Global Pulse is an innovation initiative of the United Nations working to harness big data, artificial intelligence and other emerging technologies to support sustainable development and humanitarian action. Global Pulse works through a network of regional innovation labs, known as Pulse Labs, and with partners to build and implement innovative solutions and to provide policy guidance and technical assistance to accelerate adoption of data innovation.

YEAR IN REVIEW

The data revolution is no longer a new topic but a reality trying to catch up with the expectations it has generated. As a result, big data and artificial intelligence emerged as important issues in 2017, with the UN driving global discussions on how to harness data and analytics capabilities to achieve the 2030 Agenda. This included the adoption of a Global Action Plan for Sustainable Development Data that resulted from the inaugural UN World Data Forum. And the first AI for Good Global Summit was convened to ensure that the benefits of artificial intelligence serve humanity and help to accelerate progress towards the Sustainable Development Goals.

In 2017, Global Pulse pursued opportunities to scale and replicate proven solutions, and to establish frameworks for responsible data privacy and ethical innovation. This report presents examples of data-driven solutions that Global Pulse tested and developed with partners in 2017, and outlines activities the Pulse Labs engaged in to enable a thriving data innovation environment.

Global Pulse implemented over 20 innovation projects and tools, adding to the growing body of evidence of practical examples of data innovation for sustainable development and humanitarian action. Several of the applications developed by the Pulse Labs were adopted and mainstreamed by partners. A tool created by Pulse Lab Jakarta, which analyses the impact of climatic events, was installed in the situation room of the Executive Office of the President and is being mainstreamed to other countries in Asia.

Additionally, new features were added to a suite of tools developed by Global Pulse. Pulse Lab Jakarta developed an analytics platform to monitor the onset and effects of cyclones around the world, by building upon functionalities of an existing crisis analysis tool. Likewise, Pulse Lab Kampala added new languages to its speech-recognition technology tool.

Throughout 2017, Global Pulse also spearheaded efforts to foster an enabling environment for data innovation. Global Pulse worked with international experts to develop data privacy and data ethics frameworks and risk management tools for responsible use of data. A Guidance Note on Big Data for SDGs: Data Privacy, Data Protection and Ethics was adopted by the United Nations Development Group. This document is the first policy guidance on big data and privacy endorsed by over 30 UN agencies.

In parallel, Global Pulse raised awareness of the value of data innovation by hosting several high-impact events. Pulse Lab Jakarta and the Ministry of National Development Planning held the first Data Revolution for Policymakers Conference in Indonesia. Pulse Lab Kampala engaged African youth through the Data Science Africa workshop, which will be scaled up to two events in 2018 due to increased participation and interest. At the UN General Assembly, Global Pulse convened governments, entrepreneurs and CEOs of leading technology companies to outline a roadmap on innovation for SDGs. The Data for Climate Action Challenge advanced the practice of data philanthropy by galvanizing a diverse coalition of companies from different industries and countries. Multiple datasets were made available to research teams around the world to identify solutions and accelerate action on climate change.

Finally, to support public sector understanding and adoption of data innovation, Global Pulse and its Pulse Labs held over 25 workshops, presented in 60 regional and international events, and engaged with 130 organizations from the UN, academia, and private sector through over 450 briefings and brainstorming sessions.

It is evident that the importance of a data revolution to achieve the SDGs is being embraced by institutions around the world. At the same time, the impact of the data revolution on society has created a new frontier of ethical and human rights challenges. Looking ahead, Global Pulse will leverage its cumulative expertise and extensive network of partners to advance rights-centric innovation within the UN, and catalyze global advocacy to ensure a safe and equitable digital future.
HIGHLIGHTS FROM THE LABS

THE DATA FOR CLIMATE ACTION CHALLENGE

Global Pulse, Western Digital and the Skoll Global Threats Fund

11 companies donated data and tools
450 teams of data scientists from 67 countries
6 winning projects

THE STATE OF MOBILE DATA FOR SOCIAL GOOD

A publication by Global Pulse and GSMA

Identifies over 200 projects or studies leveraging mobile data for the SDGs

CYCLOMON

Pulse Lab Jakarta

An analytics and visualization platform to monitor action before, during and after cyclones

DATA SCIENCE AFRICA

Pulse Lab Kampala

A workshop with:
116 participants from
60 organizations
33 presentations and panel discussions held

USING BIG DATA TO STUDY RESCUE PATTERNS IN THE MEDITERRANEAN

A project published in the Fatal Journeys Volume 3, an IOM annual global report

A GUIDANCE NOTE ON BIG DATA FOR SDGS: DATA PRIVACY, DATA PROTECTION AND ETHICS

Adopted by the United Nations Development Group

First policy guidance on big data and privacy endorsed by over 30 UN agencies

27 academic papers produced by the Pulse Labs

Participation in 100+ conferences, events and workshops

Pulse Labs reached 70,000 followers on social media

11
450
200
6

27
116
100+

27
116
100+

70,000
Global Pulse is a United Nations innovation initiative that was established to assist the UN to transition development and humanitarian practice and policy implementation to more agile, adaptive ways of working that leverage real-time feedback and the power of data analytics.

