Harnessing innovation to protect the vulnerable

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Pulse Lab Kampala

Project Proposal for Denmark

(December 2012)

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1. Executive Summary

Global Pulse is an innovation initiative of the United Nations Secretary-General harnessing today's new world of digital "big data" for a real-time understanding of human well-being. Through strategic public-private partnerships, innovative analysis and open source technology development across its network of Pulse Labs, Global Pulse is strengthening the international community's capacity to understand what is happening while it is still happening, and to respond with greater agility, precision, and efficiency. Global Pulse is creating new knowledge, technology tools, public-private partnerships, and institutional capacity for:

1. Greater Situational Awareness. More accurate and up-to-date snapshots of the needs and coping mechanisms of vulnerable populations inform better programme design, targeting and implementation.
2. Better Early Warning. Rapid detection of trends, events and anomalies in real-time data allows for earlier responses.
3. Real-time Beneficiary Feedback. Continuous observation of collective beneficiary behavior before, during and after programme implementation allows for rapid, adaptive course correction, real-time impact evaluation, and achievement of results sooner.

Global Pulse is located in the Executive Office of the UN Secretary-General, and is part of the UN Chief Executives Board's nine joint crisis initiatives. Global Pulse is wholly funded by voluntary contributions. Past and current donors include the governments of Australia, Sweden and the United Kingdom, and discussions are ongoing with several other international development agencies and foundations. In addition, in-kind support valued at over US $1 million has been received from the private sector

Global Pulse here proposes to establish Pulse Lab Kampala, an innovation hub for real-time monitoring of wellbeing in Uganda in 2013. Pulse Lab Kampala will allow the Ugandan government and key development organizations to target development resources more rapidly, more effectively, and with greater efficiency.

Arrangements for the establishment of Pulse Lab Kampala were formalized between the UN and the Government of Uganda in 2011. Under the general management of the UN Resident Coordinator, the Lab is anchored in the National Planning Authority of the Ministry of Finance, Planning and Economic Development, in close collaboration with the Office of the Prime Minister, the Bureau of Statistics (UBOS), and the ministries of Finance and Economic Planning, ICT, and Health.

1.1 Budget Summary 2013-2015

Year 1…….USD $752,969
Year 2……...……..USD $999,555
Year 3……...……..USD $999,555
TOTAL PROJECT REQUIREMENTS…….USD $2,752,079

2. Background: Global Pulse

Global Pulse was launched at the height of the economic crisis in 2009, out of the recognition that effective social protection in this new, more dynamic global landscape would require a greater degree of policy agility. The increasing availability of real-time digital data, being generated around the world at ever-increasing volumes, holds tremendous promise for helping detect the early signs of stress on vulnerable populations. It represents an unprecedented opportunity to help detect the early signs of stress and impacts of poverty, hunger and disease on vulnerable populations *as crises unfold*, and get real-time feedback on the effectiveness of policy responses.

Global Pulse functions as an innovation network to mainstream useful innovations for real-time monitoring into development practice. Together with expertise from the UN system, governments, academia, and the private sector, Global Pulse researches, develops, tests and shares new tools and approaches that will allow decision makers to understand what is happening to vulnerable communities *while it is still happening*, and to respond with greater agility, precision and efficiency.

2.1 Development Challenge

The world in which the United Nations operates has changed dramatically in recent years. The industrial and communications revolutions have created a worldwide network, interconnecting our economies, institutions and societies in ways so complex they defy predictive analysis. Policymakers today are confronting a volatile and dynamic landscape in which economic crises, social change and political instability emerge without warning, reverberate around the globe, and impact vulnerable populations almost with the speed of natural disasters.

The global community is struggling to adapt to a world in which the pace of chance continues to accelerate. As the past several years of economic turmoil have demonstrated, progress toward the Millennium Development Goals is not a linear process: today's compound, complex and fast-moving crises may drive development in reverse, erasing years of gains in a matter of months.

At a time when our need for agility and rapid response has never been greater, our traditional twentieth century tools for tracking development are no longer up to the task. Surveys are time-consuming and costly to implement on a wide scale. National statistics may be years out of date by the time they are published. Too often, by the time we understand what is happening at the household level, it has already happened, and the harm is done.

The irony is, at the same time that policy makers are struggling to obtain actionable information, we are actually swimming in an ocean of real-time digital data. Global Pulse is today actively

building the toolkit that will harness Big Data to keep policy makers and development practitioners ahead of the curve.

2.2 Big Data for Development

With the global explosion in mobile phone coverage, the digital divide is closing faster than anticipated. Communities around the world are now accessing digital services for information, financial transactions, and social networking. As they do so, they are generating vast amounts of digital data – so much so that the common term for it is "Big Data." By some estimates, more than 90% of all the data that exists today was created in the past two years alone. This data comes from everywhere: from how people communicate, share their lives on social networks, search for information, and transact business. Most of this data is being generated at no cost, in real-time, merely as a bi-product of people going about their daily lives.

Over the past few years, a lucrative industry has grown around the business of analyzing digital data for a real-time understanding of customer needs and identification of emerging market trends. Companies are using powerful computer networks and sophisticated data mining techniques to analyze streams of data with the goal of providing decision makers with a highly accurate awareness of operations at any given moment and close-to real-time feedback on the effects of specific actions.

While the private sector routinely analyses this ocean of digital information in real-time, the public sector has barely begun to come to terms with the potential of this new "unnatural resource." Recent research by Global Pulse and others has shown that analysis of Big Data may be used to reveal when people are falling victim to disease outbreaks, migrating away from crisis-affected areas, losing jobs, or struggling to afford food, energy, and shelter.

