings represent the number of interactions by category of stakeholders.

### High level officials who toured the Lab to get a first-hand view of its data innovation work:

Mr Nick Hurd - Minister of State, United Kingdom, Mr. Filippo Grandi - High Commissioner for Refugees, Ms. Izumi Nakamitsu - Assistant Secretary-General and UNDP Assistant Administrator for Crisis Response, Mr. Gunter Nooke - Personal Representative of the German Chancellor for Africa, Mr. Lamin Manneh - UN Resident Coordinator for Rwanda.

### Government counterparts:

OPTION B+ taskforce, the technical group on AIDS Programme in Uganda, the Uganda Bureau Of Statistics (UBOS), the National Water and Sewerage Company of Uganda, the National Planning Authority, the Delivery Unit in the Office of the Prime Minister, the Parliament of Uganda.

### Development partners:

the Embassy of the Kingdom of the Netherlands, the Swedish Embassy, the Norwegian Embassy, the Belgium Technical Cooperation and the Belgium Embassy in Kampala, the Department for International Development (DFID), the Hewlett Foundation, the World Bank.

### Civil society organisations and initiatives:

the International Growth Centre, Human Heredity and Health in Africa (H3Africa), Hivos International (HIVOS), Plan International, Montrosse, Resilient Africa Network Lab (RanLab), Joseph Fombi Westchester International Development Consulting Group.

### UN partners:

UNHCR, IOM, UNAIDS, UNDP Uganda, UNICEF Innovations Lab, UNDP Regional Service Centre for Africa, UN Development Operations Coordination Office (DOCO), United Nations Department of Economic and Social Affairs (UNDESA), the UN Uganda Town Hall, the Information System unit from UN Peacekeeping, OCHA's HDX Data Lab.

## CREATING KNOWLEDGE PRODUCTS

The Labs in the UN Global Pulse Network regularly contribute to the development of knowledge products that can accelerate the uptake of big data innovation projects by others. Pulse Lab Kampala has developed a toolkit for the technical deployment of the Radio Content Analysis tool, which will be launched in the coming months.

## SUPPORTING BIG DATA FOR OFFICIAL STATISTICS

Pulse Lab Kampala organized an event entitled 'Uganda's Data Revolution: Mobile Data to Support Statistics' for the mobile industry and the Uganda Bureau of Statistics (November 2015) -- <http://www.unglobalpulse.org/events/uganda%E2%80%99s-data-revolution-mobile-data-support-statistics>

The Lab is in discussion with the Ugandan Bureau of Statistics on piloting initiatives to tap into new digital data that can help strengthen national statistical systems.

As part of these efforts, the Lab developed a prototype that can be used as a proxy to track poverty trends. In Northern Uganda, where poverty levels are high and the majority of the population lives in rural areas, a proxy indicator of poverty is roofing material. As the household economy improves, families often upgrade their dwelling by changing from traditional grass thatch to iron sheets. Pulse Lab Kampala has developed an image processing software that uses satellite imagery to count roofs and identify the type of material they are constructed from. The tool and methodology complement existing statistical tools that use surveys and primary data collection to assess poverty levels. Read more: <http://unglobalpulse.org/projects/measuring-poverty-machine-roof-counting>

More about the Lab's view on big data for official statistics can be found at: <http://www.unglobalpulse.org/blog/how-big-data-can-strengthen-official-statistics-africa-view-pulse-lab-kampala>

## PROMOTING PARTNERSHIPS

Pulse Lab Kampala continued to grow its networks of partners to provide secure access to anonymized big data, analytical tools and technical support.

### ENGAGING WITH THE PRIVATE SECTOR

Pulse Lab Kampala strengthened its relations with mobile network operators (MNOs) in the region. While the process of formalising partnerships with MNOs has been challenging, there have been promising results.

In partnership with the Ugandan Ministry of Health and the World Health Organization (WHO), the Lab showcased examples of how data from telecom companies can be used to enhance response to disease outbreaks. See some examples here: <http://pulselabkampala.ug/diseasemapping>, <http://diseaseoutbreak.unglobalpulse.net/uganda/>.

Pulse Lab Kampala participated in the 2015 Data for Development (D4D) challenge organized by the MNO Orange and its partners. The Lab received an award for its project “Mobility profiles and calendars for food security and livelihoods analysis” conducted with WFP Senegal and with the Politécnica University of Madrid. Project information is available at: <http://pulselabkampala.ug/d4d-senegal/d4d-senegal-poster.pdf>

The Lab is an active participant in the industry forum [Mobile Monday](#), a community of mobile industry visionaries and developers fostering cooperation and cross-border business development through events, best practices and trends from global markets.

As such, the Lab has hosted several of the Forum’s sessions at the Lab and organized, together with partners, an event entitled ‘[Uganda’s Data Revolution: Mobile Data to Support Statistics](#). The event highlighted innovative pilots conducted using mobile data to generate national statistics and gathered 70 participants linked to the mobile industry.

Pulse Lab Kampala engaged with start-up companies in Uganda to explore the use of digital data to advance the Global Goals. In 2015, with support from the Lab, data from a supermarket chain was used at a DATA4FOOD Hackathon organized by the Leiden University.