Global Pulse harnesses the opportunities of big data, AI, and other emerging technologies for sustainable development and humanitarian action. The Initiative builds high-impact innovative solutions for UN and Government partners and provides policy guidance and technical assistance for mainstream adoption of innovation. Global Pulse works through a network of Pulse Labs in Jakarta, Indonesia, in Kampala, Uganda, and in New York at the UN Headquarters.

OBJECTIVES

The overarching objectives of Global Pulse are to:

I) achieve a critical mass of high-potential applications of big data and AI
II) lower systemic barriers to adoption and scaling, and
III) strengthen the data innovation ecosystem.

The two-pillar implementation strategy is based on the following roles:

> Work with the UN system, governments, academia and private sector partners to discover, build, pilot and evaluate high-potential applications of big data and AI to achieve the 2030 Agenda.

> Contribute to global efforts to establish trusted frameworks for responsible data practices and ethical innovation.

> Advocate for greater public awareness and support communities of practice across disciplines and geographies to accelerate development of big data and AI applications.

> Provide public sector organisations with the policy guidance and technical assistance needed for mainstream adoption of innovation.
IMPLEMENTATION MODALITIES

Global Pulse employs three engagement models for working with partners within the context of data innovation. These three models are structured to address different project and partner contexts, preserving flexibility while creating greater structure.

Executor
Global Pulse performs analytics and product development tasks in-house and takes responsibility for all project outputs. UN agency or Member State partners contribute moderate staff resources to support the project and provide content and subject expertise.

Facilitator
Partners primarily perform data analysis while Global Pulse focuses on project facilitation, building a bridge between private sector capacity and public sector partners.

Technical advisor
Partners are responsible for the analytics and project outputs and Global Pulse is brought in to provide technical guidance as an advisor or for specific expertise such as data privacy regulation or data access policies.

PULSE LABS

Global Pulse brings together governments, UN agencies and partners from academia and the private sector to test, refine and scale methods for using big data and AI to support the achievement of the Sustainable Development Goals. Pulse Lab New York, established in 2009, serves as the headquarters of Global Pulse and is the thought-leadership and knowledge sharing hub for the network of Pulse Labs.

The Labs consist of multidisciplinary teams of data scientists, engineers, designers, social scientists and lawyers who work together with development and humanitarian experts to prototype and implement data innovation programmes. The Pulse Labs share knowledge from innovation projects by producing reports and technical papers as well as project briefs.

PARTNERSHIPS

A network of strategic partners, at both the global and country level, is required to ensure sustainable access to the resources that drive data innovation at the UN. In particular, partners collaborate with Global Pulse through contributions of:

- **Data:** providing access to data to support research at the Pulse Labs
- **Technology:** sharing tools for data mining and analytics, or computing capabilities
- **Expertise:** making engineers, data scientists or researchers available to collaborate on projects
- **Sponsorship:** providing funding to support Global Pulse’s Labs, events, and capacity-building efforts
Global Pulse serves as a safe space for innovation and experimentation with new sources of data and emerging digital technologies. Through its network of Pulse Labs it works with UN agencies, governments, data practitioners in academia, and the private sector to discover, build, pilot and evaluate data innovation projects and toolkits to help achieve the SDGs.

In 2017, Global Pulse worked on 22 data-driven innovation projects, fit-for-purpose prototypes and toolkits. This section highlights some of the newest explorations from the Pulse Labs, as well as some of the projects that were adopted by partners, the latter representing an important step to scale.
## PROJECT LIST

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In spite of policy and media attention and increased search and rescue efforts, the death toll in the Mediterranean has continued to rise. Global Pulse worked with the UN High Commissioner for Refugees (UNHCR) on a project that analyzed new big data sources to provide a better understanding of the context of search and rescue operations in the central Mediterranean.

The project used vessel location data (AIS) to determine the route of rescue ships from Italy and Malta to rescue zones and back, and combined it with broadcast warning data of distress calls from ships stranded at sea. The insights were used to construct narratives of individual rescues and gain a better understanding of collective rescue activities in the region.

This method provides a comprehensive and quantitative picture of rescue efforts that can complement current methods of data collection that tend to focus on the most dramatic or severe incidents. The analysis could be applied to similar events by using predictive modeling, real-time rescue monitoring and logistics optimization.

The project was featured in the International Organization for Migration (IOM)’s 2017 global report Fatal Journeys, which identifies opportunities to improve data collection and data analysis for more accurate and timely information on missing migrants. Global Pulse also designed an interactive visualization that shows the magnitude of rescue operations in the Mediterranean and provides easy access to the analysis.

http://rescuesignatures.unglobalpulse.net/mediterranean/
UNDERSTANDING MOVEMENT AND PERCEPTIONS OF MIGRANTS AND REFUGEES IN EUROPE THROUGH SOCIAL MEDIA

As refugees travel across multiple borders, they encounter increasing protection risks, particularly when routes change, legal practices evolve and borders close. This forced displacement represents a challenge for humanitarian organizations working to provide assistance to people fleeing dangerous situations.

This project used data from Twitter to monitor protection issues and the safe access to asylum of migrants and refugees in Europe. Global Pulse and UNHCR created taxonomies in six languages to explore interactions and xenophobic sentiment of host communities towards displaced populations. In addition, to confirm the value of social media data during emergencies, the project conducted ten mini-studies.