Big data holds enormous promise to improve our understanding of how populations are impacted by regional and global shocks and will allow development practitioners to monitor their programs and policies in real-time for strengthening long-term development outcomes. The time has come for the United Nations to take a leadership role in re-purposing these remarkable innovations from the private sector to transform big data into a global public good, and to ensure that privacy and human rights are fully protected at every step of the journey.

2.3 Sources of Big Data

A. **Data Exhaust (Services as Sensors):** As populations increasingly adopt and use new technologies – particularly mobiles phones and services provided over mobile - they generate ambient data as by-products of their everyday activities (or 'data exhaust'). This category also includes several relevant data sources from UN programmes including operational data critical to the way programmes function (e.g. drug or food stock levels,

school attendance); records of how people access services; and needs assessments, rapid surveys, or focus group discussions used to design or implement programmes.

B. **Online Information: News, Social Media, e-Commerce, etc.:** Digital content is growing exponentially and the ability to mine this content provides a real-time data collection opportunity. Much of the content of press agencies and other traditional media outlets is publicly available online and in databases, making it possible to scope local perspectives instantaneously. Furthermore, social media, local radio station online forums and general discussion forums or e-commerce sites can give real-time snapshots of what a community is experiencing. Data mining methodologies allow for identifying trending topics (e.g., keyword searches) and uncovering information about a population's preoccupations through social media (e.g.,Twitter).

C. **Citizen Reporting:** Information is increasingly being provided directly by citizens, through a variety of mediums and crowdsourcing techniques. Open-source platforms like Ushahidi, uReport, and uSpeak, as well as Voice/IVR and SMS feedback tools all make it possible to listen to citizen voices in real time.

D. **Physical Sensors:** Another experimental type of new data focuses on the impact of changes in human behavior on the physical environment. These can be assessed through a variety of existing methodologies, from real time monitoring of water quality with dedicated sensors to satellite imagery.

2.4 Public-Private Partnerships for Digital Development

To harness this opportunity, new types of partnerships are needed between governments, development organizations, and the private sector to ensure that real-time digital information directly benefits the communities who generate it. Global Pulse has established partnerships with private sector and academic organizations that have the analytical tools and capacity to repurpose Big Data for Development. The project has assembled the technical talent, the analytical skills and the managerial competencies to carry out information technology projects, to contract for relevant technical services and to act as a match-maker between funding agencies, public sector bodies, development organizations, and service providers.

Finally, there is a key role for the UN in reframing the data privacy discussion around the notion of Big Data as a public good. The primary challenge to adapting private-sector data for public policy has been data privacy, an issue that is constantly evolving in the digital age. Global Pulse has been able to communicate the opportunity-cost of not finding a way to leverage Big Data for the public good to some key audiences and has begun engaging with the private sector around the concept of "*Data Philanthropy*." What is now needed is a broad and direct public

engagement around the development of nuanced and responsible data sharing and privacy frameworks.

2.5 Big Data, Privacy, and Human Rights

With new data must come new approaches and frameworks for protecting individual privacy. Big data has brought with it a tremendous opportunity to strengthen develop, but it has also increased risks to data privacy: disparate data sets can be combined in ways that make it possible to re-identify individuals from supposedly anonymized data.

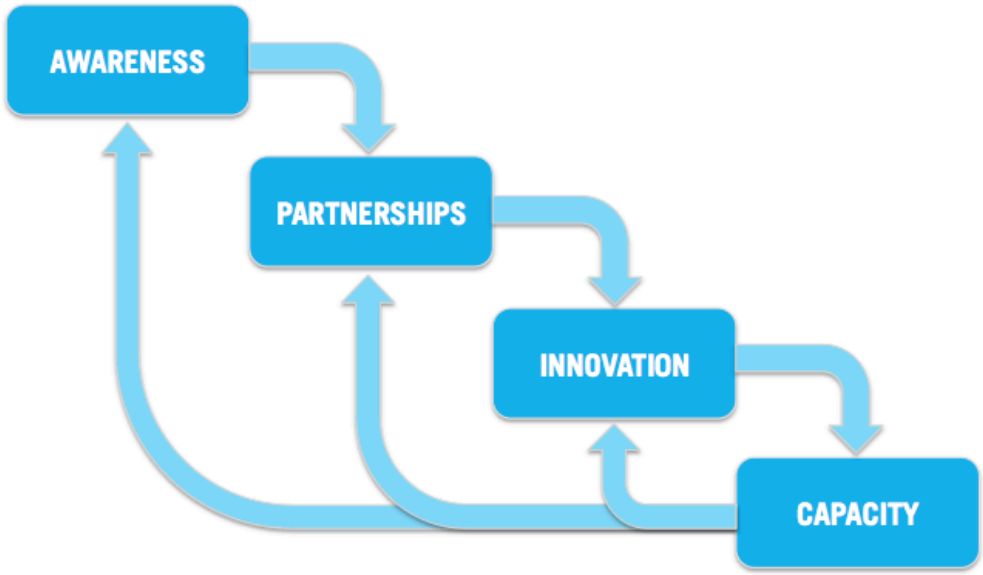
Today, public discourse about privacy in Big Data is becoming increasingly polarized. On one side, competitive forces in the private sector causing firms to push the envelope ever further on what information they are able to collect—and infer—about their customers. On the other side, regulatory bodies in the public sector are responding by implementing sweeping measures that categorically restrict the reuse of personal data for purposes other than that for which it was collected.

Global Pulse seeks to insert a third "pole" into this debate: Big Data should be recognized as a raw public good, an "unnatural resource" which the global community must learn to refine into actionable information and apply in ways that could have a transformative impact on outcomes for millions of people around the world. At the same time, Global Pulse has consistently argued that safe and responsible use of Big Data must ultimately be viewed in a human rights context, as the risk of re-identification through misuse of Big Data could open the door to discrimination.