### PARTNERING WITH UN AGENCIES

Pulse Lab Kampala deepened its institutional engagement within the UN. The key partners in data innovation projects in 2015 - 2016 include: the World Health Organization (WHO), the United Nations Population Fund (UNFPA), the Joint United Nations Programme on HIV/AIDS (UNAIDS), the United Nations Development Programme (UNDP), and the UN Refugee Agency (UNHCR).

## ENCOURAGING A GROWING COMMUNITY OF PRACTISE

Since it opened its doors in 2015, Pulse Lab Kampala has sought collaborations with academic groups in Africa aimed at applying data science to address humanitarian and development challenges. Collaborations have been undertaken with the following universities:

- Makerere University Kampala, Uganda
- Dedan Kimathi University of Technology, Kenya
- Nelson Mandela African Institute of Science and Technology, Tanzania
- Stellenbosch University, South Africa
- University of Edinburgh, United Kingdom
- Sheffield University, United Kingdom
- University of Gothenburg, Sweden
- Politecnica University of Madrid

Pulse Lab Kampala organized the second 'Data Science in Africa' initiative in 2016 together with partners from Makerere University (Uganda), the Dedan Kimathi University (Kenya), IBM Research Africa, the Uganda Communications Commission, the University of Sheffield (UK), Facebook and Google. The event's over 150 participants attended a three-day course at Makerere University, which brought them up to speed with what is happening in data science in Africa. Some of the lecture topics included: "From raw data to meaningful features," "Working with Spatial Data", "Data Exploration & Visualization" and "Text Mining." This was followed by a two-day workshop at Pulse Lab Kampala offices to discuss how data science can be used for development and humanitarian action and be best applied to help support and achieve the Global Goals. Read more: <http://unglobalpulse.org/news/data-science-in-africa-2016>

One of the Lab's long-standing collaborations is with Makerere University's Artificial Intelligence Research Group (AI Research Group), that specializes in the application of artificial intelligence and data science to challenges common in the developing world. Aimed at supporting the growth of the community of young data scientists in Kampala, Pulse Lab and the AI Research Group, organizes weekly seminars on data science and hosts them once a month at the Lab. Read more about the Lab's work in this area at: <http://www.unglobalpulse.org/news/building-fertile-ground-data-science-uganda>.

As a regional hub for innovation, Pulse Lab Kampala encourages learning and development by welcoming young graduates to join the Lab for a period of 2-3 months. To date, the Lab has hosted graduates from Makerere University, Egypt's Information Technology Institute, the Uganda Technology and Management University and the University of California in the US.

## ACCELERATING PUBLIC SECTOR ADOPTION

In the last two years Pulse Lab Kampala has developed strong working relations with government institutions, UN Agencies and civil society organisations. To date, these collaborations have resulted in the following data innovation projects:

	PROJECT	PARTNERS	STATUS
	ANALYZING ATTITUDES TOWARDS CONTRACEPTION AND TEENAGE PREGNANCY	UNFPA	COMPLETED
	ANALYZING SEASONAL MOBILITY PATTERNS	WFP, POLITECNICA UNIVERSITY	COMPLETED
	PUTTING PEOPLE'S VOICES AT THE CENTRE OF DEVELOPMENT	UNICEF	COMPLETED
	APPLICATION TO MONITOR AIRTIME EXPENDITURE	UGANDA BUREAU OF STATISTICS, PRIVATE SECTOR	COMPLETED
	DATA VISUALISATIONS TO STRENGTHEN DECISION-MAKING	GOVERNMENT OF GHANA, UNDP	COMPLETED
	APPLICATION TO ACCESS SPATIAL DATA FOR ENVIRONMENTAL POLICY	NBSAP FORUM, UNDP, GOVERNMENT OF ZIMBABWE	COMPLETED
	INFORMING GOVERNANCE WITH SOCIAL MEDIA	UNDP	COMPLETED
	APPLICATION TO STRENGTHEN RESPONSE TO DISEASE OUTBREAKS	MINISTRY OF HEALTH OF UGANDA	ONGOING
	APPLICATION TO MONITOR IN REAL TIME HIV PREVENTION	MINISTRY OF HEALTH OF UGANDA, UNAIDS	ONGOING
	APPLICATION FOR AUTOMATED IDENTIFICATION AND COUNTING OF ROOFS	UGANDA BUREAU OF STATISTICS, NATIONAL PLANNING AUTHORITY	ONGOING
	BRIDGING THE DIGITAL DIVIDE: APPLICATION FOR ANALYSING RADIO CONTENT	UNDP, OFFICE OF THE PRIME MINISTER, NGOS, ACADEMIA	ONGOING

These data innovation projects were carried in collaboration with the following institutions and organisations:

**Government:**

- In Uganda: the Ministry of Health, the Uganda Bureau of Statistics (UBOS), the National Planning Authority (NPA), the Office of the Prime Minister (OPM), the National Water and Sewerage Corporation (NWSC), the Kampala Capital City Authority (KCCA), the Ministry of Gender, Labour and Social Development (MGLSD), the Parliament of Uganda
- The Government of Zimbabwe
- The Government of Ghana

**UN Agencies:** UNAIDS, UNDP, UNFPA UNICEF, WFP, WHO