Global Pulse and UNHCR produced a White Paper that details the findings and methodologies of the initial exploration. The paper outlines preliminary observations of how the Europe Refugee emergency is reported on social media.

Global Pulse and UNHCR are now developing a real-time situational awareness tool to inform operational responses in support of the Europe Emergency Regional Protection strategy. The tool will enable UNHCR to continuously monitor and analyse relevant social media feeds.


USING ADVANCED ANALYTICS TO MODEL AND PREDICT RISK FACTORS OF NON-COMMUNICABLE DISEASES

Non-communicable diseases (NCDs) such as cardiovascular diseases, cancer, diabetes and chronic respiratory diseases are responsible for 70% per cent of all deaths globally, according to the World Health Organization (WHO). NCDs disproportionately affect people in low- and middle-income countries where more than three quarters of global NCD deaths – 31 million – occur. There is an opportunity to use the volume of health, behavioural, socioeconomic and environmental data that are generated today, to understand risk factors and health outcomes associated with NCDs.

Global Pulse together with WHO and the Clalit Research Institute, an Israeli WHO Collaborating Centre, published a review of the opportunities of big data for monitoring NCDs in the medical journal The Lancet. The publication is the result of an ongoing collaboration focused on big data innovation at WHO Europe.

Based on this work, Global Pulse and the WHO Global Coordination Mechanism on NCDs are developing an advanced analytics platform. The platform will use machine learning and deep learning...
methods to model and predict known and new NCD risk factors - such as tobacco use and alcohol consumption - as well as NCD health outcomes and behaviours. The objective is to enable timely and detailed insights into the complexities of the prevalence of NCDs and their impact on policy action. The project will commence in 2018.


DETECTING STRUCTURES IN SATELLITE IMAGES WITH AI DURING HUMANITARIAN EMERGENCIES

Estimating the number and size of forcibly displaced populations is key for allocating resources and assistance during humanitarian emergencies. Satellite image analysis is one of the most effective means to provide accurate data to understand the situation on the ground. The manual analysis of satellite imagery has thus far been the most reliable method of mapping structures in settlements built to house displaced populations. Although automated methods exist, they have proven insufficient for the complex high-resolution satellite imagery necessary for mapping structures in different conditions and locations. When dealing with conflict and humanitarian scenarios, precision in satellite image analysis is key to supporting critical operations on the ground.

UNOSAT is a technology-intensive programme delivering imagery analysis and satellite solutions to relief and development organizations. UNOSAT and Global Pulse partnered to apply artificial intelligence frameworks that can help analysts to identify and count structures within settlements in high-resolution satellite imagery in a fraction of the time and cost that manual analysis requires. The project developed multiple deep neural network architectures that were tested in several humanitarian crises in Uganda, South Sudan, Nigeria and Iraq. Global Pulse and UNOSAT will work in 2018 to refine the algorithm in order to increase precision and to include it into current operational pipelines.

ESTIMATING SOCIO-ECONOMIC INDICATORS FROM MOBILE PHONE DATA IN VANUATU

Building on past studies which show that data from mobile phones (in particular from call details records and airtime credit purchases) can be used to understand socioeconomic conditions, Pulse Lab Jakarta conducted research into the potential of using mobile phone data to produce a set of proxies for education and household characteristics.

Using anonymised mobile data from the Pacific island of Vanuatu, proxies for four types of statistical indicators were extracted from the data provided by a local carrier. These indicators included education, household assets, household expenditure, and household income.

The findings confirmed a relatively strong correlation between indicators from the mobile dataset and data from the official statistics provided by the National Statistics Office in Vanuatu. The use of mobile phone data to estimate socioeconomic indicators advances other considerations that seek to develop reliable proxies based on such data to measure and achieve the SDGs.
ACCELERATING DEVELOPMENT IN UGANDA WITH SPEECH RECOGNITION TECHNOLOGY

In a world of increasing interconnectivity, radio remains a primary source of information for communities in many parts of the world, including in Uganda. Radio is a widespread medium for community discussions on subjects from healthcare and education to politics and natural disasters.

Pulse Lab Kampala collaborated with the Stellenbosch University in South Africa to build speech recognition technology that can convert public discussions on radio broadcasts into text for several languages spoken in Uganda including English, Luganda, Acholi, Lugbara and Rutooro.

In 2017, the Lab worked with government and UN partners on five projects to validate the usefulness of insights from radio talk.

**Phase Communicate and Share Findings**

**Understanding Perceptions to a Refugee Influx**

An outbreak of conflict in 2016 caused thousands of South Sudanese to flee to neighbouring countries, especially Uganda. Pulse Lab Kampala was tasked by the UN in Uganda with unearthing the attitudes and intentions of host communities towards refugees. The Lab used automated speech-to-text technology to analyse local radio content. Findings showed a high degree of acceptance of refugees among Ugandans at the time when the influx started. Some concerns were expressed about the spread of infectious diseases, the increase in pregnancies and the right of refugees to farmland.

**Documenting the Impact of Small-Scale, Local Disasters**

First hand testimonials on how natural hazards impact communities are common in public radio discussions, especially at the moment when a community is being affected. The Lab used the radio tool to extract data on the impact of small-scale disasters on local households and communities. The analysis yielded useful insights regarding the extent of the damage and the communities’ coping strategies. The project was conducted in collaboration with UNDP and the National Emergency Coordination and Operations Centre (NECOC) in the Office of the Prime Minister.