In consultation with privacy experts, and building on existing models such as recent work in health data privacy, Global Pulse is pursuing a similar methodology: Global Pulse has today developed the first set of data protection guidelines for how to apply Big Data safely and responsibly. These guidelines are now being adapted to specific country contexts for Pulse Lab staff, research partners, and others wishing to conduct similar work.

3. Global Pulse Model for Change

To achieve its ambitious goals, Global Pulse has developed a feedback-driven model for change that both catalyzes innovation in the use of Big Data for Development and drives broad adoption of proven solutions into relevant organizations and communities of practice.



According to this model, thought leadership promotes **awareness** of the opportunity presented by Big Data for global development. Growing public awareness among researchers and leading players in the technology sector facilitates the formation of public/private **partnerships** that enable access to the data, technologies, and human expertise required to support ongoing research and development. R&D projects within and across the Pulse Lab Network yield a steady stream of technological and methodological **innovations** in harnessing Big Data for development. Field-based piloting and evaluation of this growing real-time monitoring toolkit with development partners, in combination with concerted efforts to support at-scale implementation, contribute to local and national **capacity** for enhanced decision making.

As implementation advances, reinforcing feedback loops accelerate adoption across a growing ecosystem:

- Practitioner and community feedback through Pulse Labs supports agile, iterative improvements to earlier innovations as well as discovery of requirements for future innovations.
- Shared learning and expanding adoption of data mining and real-time analytics for development across regions, sectors, and disciplines creates incentives for deeper collaboration within and between communities of practice, and serves to attract new partners into the network.
- Mounting evidence of the impact resulting from broad usage drives serves to expand awareness of the opportunity cost of failing to adopt new approaches, while a growing base of open real-time big data, analytical expertise, open source technologies, partnership models and compelling case studies remove obstacles to adoption.
- Proven methodologies, technology tools, data sources, partnership-models, lab innovation models, and knowledge gained during implementation are shared widely.

Once the capacity of the Pulse Lab Network reaches critical mass, the role of Global Pulse becomes superfluous. Pulse Lab functions will be entirely assimilated into national institutions, while ongoing innovation and knowledge sharing are sustained by communities of practice supported by a thriving ecosystem of local, national and global public/ private partnerships contributing to a real-time big data commons.

3.1 Country-Level Pulse Labs

The only way to test innovative ideas and research to address complex development challenges is through actual implementation. That is why the backbone of the Global Pulse initiative is its network of country-level Pulse Labs, which employ a build-to-learn approach.

Pulse Labs are physical centers of innovation and R&D that bring together government, the UN and local partners in academia and the private sector to test, refine and scale solutions that use real-time big data to support development goals.

Crucial to the success of Pulse Labs is having government and local expertise involved in their creation and management.

3.2 Pulse Lab Benefits

i. Gain access to new sources of real-time information and the tools needed for their analysis;
ii. Develop local capacity within government and the UN to understand and use new data-sources and technologies;
iii. Demonstrate regional and global leadership in data-driven innovation;
iv. Strengthen local and global opportunities through creating mutually beneficial partnerships between government, academia, the private sector, the UN and local technology and innovation communities within the host country.
v. Explore the use of real time data and analysis techniques to support government and UN initiatives.

3.3 Key Principles of a Pulse Lab:

i. Pulse Labs draw both on the regional expertise of host countries as well as the international work of UN agencies.
ii. The locations of Pulse Labs have not been pre-determined. Instead, governments that are interested in playing a leadership role in innovation for development - as have Uganda and Indonesia - may express their interest in being a prototyping country.
iii. Pulse Labs are different in every country because they are be designed in a way that best serves a country's specific needs and priorities.
iv. Each Pulse Lab contributes their research with other labs in the network.
v. Pulse Labs are research and development facilities where technologies and analysis techniques will be tested rapidly and iteratively and where teams can learn from each other's successes, but also their failures.
vi. Pulse Labs derive their value from being collaborative and multi-disciplinary, as this allows government to access diverse and new sets of expertise. This includes collaborating with local technology experts, academia and data providers, but also with the other Labs in the Global Pulse network and a global set of academics and

entrepreneurs.

Following the model of Pulse Lab New York, Pulse Lab Jakarta formally opened in Indonesia on 1 October 2012.

Global Pulse here proposes to establish a third Pulse Lab in Kampala, Uganda in 2013.

4. Rationale for Pulse Lab Kampala

Uganda today has one of the youngest and fastest-growing populations on the African continent. Uganda's population has more than doubled since 1986 to about 35 million people currently. According to a 2008 World Bank report, Uganda currently holds the youngest population in the world, just behind Niger. Uganda's government introduced universal primary education (UPE) in 1997, and later universal secondary education (USE). Under the UPE and USE policies, the government provides free education for pupils and students at public schools. According to The Mail and Guardian, Uganda's universities and tertiary institutions produce 400 000 graduates to compete for 90,000 jobs, creating an annual deficit of somewhere around 310,000 jobs. Youth unemployment in the country is currently estimated at 83%.

To address the challenges posed by youth unemployment in Uganda, the government is focusing considerable resources focused on schemes such as the Youth Venture Capital Fund to support entrepreneurial bankable ideas and initiatives, and the national Business, Technical and Vocational Education and Training (BTVET) programme.

In 2011, the Ugandan economy declined from a gross domestic product (GDP) growth of over 6% the previous year to 4.1%, according to African Outlook. Over the course of the year, inflation averaged a high 18.8%, up from 4.1%. For 2012, GDP growth is expected to be between 4.5% and 4.9%, mainly due to a growing oil sector. According to the African Outlook, the government is expected to rein in the growth in expenditures, but The Outlook notes that "slower revenue collections brought about by the slowdown of economic activity are likely to offset any improvements on the fiscal balance."

