Project funded by the GSMA Mobile for Humanitarian Innovation Fund

This initiative has been funded by UK aid from the UK government and is supported by the GSMA and its members. The views expressed do not necessarily reflect the UK government's official policies.



GRANT PROJECT LESSONS AND OUTCOMES

Flowminder, FlowKit

GRANT PROJECT DATES

July 2018 to February 2020

Flowminder is a non-profit organisation that uses mobile operator, geospatial and survey data to support decision making related to the well-being of vulnerable or marginalised populations in low- and middle-income countries (LMICs). Their mission is to enable decision makers to access the data and evidence they need to transform the lives of vulnerable people, at scale. They do this by providing information and capacity strengthening to governments, mobile network operators (MNOs), national and international agencies and researchers.

Flowminder received a GSMA M4H Innovation Fund grant to support the development of their FlowKit software. FlowKit can support more efficient disaster response through a number of functions, allowing the rapid generation of aggregated data (group-level statistics) from Call Detail Records (CDR) by engineers and analysts. The development of FlowKit was also supported by the Digital Impact Alliance (DIAL) as well as other donors to Flowminder.

FlowKit is an open-source suite of software tools that enable secure processing and analysis of anonymised CDRs, a dataset automatically generated by mobile operator networks for billing purposes. FlowKit overcomes a key challenge for MNOs interested in engaging with humanitarian and development actors: the provision of secure and privacy-conscious processing of sensitive customer data. The software is designed to be set up behind their firewall, and to facilitate the production of anonymised CDR aggregates that can be used for many applications linked to population density, movements or characteristics.

FlowKit has for example been installed in Ghana and Haiti, where Flowminder partnered with MNOs, Vodafone and Digicel respectively, and worked closely with them to install the software in their data centres and set up systems for population flow monitoring.

KEY STATS

6 **Reduction in days required to process and analyse CDR data for humanitarian purposes**

5 **Countries with a FlowKit installation**
(as of March 2022)



Project Outcomes & Lessons

OUTCOME

FlowKit reduces the time it takes to provide robust mobility data following a disaster

Once installed, FlowKit can be set up to continuously retrieve, validate and record databases, following automation and data quality processing by the MNO, meaning preliminary analysis can happen automatically as soon as data records are made available by the MNO to the FlowKit software installed behind its firewall. This means that up to date, pre-event baseline datasets can always be ready. The system is therefore able to provide usable datasets very soon after a crisis occurs, reducing the time needed to generate actionable mobility and displacement insights.

This can provide disaster response actors with accurate information about the movements of affected people, enabling them to plan their assistance accordingly. During this grant project, Flowminder demonstrated that, when pre-installed on an operator's system, FlowKit could reduce the time taken to provide actionable insights from an average of eleven days to just three or four. This can help response actors access information which may help them provide assistance to those who need it the most with greater efficiency and effectiveness than previously possible.

"One of the key challenges during an emergency is getting help to those who need it the most as efficiently as possible. A tool like FlowKit could really change things. This could save lives, not just time and money."

Christine Latif, World Vision*

*Source: FlowKit: Unlocking the power of mobile data for humanitarian and development purpose, White paper, p10



OUTCOME

As an open-source and free tool, FlowKit has reduced the time required by an mobile network operator (MNO) to decide to engage into humanitarian projects

FlowKit is a fully open-source version of Flowminder's proprietary system, allowing their proven toolset to be used across a variety of databases and to be modified as needed for different uses. Any organisation interested in using mobile operator data for response planning or wider development purposes can now trial the analytics tools before committing any resources.

An MNO partner is still required for the system to be used in a live disaster response but this can now happen after the software has been tested by the MNO and proved suitable for its system. By providing the open-source code free of charge, Flowminder is helping break down barriers to using vital mobile operator data in emergency response planning.

FlowKit was designed so that MNOs can independently install and configure a demo version of FlowKit, without support from Flowminder. This significantly reduces the technical review process on the MNO side and is key to generating the required approval to install the full version of FlowKit behind the firewall of the MNO. The software comes with comprehensive instructions as well as quality assurance tools developed for a variety of humanitarian and development use cases. It also includes practice data so that the software can be tested and checked before it is used on live CDRs. To test this, Digicel Haiti downloaded the FlowKit demo and installed the system in their data centre unaided. This successful pilot also provided an opportunity to gather feedback on the demo installation process and instructions before it was rolled out to other MNOs.

For organisations that do want assistance, Flowminder is able to provide a package of tailored support.

CASE STUDY

An ongoing partnership between Flowminder, Vodafone Ghana and Ghana Statistical Services

Since installing FlowKit in 2019 for their Data for Good project, Vodafone Ghana, Flowminder and Ghana Statistical Services (GSS) have continued working together on projects to strengthen GSS' capacity in performing mobile data analysis. In 2020 and 2021, the project teams were able to process and analyse anonymised mobile data provided by Vodafone Ghana using FlowKit, to produce mobility indicators to help public health experts respond to the COVID-19 outbreak.