**Gaining Insights into Malaria Outbreaks**

Malaria is a leading cause of death in Uganda, accounting for over 27% of deaths annually. Pulse Lab Kampala mined radio data to identify the volume of malaria-related discussions by filtering relevant keywords from local dialects. The project yielded only a low number of relevant discussions for the research period, but revealed opportunities for refining the radio tool. In addition, the tool captured early discussions regarding an outbreak of cholera 10 days before health authorities officially declared an outbreak.

**Gauging the Quality of Health Service Delivery**

This project was conducted with the Ministry of Health and with guidance from the Gothenburg University in Sweden. The analysis filtered radio conversations for four categories related to the delivery of healthcare services: health facilities, health sector governance, public health, and access to medicine. It captured a large volume of discussions, from complaints and reports of the poor quality of facilities to difficulties people face when trying to access medicine. This suggests insights from radio data could be used to evaluate and improve the quality of healthcare services.

**Monitoring the Effectiveness of Radio Campaigns**

International NGO Save the Children ran a global campaign to promote better access to healthcare and quality education for all children. To reach children in remote areas in Uganda, the campaign used radio and video messages and produced an original song. The Lab monitored the frequency with which the song was played on radio stations in the cities of Gulu and Kampala. The detection rate of the software was 68% with zero false alarm rate. This suggests speech recognition technology can be an effective monitoring and evaluation method of radio campaigns.

EXPLORING WAYS TO OPTIMIZE PUBLIC TRANSPORT IN INDONESIA WITH TWITTER DATA

Some estimates for Greater Jakarta put the population at more than 30 million people. Within the boundaries of the city itself, the transport system carries 1.38 million commuters daily. In collaboration with Jakarta Smart City and the Indonesian Institute of Statistics, Pulse Lab Jakarta investigated whether Twitter data could help provide policy makers with regular updates to best optimise public transport.

Origin-destination statistics for the 10 cities in Greater Jakarta were produced from GPS-stamped tweets, by identifying a subset of people who commute between these areas. The initial results were calibrated based on the population distribution and Twitter usage distribution, then verified with the Indonesian Bureau of Statistics’ official commuting records.

The similarity between the official commuter flows and the commuting statistics inferred from Twitter (visualised in the chord diagram) confirms that geo-tagged tweets can reliably fill existing information gaps in the official commuting statistics. Additionally, the research team was able to accurately determine (based on comparison with the Indonesian Institute of Statistics data) the top two destination cities for people travelling from 8 of the 10 origin cities in Greater Jakarta, decreasing the cost related to conducting surveys to figure out such commuting patterns. The Institute of Statistics is planning to use this method to enhance commuting statistics produced by the Government.

Creating taxonomies, or sets of keywords, is an important step in analysing social media data. However, building a taxonomy for less-known languages, including local dialects, jargon and even alphabets, is often challenging.

In 2017, Pulse Lab Jakarta launched the second pilot of Translator Gator, a gaming platform designed to crowdsource the translation of disaster-related keywords in almost 30 languages spoken throughout the 10 ASEAN Member States and Sri Lanka.

Almost 1.8 million activities across four gaming components (translation, evaluation, classification and synonyms) were recorded within 100 days. The platform is a proof of concept which exhibits how translations that have been crowdsourced online can help relevant authorities understand the conversations and behaviours of local communities during a disaster.
Natural climatic events, such as El Niño, create irregular weather patterns that cause suffering to many farmers and their families. In response to the effects of the 2015 El Niño, Pulse Lab Jakarta teamed up with the World Food Programme and the Food and Agriculture Organisation to develop an integrated, multi-tier tool that provides near real-time analysis of the impact.

The Vulnerability Analysis Monitoring Platform for Impact of Regional Events (VAMPIRE) brings different data streams into a single interactive map, showing the extent of drought affected areas, the impacts on markets, and the coping strategies and resilience of affected populations. The streams include population data, national socio-economic data, household food security data, rainfall anomaly data, standardised precipitation index and vegetation health index.

The platform was adopted by the Executive Office of the President to be used in their situation room. In 2017, the platform was further developed to estimate the impact of government programmes as part of their regular monitoring and oversight.

VAMPIRE was also scaled up and implemented in Sri Lanka. Beyond a one-way transfer of technology, it was contextualised to the country with improvements to aid the efforts of the Sri Lankan Ministry of Disaster Management. VAMPIRE was one of the winners of the 2017 WFP Innovation Challenge.

**CYCLOMOM**

Big data can play a pivotal role in helping disaster authorities to enhance preparedness, including their ability to monitor and respond to natural disasters like cyclones. In 2017, Pulse Lab Jakarta developed CycloMon, an analytics and visualisation platform with capabilities to monitor action before, during and after cyclones across the world.

Its basic functions rely on a series of automatic processes that collect, analyse and visualise information from weather satellites on the path of a cyclone, combined with insights from social media and baseline information on the preparation for and impact of the cyclone on communities. CycloMon allows for the exploration of rich, country-specific information mined from various sources of social media, such as text-, image-, and video-based content.