According to a recent report from IFAD, Uganda has made significant progress in reducing poverty, slashing the countrywide poverty rate from 56% of the population in 1992 to 24.5 per cent in 2009. The reduction of poverty in urban areas has been especially marked. Notwithstanding these gains, however, the absolute number of poor people has increased due to explosive population growth. Poverty remains firmly entrenched in rural areas, home to 87% of Ugandans. About 30% of rural citizens – some 10 million men, women and children – live below the national rural poverty line.

The poorest regions are the north and north-east of the country, where there are also frequent incidences of political conflict. These are fragile, dry and sub-humid regions where the extreme

variability of rainfall and soil fertility means that farming presents a challenge. Here, household-level production often falls short of minimum household needs, rendering families particularly vulnerable to food insecurity. Health and social issues have a significant impact on rural poverty in Uganda as well. The population is growing at an annual rate of 3.2%. Although the country has been able to dramatically reduce the incidence of HIV/AIDS among the population, the pandemic has caused the death of large numbers of young adults and orphaned 1.2 million children.

4.1 Opportunities for a Ugandan Pulse Lab

Following the launch of Pulse Lab Jakarta, Uganda is a natural fit for a Pulse Lab in East Africa. Across Uganda, technology is increasingly viewed as having potential for promoting economic growth, political participation, transparency and accountability. The growth of mobile phone use in Uganda has made it an ideal test case for the application of such technologies. The number of mobile telecom subscribers jumped from just under 13 million in December 2010 to over 16 million in August 2012. Just since early 2011, the number of mobile subscribers increased by 25 percent. The way in which Ugandans use their mobile phones is also changing; in August 2012, for example, the Daily Monitor reported that in 2012, 3.6 million mobile subscribers used mobile banking services.

With its young and increasingly mobile population, economic and employment pressures, modest growth with a growing mobile and technology sector, food insecurity amidst rich natural resources, international interest and a concomitant plethora of projects in the health and agriculture sectors as well as an uncertain political environment, Pulse Lab Kampala has its work cut out for it, but is also ideally situated as a test bed for UN Global Pulse's work at the local level, and the Ugandan government is prepared to establish a Pulse Lab in Kampala.

5. Pulse Lab Kampala Research and Development

Pulse Labs Kampala will be a research and development hub that benefits from a rapid prototyping approach to innovation. Quickly generating and testing tools will the Lab to learn rapidly from both successes and failures and move adapt with agility to the changing world of big data and data analytics. Pulse Lab Kampala will focus on fundamental research frameworks and methodologies. This includes answering the following questions:

i. What is the right approach for accessing data and forming partnerships with the private sector? How does the Lab ensure that this is done in a way that respects privacy?
ii. What types of data mining technologies and techniques are the most suitable for this type of research?
iii. What are the appropriate data science research methodologies?
iv. How can tools and techniques be developed through the Lab that are adaptable to a country’s needs as well as sector-specific goals?

5.1 Innovation Methodology

Pulse Lab Kampala at the most basic level implements an innovation-as-a-service model with a sustainable cost-sharing approach. The process depends upon both a steady supply of data, tools and human expertise, and steady demand on the part of a client base of UN agencies, national institutions, and partners with programme and policy challenges they hope to address through analysis of Big Data.

i. Pulse Lab Kampala will forge strategic public private partnerships to secure access to sources of Big Data, state-of-the-art analytical tools, and expert advisors in the relevant technical fields.
ii. In close collaboration with development partners, Pulse Lab Kampala will design and conduct research to evaluate the potential of digital data sources and analytical methodologies for generating actionable insights and real-time information. [1]
iii. If statistically robust correlations are discovered, suggesting the potential of a given approach to predict or serve as a real-time proxy indicator of changes in wellbeing, Pulse Lab Kampala will work with technology partners to implement the approach in a free and open source software tool for real-time monitoring.
iv. This new tool and the real-time information it generates will then be piloted in an existing programme or policy initiative that already has performance metrics in place.
v. Upon rigorous evaluation, if the tool is found to have contributed significantly to improving effectiveness, efficiency, or measurability, Pulse Lab Kampala will support relevant implementations partners in successfully adopting the tool into practice, while also openly sharing new knowledge and the technology itself with the global community.

For these goals to be achieved, a research director and a lead data engineer will be appointed.

5.2 Project Teams

Pulse Lab Kampala will have a minimum of two or three projects underway at any one time. Teams of three to four people, (who are supported by directors and auxiliary staff), will work on a specific problem set, research methodology, tool or pilot and will be expected to share their successes and failures internally and through academic publications.

In addition, Pulse Lab Kampala research teams are required to present their work to the general

[1] This research typically takes the form of retrospective analysis, in which archives of anonymized digital data (e.g., mobile phone calling patterns, money transfers, online search, posts on social media, use of health and agricultural hotlines, etc.) are compared to verified statistical evidence of what happened to that population during that time period (e.g., food prices, crop failures, disease outbreaks, employment rates, rainfall, natural disasters, etc.)

public - either online or in person - to help distill ideas and communicate the relevance of the research to a wide audience. Public presentations led by the research team, should occur once every six-months and can be aligned with conferences, exhibitions, hackathons, webinars or online forums.

5.3 Project Length

Rapid prototyping and testing will be key to Pulse Lab Kampala's success. Projects (whether they are centered around foundational research, the development of tools or techniques, or a global pilot), will be structured around short innovation cycles. The suggested cycle time is 6-months with a caveat that an innovation cycle should only start after data for the project has been acquired.

5.4 Incremental vs. Anticipatory Research

Wherever possible, Pulse Lab Kampala will utilize existing research, companies and best practices. However, creating an incremental improvement to an existing tool will often not suffice. Teams will seek to anticipate the opportunities that data and mobile technologies will bring - five and even ten years from now. They will then translate their future-oriented visions into a tangible prototype for today.