Insights and mobility patterns could be constantly updated to provide an ongoing overview of the fast-moving situation. The partnership made it possible to identify how population movements were affected by movement restrictions, nationwide school closures and a nationwide ban on public gatherings. This included specific detail on how population movements changed after lockdown measures were lifted in parts of the Greater Accra and Greater Kumasi metropolitan areas. As well as supporting the response to COVID-19, it demonstrated how anonymised and aggregated data from MNOs can inform decision-making and scenario planning before, during and after a crisis. Reports, hosted on GSS' website, are accessible here.

CASE STUDY

Partnering to strengthen disaster response and preparedness in Mozambique

Mozambique faces severe challenges due to cyclones, flooding and other water related natural hazards. In 2019, Mozambique's mobile regulator INCM (Instituto Nacional das Comunicações de Moçambique) invited the Government of Mozambique and its National Institute of Disaster Management (INGD) to meet with the country's three MNOs Mcel, Vodacom and Movitel to discuss strengthening the country's disaster preparedness and response. The three MNOs and INCM came to the decision to form a technical working group on 'data for development' and to use FlowKit to support INGD's decision making before, during and after cyclone events.

By identifying changes in phone users' residence around the time of sudden onset disasters, FlowKit can be used to detect population displacements and returns. Using outputs from FlowKit, INGD will be able to track disaster-driven displacement, monitoring where people go, and how long they remain displaced. By integrating this data into its national disaster preparedness and assistance systems, INGD will benefit from better operational planning and allocation of resources before, during and after cyclones and other rapid onset disasters.



LESSON

FlowKit demonstrates the shared value of partnerships in delivering mobile-enabled solutions

At its core, FlowKit facilitates collaboration by breaking down one of the technical barriers previously limiting the use of mobile data in emergency response. FlowKits' development was heavily influenced by Flowminder's experience of forming strong relationships and working collaboratively to achieve impact. For successful ongoing partnerships, both sides must benefit and the toolset was developed with a strong understanding of the needs and priorities of both humanitarian and MNO partners.

Developing effective partnerships can be challenging and clarity about the roles and responsibilities of each partner was also key to the projects' success. For Digicel Haiti and Vodafone Ghana to be willing to install FlowKit in their data centres, they had to completely trust the system from a technical and data privacy perspective. By working together and supporting capacity strengthening of endline users, Flowminder was able to ensure its partners had the resources and knowledge to make use of the most relevant data.

LESSON

Open-source licencing can support scalability and sustainability

FlowKit was designed to be compatible across a variety of network systems. The testing and development of innovative mobile technology can be costly, with many software solutions lacking financial sustainability until they have reached scale. Open-source development encourages contribution from the wider humanitarian and mobile sectors. Open source software benefits from users working on similar challenges sharing their experiences and advice, and working together on modifications and improvements. As FlowKit is increasingly used, it will continue to evolve as users incorporate their feedback and learnings into the tools, processes and techniques.

KEY FEATURE

Operating behind a mobile network operator (MNO)'s firewall ensures secure and compliant data use

Complications around data security and privacy issues are by far the biggest challenges facing MNOs and humanitarian and development organisations when using mobile data in emergency response. MNOs do not want to expose themselves to any unnecessary risk so any data provision relies upon their confidence that it will be used in accordance with all relevant data and privacy legislation.

GSMA data privacy guidelines specify that all data processing should be carried out within an MNO's premises, and by running behind their firewall FlowKit is inherently compliant. Once the software has been installed in an MNO's data centre, an external user, approved by the MNO, can only interact with the data through its secure API. As well as providing tools that facilitate the management, processing and analysis of the data, the API keeps a detailed record of all data processing to ensure confidential and compliant use. Detailed role and credentials management allows authorised organisations using FlowKit to control which authorised user is allowed to see which part of the system and data ingested into FlowKit.

FlowKit, the future

These various implementations have shown that FlowKit can help reduce the time needed to produce timely and relevant insights and that investing in preparedness is key to successful crisis responses. Countries with a FlowKit installation include Ghana, Haiti, Namibia, Mozambique, and the Democratic Republic of the Congo. Two MNOs in two additional countries may join the cohort.

Interest has increased since the start of the COVID-19 pandemic which has demonstrated the potential reach and impact of the solution. Flowminder has performed 'near real-time' analyses for key stakeholders and decision makers involved in COVID-19 responses. They are also planning to perform more detailed and rigorous ongoing analyses to provide an in-depth understanding of the evolving situation in Haiti and Papua New Guinea.

DATA SOURCES



- ***Flowminder project reporting***
- ***FlowKit:*** *Unlocking the power of mobile data for humanitarian and development purposes (2019)*
- *Insight into the effect of mobility restrictions in Ghana using anonymised and aggregated mobile phone data (2020)*