To demonstrate how the platform can help cyclone management units in the region, it was tested during Tropical Cyclone Winston, which occurred in the Pacific. Pulse Lab Jakarta will work with organizations in the region to further develop the tool in 2018.
Global Pulse works on a programme of catalytic activities designed to foster an enabling environment for greater uptake of big data and AI in development and humanitarian contexts. These activities include:

I) lowering barriers to scale, by contributing to global efforts to establish trusted frameworks for responsible data practices and ethical innovation

II) strengthening the innovation ecosystem, by connecting communities of practice across disciplines and geographies to accelerate the rate of discovery of high-potential applications of data science

III) enabling institutional adoption, by providing public sector organizations with the policy guidance and technical assistance needed for mainstream adoption of innovation
RAISING AWARENESS
TO DRIVE POLICY ACTION

The Inaugural UN World Data Forum

The inaugural UN World Data Forum, hosted in January in Cape Town, South Africa, gathered more than 2,000 participants for 73 wide-ranging plenary and breakout sessions. The Forum launched the Global Action Plan for Sustainable Development Data in response to a call for modernizing national statistical offices in order to achieve the SDGs by 2030.

Global Pulse played a key role in organizing the Forum and hosted three events, including a plenary session on Big Data Innovations for Sustainable Development. The plenary featured a wide array of examples of data innovation projects and initiatives from across the UN and private sector. A panel of experts from the Office of the President of Indonesia, the United Parcel Service (USA), Spanish bank BBVA, and the UN World Food Programme discussed opportunities and challenges of leveraging big data for public good, emphasizing the importance of public-private partnerships, without which innovation efforts cannot be realized and scaled.

Global Pulse was elected as a member of the Programme Committee, which will be responsible for guiding and designing the 2018 World Data Forum to take place in Dubai, in the United Arab Emirates.

The Data Revolution for Policy Makers Conference in Indonesia

This two-day conference was hosted in February by Pulse Lab Jakarta, the Indonesian Ministry of National Development Planning, and the Knowledge Sector Initiative (KSI) under the theme Expanding the Evidence Base: Government Demand for Advanced Data Analytics in Indonesia. The event brought together 300 Indonesian and international experts and practitioners, including senior government and UN officials, to discuss new ways of analysing and sourcing data in order to provide better services for the public.

The conference featured several plenary sessions on issues related to big data and real-time analysis techniques for planning, monitoring and evaluating social development policies. It included interactive displays of citizen data collection, data visualisations, data analysis and hands-on data innovation sessions facilitated by field experts.


“Timely and quality data is essential, it gives government the opportunity to make the right decisions especially in challenging situations. Data can provide insight and should be accessible wherever, whenever it is needed.”

DOUGLAS BRODERICK, UN RESIDENT COORDINATOR IN INDONESIA

High-Level Technology and Innovation Event at the UN General Assembly

UN Global Pulse and the SDG Action Campaign hosted a high-level technology and innovation event during the UN General Assembly week in September. The event convened governments, CEOs of leading technology companies and innovators to identify opportunities and challenges in accelerating innovation for sustainable development and humanitarian solutions.

The event was opened by the President of the UN General Assembly, followed by presentations from the founder of social networking service Linkedin, the CEO of cloud computing company Salesforce, and the founder of Mara Group, a Pan-African multi-sector business services company. It continued with a panel discussion with the President of Estonia, the Prime Minister of Denmark and executives from Mozilla, Dangote Group, Bharti Enterprises and Wikipedia. The panel identified public-private partnerships as instrumental in accelerating adoption of the opportunities presented by the data revolution.

Government representatives present at the event then made interventions that were focused on the importance of accountability for responsible use of data and the need for strong privacy and data protection frameworks.
The AI for Good Global Summit

The AI for Good Global Summit was organized in June in Geneva, Switzerland, by the International Telecommunication Union (ITU) and the XPRIZE Foundation, in partnership with 20 UN agencies and offices, including Global Pulse. The Summit sought to speed the development of, and access to, AI solutions to address humanity’s most enduring problems, such as poverty, malnutrition and inequality.

Global Pulse worked with ITU to shape the overall programme of the Summit and leveraged its network of partners to identify expert panelists. In addition, the Pulse Labs spearheaded two workshops on Data Ethics and Data Privacy and Security that framed discussions around best practices for enhancing responsible design and use of AI.

A workshop on Data for Social Good co-hosted with the UN Department of Economic and Social Affairs (UN DESA), reviewed current and future opportunities of AI and proposed solutions to challenges in implementing AI for social good projects. Global Pulse spoke in a number of other events including an address during the Summit’s opening plenary.


Privacy, Data Protection and Digital Ethics

Big data and emerging technologies have the potential to revolutionise development and humanitarian practice. At the same time, legitimate concerns about data privacy, the complexity of self-learning algorithms, and a fragmented regulatory landscape make the development of standardized, scalable approaches to data-use challenging. Global Pulse continued to actively participate in developing data privacy frameworks and raising awareness on the responsible use of data and technology for sustainable development and humanitarian action.