5.5 Minimum Viable Products

Pulse Lab Kampala's toolkit development will be based upon a Minimum Viable Products (MVP) design process. A Minimum Viable Product has just those features that allow a method, a tool, a technique or a pilot to be tested, and no more. For example, a tool that is designed to be an early warning system as well as a long-term monitoring system would be considered a multi-feature product. Project teams will consider perfecting one feature at a time. Creating and then testing an MVP allows a project team to collect the maximum amount of validated learning from their user-base without spending time and money developing solutions in an isolated lab environment. Once an initial MVP has been tested and adjusted based on user feedback, the next iteration of testing can take place. It is only once a single feature operates effectively, that the next feature will be added. Ultimately, creating MVP's is a process of idea generation, prototyping, presentation, data collection, analysis and learning which prioritizes testing and feedback.

5.6 Partnership Plan

In 2011, UN Global Pulse conducted extensive scoping research in Uganda on the feasibility of a Kampala Pulse Lab. As part of this research, there was considerable exploration of potential key and core partners, including private, public, academic and NGO partners. Since then, there have been some substantive changes in the readiness of certain partners to engage with Pulse Lab Kampala due to staff and other organizational changes. At the same time, new partners have emerged that have the potential to be strong core partners, once funding and operations have been secured for Pulse Lab Kampala. Based on current information, core partners should include:

- The Uganda Ministry of Information Communication Technology
- Uganda Communications Commission
- The National Information Technology Authority
- DANIDA Uganda
- UNICEF Uganda
- Faculty of Computing & Information Technology - Makerere University
- MTN Uganda
- Agency for Technical Cooperation & Development
- World Food Programme
- World Health Organization
- OCHA
- Google
- Local technology and innovation hubs

Partner agreements and detailed roles and responsibility matrixes will be developed once the Lab is operational, but it is already clear that there is a core cadre of motivated and dedicated senior leaders in these institutions and organizations that see the value of real-time data analysis and tools for their work, and are willing and able to meaningfully contribute.

Uganda already has, in fact, a plethora of projects today generating real-time data. These include, for instance, UNICEF systems that are monitoring vulnerability at the community level; a disease and drug tracking SMS system pioneered by FIND Diagnostics and the Earth Institute; and FEWSNET's regional famine early warning system. Additionally, there are numerous m-health projects generating real-time data on medical supplies and stock-outs for public health facilities, community-based projects that are conducting surveys and polls in real-time with citizens, as well as projects that utilize on-the-ground community knowledge workers providing valuable survey data (such as those of the Grameen App Lab Community Knowledge Workers).

Finally, there are the large commercial entities such as the mobile operators who are generating an enormous amount of transactional "big data" on mobile banking services, relocation, and mobile airtime transactions, to name just a few. Pulse Lab Kampala will reach out to key data partners and make the case that providing real-time access to big data for analysis and aggregation will add value to their respective operations.

6. Programme Implementation Plan

Pulse Lab Kampala's implementation plan will occur in two phases; these work plans are described in detail in Section 9.

- *Phase I* will focus on solidifying relationships with key partners and data sources, operational readiness, and an initial set of research projects in Uganda that will analyze available data sets retroactively according to specific indicators. Phase 1 will take 10-12 months.
- *Phase II* will focus on real-time data analysis, new tool development, and aggressive partner outreach and training to then scale operations and mainstream them into the relevant institutions. This phase is expected to be between 18-24 months.

6.1 Staffing Plan

For Phase I, a small core staff will be established for Year 1 of operations of Pulse Lab Kampala to ramp up a presence in the country, recruit core Year 1 partners for the Lab, and engage in prototype research activities. Core staffing in Year 1 will include the following staff roles:

- Head of Lab (full-time staff)
- Operations Manager (staff, part-time)
- Senior Partnership Coordinator (staff, full-time)
- Chief of Technology (staff, full-time)
- 2 Software Developers (staff, full-time and part-time)
- Research Analyst (staff, full-time)

For Phase II, staffing will shift from start-up/establishment of the Lab to ongoing support of core partners and development of analytical tools/software. While ongoing partnership will remain important, increased training and technical development will be key in years 2 and 3 for the Lab to succeed. Staffing will, concomitantly, shift slightly to include the following staff roles:

- Head of Lab (full-time staff)
- Operations Manager (staff, part-time)
- Partnership Coordinator (contract, part-time)
- Chief of Technology (staff, full-time)
- 4 Software Developers (staff and contract, full-time and part-time)
- 2 Research Analysts (staff, full-time)
- Training and Knowledge Management Coordinator (staff, full-time)

6.2 Physical Facilities

As outlined in the Pulse Lab Kampala proposal, it will be important to establish the right kind of physical facilities that meet the following characteristics:

- Conveniently located near major core partners/downtown area or near Makerere University;
- Ideally, located in one of the Hubs to take advantage of a collaborative and tech-savvy environment that lends itself to close collaboration without being perceived as too aligned with any particular core partner;

- If co-located with a core partner organization becomes necessary, it will be important to structure the physical facilities as such to not be perceived to be too closely (i.e. in an innovation center of a core partner, or separate facility, even if core partner-owned);
- Has high-speed internet, online conferencing, and ideally, event space for technology events readily available;
- Has private meeting space available for partner meetings and private consultations;
- Is professional and presentable in location and decor for high-level visitors while at the same time connoting technology innovation and vibrant activity.

6.3 Governance Structure

UN Global Pulse

- The UN Deputy Secretary-General chairs a senior-level Global Pulse Steering Group that meets at least twice a year to review project progress and make decision on critical issues. The project receives technical guidance from the Director of the United Nations Statistics Division and the United Nations Chief Information and Technology Officer. Global Pulse regularly briefs the UN General Assembly to ensure that the project maintains a strong base of Member State support.
- At the global level, the Government of Switzerland chairs a "Friends of Global Pulse" steering committee, comprising 13 UN Member States, which provides guidance to the project. A Technical Advisory Group (TAG) representing 15 UN agencies ensures that the project adds value to ongoing impact monitoring efforts and on priorities and implementation strategies.

Pulse Lab Kampala

- A similar two-tier governance structure guides country level implementation. Pulse Lab Kampala will have a national Technical Advisory Committee representing research partners while a high-level advisory body comprising Government, Donors and the UN Country Team will provide strategic guidance. A 'Friends of Pulse Lab Kampala' comprising in-country donors will provide political guidance to the Lab.
- As part of the Steering Committee the UN Country Team will ensure the Lab's research agenda is in line with the Uganda UNDAF 2010-2014 and National Development Plan (NDP) objectives. Pulse Lab Kampala is expected to contribute to the UN's "Delivering as One" approach to strengthen the capacity of local government to measure development effectiveness and attainment of MDGs, and analyze and use evidence, including through new technology. The Lab will also contribute to the UNDAF goal of enhancing the capacities of the public sector to generate, analyze and disseminate information.
- Led by the UN Resident Coordinator, the Country Team will facilitate the inclusion of learning from the Pulse Lab into the ongoing activities of the UN and facilitate, as necessary, joint programming between Global Pulse and other UN initiatives.

6.4. Management Structure

As a UN inter-agency initiative, Pulse Lab Kampala is under the general management of the Resident Coordinator, with delegated authority from the UN Deputy Secretary-General. It is expected that Lab staff will include secondments from UN agencies, creating strong sectoral expertise and linkages to operational agencies. The Pulse Lab Kampala Manager will maintain an administrative working relationship with the UN Resident Coordinator's office and a substantive reporting line to Global Pulse headquarters in New York for direction on analytical research and technology development.

7. Project Risks

As with any high profile and entrepreneurial project that is breaking new ground, there are risks associated with Pulse Lab Kampala; mitigation strategies will need to be developed to lower potential risks and increase the likelihood of success for Pulse Lab Kampala. There are a number of potential risks that pertain to establishing operations and core partners. These include:

7.1. Partnerships

- Potential partners are receptive the goals and mission of PL Kampala. Core potential partners, by and large, see concrete value in the work of Global Pulse. In Phase I, these potential partners need to be actively and aggressively re-engaged to convert the initial conversations into more formal partnerships.
- Partners will have to have a clear sense of the specific roles and responsibilities in their relationship with Pulse Lab Kampala and a clear understanding of the value-add of the relationship. This approach need to be codified in formal MOUs to manage expectations and strategic and operational value to the partners.

7.2. Data Access

Getting access to data will depend on partners perceiving value in sharing and providing data (that, in many instances, organizations holding close for their competitive advantage). For some organisations, there will be confidentiality considerations (especially for health data), and commercial organisations might be reluctant to sharing data due to commercial competitive sensitivities. It is important that Pulse Lab Kampala provides a clear value proposition for individual organisations that become data partners.

Commercial organisations are very focused on partnerships that help directly support their business, either through additional revenue or cost savings. It is important to show how a partnership with Pulse Lab Kampala will provide direct business benefits. For instance, this could take the form of business intelligence that would enable commercial partners to develop and market value-added services (especially true for the MNOs who are keen on better

understanding their customers in a highly competitive environment), or market research on use and uptake of specific products.

Government agencies see the UN as an organisation that can help either reduce their workload or provide expertise or funding that can help them more easily meet their objectives. It's important for Pulse Lab Kampala to understand the inner workings of ministries and specific departments to ensure that the PL Kampala value proposition is closely aligned to the key issues that the organisation is facing.

Pulse Lab Kampala will broker strategic data partnerships with the private sector and academia based on the following assumptions:

- Experience has shown that on average, it takes three months to broker data partnerships with private companies and between 1 week and 1 month to ready the data for research.
- The private sector is often searching for the following outcomes:
  - A new tool or data analysis method;
  - Marketing or event opportunities;
  - Data visualizations;
  - Insight into their customers
- The private sector is often less interested in academic papers and publishing. For academia, the opposite holds true.

Given these concerns, a Data Privacy Officer and a Partnerships Coordinator will be recruited.

7.3. Communications and Positioning

Pulse Lab Kampala must not be perceived as disproportionately associated with any one UN agency. The support of UNICEF, for example, has been and will remain critical to the success of Pulse Lab Kampala, given UNICEF's expertise, resources, data, and network of local partners; at the same time, both Pulse Lab Kampala and the Office of the UN Resident Coordinator must consistently demonstrate a comparable level of open engagement with other UN agencies interested in collaborating with the Pulse Lab. Given the non-sector-specific nature of the data sources Global Pulse analyzes, it is anticipated that Pulse Lab Kampala will serve as a catalyst for Delivering As One approaches to interagency programming; this dynamic has already been observed in the UN Country Team regarding Pulse Lab Jakarta.

The theme of neutrality will become especially important when choosing a location for the Lab as a physical space can easily connote special affiliation. Ideally, Pulse Lab Kampala is situated near core and key strategic partners but not housed within a specific entity – neither a UN agency nor a national institution. There are a number of local Ugandan innovation hubs (such as the Outbox, for instance) that may be possible locations for an initial Lab space.

Pulse Lab Kampala will need to take care to demonstrate concretely its value added rather than competing with or duplicating existing work; it must provide value through additional insight or tools for core partners that lead directly to greater effectiveness, efficiency, and/or measurability of existing initiatives.