Global Pulse developed a Risk Assessment Tool, which is a mechanism for understanding and managing risks, harms and benefits associated with big data use. The tool incorporates a rights-based approach to data to ensure that the right to privacy is assessed in conjunction with all other rights that data use or non-use may affect. The tool has been integrated in Global Pulse’s operations and has been used by a variety of partner organizations. In 2017, Global Pulse continued to work with UN partners to further refine the tool and built a user-friendly online application.

The Data Privacy Advisory Group (PAG), a forum of experts from public and private sector, academia and civil society, continued its deliberations on data privacy and digital ethics throughout 2017. The PAG held its annual meeting at the UN headquarters in New York as well as regional side meetings and calls. The Group contributed to the development of data protection instruments at the UN, including a Guidance Note on Data Privacy, Ethics and Protection of big data to achieve the 2030 Agenda.

Global Pulse and the UN Office of Information and Communication Technology established a UN Data Privacy Policy Group (PPG) in 2016 to work towards a common approach to digital privacy and protection across the UN. The PPG grew in 2017 to include over 25 UN agencies, funds and programmes and held regular meetings.

Global Pulse continued to contribute to the developing space of data privacy and data protection within and outside the UN system, by taking part in various expert forums. Global Pulse is a member of the International Data Responsibility Group (IDRG) and contributed to producing the IDRG’s first annual report, which was launched during the Group’s annual meeting in the Hague. In addition, together with the International Association of Privacy Professionals, Global Pulse hosted a meeting of privacy experts on Building a Strong Data Privacy and Ethics Programme with participation from WFP, UNDP, UNICEF, UNHCR, MasterCard, Nielsen and IBM among others. At the 2017 Internet Governance Forum (IGF) in Geneva, Global Pulse participated in two sessions that explored Privacy in International Humanitarian Action and Implications of Big Data and AI for Building Inclusive Knowledge Societies.

https://www.unglobalpulse.org/data-privacy-advisory-group
https://www.unglobalpulse.org/privacy/tools
**DATA PRIVACY, ETHICS AND PROTECTION**

A guidance note on big data for achievement of the 2030 Agenda

The Guidance Note sets out a general framework on data privacy, data protection and data ethics for the United Nations Development Group concerning the use of big data. It is designed to:

> Establish common principles across UNDG for operational use of big data to support the achievement of the SDGs;
> Serve as a risk-management tool taking into account fundamental human rights; and
> Set principles for quality control as well as access, retention, or other use of data received from private sector.

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1. **LAWFUL, LEGITIMATE AND FAIR USE**
   - Data should be obtained, collected, analysed or otherwise used through lawful, legitimate and fair means, taking into account the interests of those individuals whose data is being used.

2. **PURPOSE SPECIFICATION, USE LIMITATION AND PURPOSE COMPATIBILITY**
   - Any data use must be compatible or otherwise relevant, and not excessive in relation to the purposes for which it was obtained.

3. **RISK MITIGATION AND RISKS, HARMs AND BENEFITS ASSESSMENT**
   - A risks, harms and benefits assessment that accounts for data protection and data privacy as well as ethics of data use should be conducted before a new or substantially changed use of data (including its purpose) is undertaken.

4. **SENSITIVE DATA AND SENSITIVE CONTEXTS**
   - Stricter standards of data protection should be employed while obtaining, accessing, collecting, analysing or otherwise using data on vulnerable populations and persons at risk, children and young people or any other data used in sensitive contexts.

5. **DATA SECURITY**
   - Robust technical and organizational safeguards and procedures should be implemented to ensure data management throughout the data lifecycle and prevent any unauthorized use, disclosure or breach of personal data.

6. **DATA RETENTION AND DATA MINIMIZATION**
   - Data access, analysis or other use should be kept to the minimum amount necessary to fulfill the purpose of data use.

7. **DATA QUALITY**
   - All data-related activities should be designed, carried out, reported and documented with an adequate level of quality and transparency.

8. **OPEN DATA, TRANSPARENCY AND ACCOUNTABILITY**
   - Appropriate governance and accountability mechanisms should be established to monitor compliance with relevant law, including privacy laws and the highest standards of confidentiality, moral and ethical conduct with regard to data use.

9. **DUE DILIGENCE FOR THIRD PARTY COLLABORATORS**
   - Third party collaborators engaging in data use should act in compliance with relevant laws, including privacy laws as well as the highest standards of confidentiality and moral and ethical conduct.

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* This is a modified version of the Note. Complete text can be found at: https://undg.org/wp-content/uploads/2017/11/UNDG_BigData_final_web.pdf
STRENGTHENING THE DATA INNOVATION ECOSYSTEM

INNOVATION CHALLENGES, CONFERENCES AND COMPETITIONS

Data Science Africa 2017

Participants from 60 organizations came together for the Data Science Africa event, which was held in Arusha, Tanzania. Pulse Lab Kampala played a key role in organizing the event, which comprised of a three-day school and a two-day workshop. The Lab organized a session on the radio tool, which it developed to extract relevant data from radio conversations, and hosted several panel discussions. Thanks to growing support and interest, Data Science Africa will continue in 2018 with two separate events in Nyeri, Kenya and Abuja, Nigeria.