7.4. Sustainability

Previous work was stalled for lack of funding to formally establish the Lab. Given the current funding environment and influx of money into Uganda for civil society organizations (partially due to some donors withdrawing from direct budget support), securing future resources to ensure sustainability should be comparatively easy at this point, but funding constraints will persist. Pulse Lab Kampala will need to carefully plan and budget for measured expansion throughout Phase 1 to expand and scale in Phase 2 but to gradually mainstream its work into agencies and institutions in year 2. Sufficient time needs to be allocated for fundraising and slow funding timelines to ensure continuity of operations. This will mean ongoing attention to potential funding sources, clear communications and fundraising coordination with other local initiatives similar to Pulse Labs, and careful and smart budgeting.

7.5 Data Protection and Privacy

Pulse Lab Uganda will have a key opportunity in regard to developing data protection and privacy guidelines in Uganda. To this date, no clear legal and technological data privacy frameworks exist in Uganda. A review of relevant documents from authorities that govern communication technology in Uganda, such as the Uganda Communications Commission (UCC), the Ministry of Information and Communications Technology (ICT), and the Uganda Bureau of Statistics (UBOS), reveals that policies on data privacy and security have not been clearly formulated. Pulse Lab Kampala, in conjunction with core partners such as UBOS, for instance, have an opportunity to develop clear and widely-promoted guidelines to de-identify and anonymize data used by the Pulse Lab.

The Uganda Bureau of Statistics Act of 1998 describes Ugandan government policy on data collected by the Uganda Bureau of Statistics (UBOS). Absent from the Act are guidelines on how non-governmental entities collect and disseminate data. Additionally, the Act does not discuss what "Personally Identifiable Information" (commonly referred to as PII) is in the Ugandan context. The only close reference is the "removal of identifiers" before data is granted to researchers [Uganda Bureau of Statistics, 1998] but the definition of the term "identifiers" is ambiguous.

Pulse Lab Kampala, as a first order of business and together with its advisory board, will develop a set of clear guidelines for data privacy and security that will integrate state-of-the-art privacy enhancing techniques (such as k-anonymity combined with tactics such as differential privacy

hybrid techniques, and noise addition, for instance) and data security standards for storing and publishing its datasets. The specific techniques and algorithms that Pulse Lab Kampala will develop, publish, and use for its research projects are beyond the scope of this proposal but Pulse Lab Kampala will build on existing data protection research and publish, in consultation with partners and relevant regulatory bodies, its stringent privacy guidelines in details well in advance of engaging in its first-year research projects, serving as a model in Uganda on this topic.

8. Budget (36 months)

	2013	2014	2015
Strategic Track 1: Research and Development			
Data Access, Analysis & Technical Research Partnerships	$140,350	$200,500	$200,500
Subtotal Track 1	$140,350	$200,500	$200,500
Strategic Track 2: Technology Toolkit			
Technology Design	$75,000	$75,000	$75,000
Tool Development	$150,000	$200,000	$200,000
Events (Competitions, code sprints, geek meets, conferences, etc.)	$25,000	$35,000	$35,000
Knowledge Sharing (including printed and online publications)	$15,000	$25,000	$25,000
Subtotal Track 2	$265,000	$335,000	$335,000
Strategic Track 3: Big Data for Development			
Programme Management (including Data Privacy Protection)	$140,000	$205,000	$205,000
Staff & Partner Capacity Development (analytical & technical)	$30,000	$40,000	$40,000
Travel (local & regional)	$28,000	$39,000	$39,000
Recurrent expenditure (office facilities)	$75,000	$81,000	$81,000
Subtotal Track 3	$273,000	$365,000	$365,000
Total Direct Operational Costs	***$678,350***	***$900,500***	***$900,500***
Project Support Costs			
UN Project Support Costs (11%)	$74,619	$99,055	$99,055
Subtotal PSC	$74,619	$99,055	$99,055
ANNUAL BUDGET (required)	**$752,969**	**$999,555**	**$999,555**
BIENNIAL TOTAL BUDGET			**$2,752,079**

* Figures rounded up.

** Conservative budget excluding possible partner contributions of office space, staff, etc.

9. **Work Plans**

PHASE I

January 2013 – December 2013

EXPECTED OUTPUTS	PLANNED ACTIVITIES	TIMEFRAME												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Output 1														
MOU between Governmentof Uganda and UN	Government counterpart nominated	x	x											
	Facilitate exchange of letters formalizing research collaboration with national institutions	x	x	x										
	In consultation with UN Country Team, establish a multi-partner trust fund for Pulse Lab Kampala.	x	x	x										
	Negotiate MOU between Government and UN			x										
Output 2														
Launch of Pulse Lab Kampala	Funding secured for Phase 1	x	x											
	Phase 1 staff hired			x										
	Physical facility secured & equipped	x	x											
	Public Launch Event				x									
Output 3														
Public-Private Research Partnerships	Negotiate data-sharing agreements with Ugandan mobile phone carriers for access to sets of historical data		x	x	x	x	x							
	Negotiate data-sharing agreements with 3 priority private-sector firms			x	x	x	x							
	Negotiate research arrangement with Makerere University Department of Computer Science		x	x										
	Negotiate data collection partnerships with private-sector market research firms				x	x	x							
Output 4														
Real-time monitoring opportunites identified though data mining research	Identify Phase 1 research priorities		x	x										
	Finalize Phase 1 research project proposals			x	x									
	Finalize Phase 1 research workplan				x									
	Conduct research on mobile phone data				x	x	x	x	x	x	x			
	Identify correlations with high potential as new indicators							x	x	x	x			
	Conduct research on other data sources					x	x	x	x	x	x	x	x	
	Identify correlations with high potential as new indicators								x	x	x			
	Research findings published												x	
Output 5														
Real-time monitoring tools developed	Design of open source monitoring tools and dashboards based on research findings				x	x								
	Development of monitoring tools						x	x	x	x	x			
	Functional testing of monitoring tools											x	x	
Output 6														
Local engagement and capacity development	Conduct regular codejams/hackathons in conjuntion with local innovation hubs and Makerere University to support technology development and test ideas				x	x	x	x	x	x	x	x	x	
	Provide regular briefings to local public sector on big data opportunities, research findings, new tools, and policy implications				x	x	x	x	x	x	x	x	x	
Output 7														
Phase 2 Planning	Global fundraising for Lab for Phase 2	x	x	x	x	x	x	x	x	x	x	x	x	
	Phase 2 partners identified and recruited							x	x	x	x	x	x	
	Additional partners identified and onboarded with formal MOU										x	x	x	
	Identify Phase 2 research priorities											x	x	
	Identify potential partners for Phase 2 pilot projects										x	x	x	