Big Ideas Competition: Combating Climate Change

Pulse Lab Jakarta and the Government of the Republic of Korea hosted the Big Ideas Competition under the theme Combating Climate Change. Over 160 proposals were received from applicants throughout ASEAN Member States, Sri Lanka and the Republic of Korea. The competition shortlisted 11 teams, with the grand prize going to a team from Myanmar for an app to monitor and assist with the reduction of methane emissions. The challenge spurred inspiration and facilitated connections between communities of data and technology innovators across the region.
“Data innovation is key to achieving the 2030 Agenda. The Data for Climate Action challenge is a brilliant example of data philanthropy. We must replicate this at global scale and share commitment to use data to address climate change.”

ROBERT C. ORR, SPECIAL ADVISOR TO THE UN SECRETARY-GENERAL ON CLIMATE CHANGE
DATA PHILANTHROPY: FACILITATING PARTNERSHIPS FOR THE PUBLIC GOOD

To ensure that access to insights from big data across many industries is widely available, Global Pulse is working with the private sector to operationalize the concept of data philanthropy, where companies’ data can be safely and responsibly used for sustainable development and humanitarian action.

The Data for Climate Action Challenge advanced the practice of data philanthropy by galvanizing a diverse coalition of companies from different industries and countries. Nine companies contributed anonymized datasets: BBVA, Crimson Hexagon, Earth Networks, Nielsen, Orange, Planet, Plume Labs, Schneider Electric and Waze; and two companies Microsoft and Tableau, contributed tools that assisted teams in deriving their solutions.

“This challenge is just one example of how we can capture, preserve, access and transform all types of data to unlock solutions to help our communities and our planet to thrive.”

DAVE TANG, SENIOR VICE PRESIDENT, CORPORATE MARKETING AND COMMUNICATIONS, WESTERN DIGITAL

ACCELERATING PUBLIC SECTOR ADOPTION

Global Pulse provided technical advice and expertise to UN agencies, hosted 25 workshops, and presented in over 60 conferences, events and international forums. The Pulse Labs engaged with 130 organizations from the UN, academia, and private sector through over 450 briefings and brainstorming sessions. Global Pulse contributed 20 articles as guest posts in national and international media outlets, including a series of WIRED Insider articles featuring the Data for Climate Action challenge. In addition, the Pulse Labs were referenced in over 70 articles in English, Spanish, German and Bahasa Indonesia and in more than 100 academic publications.

EVENT HIGHLIGHTS

Working with Big Data and New Data Sources

Global Pulse and ESRI, an international supplier of GIS software, organized a session at the UN World Data Forum to showcase successful data innovation projects and applications for the advancement of the SDGs. The session gathered more than 130 participants who interacted with data scientists from Global Pulse and ESRI and tested some of the presented projects. Participants also shared ideas and lessons learned from their own organizations and worked to identify the steps needed to jump-start big data innovation projects.
UN Data Innovation Lab

Global Pulse and the World Food Programme hosted the third Data Innovation Lab workshop in Cape Town, South Africa. This workshop is part of the UN Data Innovation Lab series, an initiative established by the UN System Chief Executives Board (CEB) in October 2015. Exploring the theme of data partnerships and data collaboratives, the event gathered participants from 14 UN agencies to engage in discussions around best practices for public-private sector collaborations. Using the NYU GovLabs’ Data Collaboratives Guide - a methodology to identify and structure partnerships to fill data gaps - participants then brainstormed potential partnerships for specific data innovation projects.

Research Dive “Statistics for the SDGs”

Pulse Lab Jakarta hosted a research dive - a hackathon-style event - that brought together researchers and statisticians from Indonesia to analyse data from the Millennium Development Goals (MDGs) in order to support implementation of the SDGs. During the event, the researchers analysed publicly available data on the MDGs across 34 provinces in Indonesia. The teams engaged in lively debates about the best-fit statistical methods and worked to develop insights for proxy indicators for the SDGs, data disaggregation, and data quality and analysis.

Data Science Seminars with Makerere University

Pulse Lab Kampala continued the collaboration with Makerere University’s Artificial Intelligence Research Group (AIR Lab) that specializes in the application of AI and data science to challenges common in the developing world. The Lab and Makerere co-hosted weekly seminars together with the AIR Lab. Once a month, the seminars were held at Pulse Lab Kampala, welcoming 40 enthusiastic students to present and share their research and ideas, and to brainstorm on cutting edge tools and technologies.

Building a Strong Privacy and Data Ethics Programme: From Theory to Practice

Experts in data privacy and data ethics joined Global Pulse and the International Association of Privacy Professionals to discuss best practices in implementing privacy and data ethics in international organizations. The meeting engaged participants in discussions around four topics: managing personal data in organizations; ensuring ethics and human rights approaches in data innovations; employing privacy and data protection principles; and sharing data in humanitarian crises. The meeting featured presentations by expert speakers and data privacy regulators from IBM, Apple, NASA, UN agencies, the International Committee of the Red Cross, MIT, MasterCard and others.
The State of Mobile Data for Social Good

Global Pulse continued to partner with mobile industry leaders like Telefonica, Airtel and Orange on innovation projects and advocacy efforts. Global Pulse joined the advisory panel on Big Data for Social Good, an initiative launched by the GSM Association to leverage mobile operators’ big data capabilities to advance the SDGs. The advisory panel, which includes leading data experts from UN agencies and public sector, provides guidance to the Initiative as well as coordination and integration with the broader ecosystem.