PHASE II

January 2014 – December 2015

EXPECTED OUTPUTS	PLANNED ACTIVITIES	TIMEFRAME 2014												TIMEFRAME											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1																									
Public-Private Research Partnerships	Negotiate agreements with Ugandan mobile phone carriers for access to real-time data	x	x	x																					
	Negotiate data-sharing agreements with 10 priority private-sector firms			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
	Negotiate research arrangement with Ugandan and regional research institutions			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
	Review and expand data collection partnerships with private-sector market research firms			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
Output 2																									
Real-time monitoring opportunites identified though data mining research	Finalize Phase 2 research project proposals			x	x																				
	Finalize Phase 2 research workplan				x																				
	Conduct research on relevant data sources					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
	Identify correlations with high potential as new indicators								x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	Research findings published										x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Output 3																									
Real-time monitoring tools developed	Design of open source monitoring tools and dashboards based on research findings				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
	Development of monitoring tools						x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	Functional testing of monitoring tools									x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Output 4																									
Evidence of impact	Negotiate agreements with partners willing and able to support pilot studies of real-time monitoring tools	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x							
	Design pilot projcts incorporating real-time monitoring tools into existing programmes and policy initiatives			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				
	Evaluate utility of tools and suitability for institutional adoption at scale					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Output 5																									
Local engagement and capacity development	Conduct regular codejams/hackathons in conjuntion with local innovation hubs and Makerere University to support technology development and test ideas	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Provide regular briefings to local public sector on big data opportunities, research findings, new tools, and policy implications	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Support sustainable institutional adoption of tools with proven value (resulitng from pilots)										x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

10. Draft Results Framework

Goal	Intermediate Outcome	Deliverables/Outputs	Activities
Overall Goal: Increase resilience and well-being of Uganda vulnerable populations to economic and other shocks with appropriate UG government interventions and response.			
Increase the ability of Uganda government to anticipate potential shocks/crises	*Improved access to real-time developmental, economic data*	*• Core partners have been cultivated and have agreed to provide relevant data sets. • Data is usable for significant analysis. • Data streams are available on an on-going bases to Pulse Lab Kampala, and USG as well as partners in close to real-time.*	*• Partners have been identified and value propositions clarified • Partners have been engaged in conversations and agreements on providing relevant data sets on an ongoing basis. • Proceeses are developed for ongoing data cleaning to whatever extent necessary, normalized for relevant analysis. • There is ongoing activity to identify and cultivate additional partners and data providers throughout the life of the project as technologies and*
	Improved ablility to analyze data for specific indicators and early warning signals for economic and other shock of target populations	*Agreement and continued development of key indicators that yield insight into economic or other shock to populations.*	*• Relevant analytical tools are developed to meaningfully analyze data for agreed upin indicators. • UG partners are trained and informed on an ongoing basis of how to use such tools with embedded data scientists, trainings, workshops, briefings. • Partnerships with academic institutions are developed to develop analytical frameworks and tools.*
	Improved ability to meaningfully respond with appropriate policy responses to indicators of economic or other shock	*Key decision makers in UG are provided with meaningful analysis of relevant data and menus of policy options, if appropriate.*	*• High-level trainings and assistance to help UG understand possible policy reponses, including bi- and multi-lateral dialogue with other host countries of Pulse Labs. • Regular briefings and trainings with key decision makers in relevant UG goovernment agencies are conducted. UG line staff recruited, hired, and regularly trained and engaged in real-time data*
Increase the ability of Ugandan NGO and private partners to analyze and focus resources based on real-time data they generate	*Improved ability of partner organizations to meaningfully analyze and use real-time data they generate to focus specific resources*	*• Agreement and continued development of key indicators that yield insight into economic or other shock to populations. • Partners are trained and have the right analytical tools readily available and know how to deploy them.*	*• Relevant data streams are identfied and analytical tools are developed to meaningfully analyze data for agreed upin indicators. • NGO and business partners are trained and informed on an ongoing basis of how to use such tools with embedded data scientists, trainings, workshops, briefings.*
	Improved access to real-time developmental, economic and other data for decision making.	*• Core partners have been cultivated and have agreed to provide relevant data sets. • Data is usable for significant analysis. • Data streams are available on an on-going bases to Pulse Lab Kampala, and USG as well as partners in real-time.*	*• Relevant data scienctists, partnerships, and agreements are cultivated and executed to provide partners with in-house capacity to conduct analysis on an ongoing basis. • Relevant academic, software, and private partners are recruited and engaged in relevant*
Increase ability of a global network of real-time data partners within UN and host countries of Pulse Labs to use real-time data for development analysis and response.	*Improved global understanding of the relevance and applicability of real-time data for development. Increase ability of host countries to respond in a more agile fashion to changes in the development environment.*	*• A network of global Labs and partners that engage in regular information, tool, and analysis exchange. • Collaborative software and analytical tool repositories and code bases. • Training and response knowledge bases for host gountry governments, NGO, and private partners.*	*• Establish regular channels of exchange/briefings and knowledge shares to build on each others work. • Establish joint code repositories, cross-national edvents, and skillshares. • Establish online repositories of knowledge bases of training curricula, policy response kits for host countries.*