Global Pulse and the GSMA, with support from the Vodafone Americas Foundation, hosted an event in New York that gathered 60 data science and privacy experts, mobile operators and UN agencies. The event celebrated the release of the Mobile Data for Social Good report, a comprehensive study aiming to expand awareness and knowledge of the value of responsibly harnessing mobile phone data to support sustainable development and humanitarian efforts.

The report identifies over 200 projects or studies leveraging mobile data for social good. It surveys the current mobile data landscape, identifies barriers to scale and makes recommendations for the way forward. It also details some of the main challenges with using mobile data for social good and provides a set of actions to spur investment, ensure cohesion of efforts and of customer data privacy and data protection frameworks, and build technical capacity.


Data Playground 2017

UN Global Pulse, Microsoft and the SDG Action Campaign organized the Data Playground during the UN General Assembly, an interactive event that brings together UN, academia and private sector partners to showcase their latest work around innovation for the SDGs. The event attracted participants from Member States gathered for the General Assembly who took part in short presentations on data analytics and innovations in data collection, practical tools and tips for data innovation, and data visualizations.
PARTNERS AND COLLABORATORS

Global Pulse works with a large network of partners and collaborators from government, the UN, academia, think-tanks, companies and grassroots expert networks from around the world. Partnerships include scoping out and developing data innovation mechanisms to support achievement of the SDGs as well as engagement to create frameworks and standards for the responsible and ethical use of big data. Global Pulse and partners also organize workshops and training sessions and produce knowledge sharing products to enable broader public adoption of data innovations for public good.

UN INNOVATION PARTNERS

- Food and Agriculture Organization (FAO)
- International Organizations for Migration (IOM)
- International Labour Organization (ILO)
- Joint United Nations Programme on HIV/AIDS (UNAIDS)
- Operational Satellite Applications Programme (UNOSAT) of the United Nations Institute for Training and Research
- United Nations Capital Development Fund (UNCDF)
- United Nations Children’s Fund (UNICEF)
- UN Country Team Papua New Guinea
- United Nations Department of Economic and Social Affairs (UN DESA)
- United Nations Development Operations Coordination Office (UN DOCO)
- United Nations Development Programme (UNDP)
- United Nations High Commissioner for Refugees (UNHCR)
- United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA)
- United Nations Population Fund (UNFPA)
- United Nations World Food Programme (WFP)
- United Nations Volunteers (UNV)
- World Health Organization (WHO)
- World Food Programme (WFP)
- The World Bank Group
GOVERNMENT PARTNERS

Pulse Lab Kampala:
Ministry of Gender, Labour and Social Development
Ministry of Health of Uganda
National Planning Authority (NPA)
National Water and Sewerage Corporation (NWSC)
Office of the Prime Minister (OPM)
The Government of Zimbabwe

Pulse Lab Jakarta:
Badan Pusat Statistik (BPS)
City Government of Makassar
City Government of Bandung
City Government of Surabaya
Executive Office of the President (Kantor Staf Presiden)
Jakarta Smart City
Indonesian Institute of Statistics
Indonesian Ministry of National Development Planning (BAPPENAS)
Indonesian National Institute of Aeronautics and Space (LAPAN)
Ministry of Trade
Ministry of Science and ICT of the Republic of Korea
Sri Lanka Ministry of Disaster Management

ACADEMIA AND NON-PROFIT ORGANIZATIONS

Bandung Institute of Technology (ITB)
in Indonesia
Bogor Agricultural University (IBP) in Indonesia
Brawijaya University in Indonesia
Center for Strategic and International Studies (CSIS) in the United States
Dedan Kimathi University of Technology in Kenya
Diponegoro University in Indonesia
Gadjah Mada University (UGM) in Indonesia
Harvard University in the United States
Indonesian Institute of Statistics (STIS)
Institute of Resource Governance and Social Change in Indonesia
Makerere University in Uganda
Nelson Mandela African Institute of Science and Technology in Tanzania
Plan International
Politecnica University of Madrid in Spain
Qatar Computing Research Institute (QCRI)
Save the Children
Sepuluh Nopember Institute of Technology (ITS) in Indonesia
University of Edinburgh in the United Kingdom
University of Indonesia
University of Oxford in the United Kingdom
University of Sheffield in the United Kingdom
University of Stellenbosch in South Africa
World Resource Institute

PRIVATE SECTOR COMPANIES AND NETWORKS

Airtel
Africell
BBVA
Crimson Hexagon
DataSift
Digicel Earth Networks
GovInsider
Gyroid
IBM Research Africa
Indonesian Fintech Association (AFTECH)

Kudu
Nielsen
Maldives Housing Development Corporation
Microsoft
OLX Indonesia
Orange
Palladium
Plan
Plume Labs
PT Transportasi Jakarta

Rappler Solidaritas
Schneider Electric
Tableau
Thinvoid
TransJakarta
Twitter
Vodafone Americas
XL Axiata
Waze
Western Digital
DONORS

Australian Department of Foreign Affairs and Trade

Bill and Melinda Gates Foundation

Government of Belgium

Government of The Netherlands

Government of Sweden

William and Flora Hewlett Foundation

United Nations Development Operations Coordination Office