



The potential and challenges of open data for crisis information management and aid efficiency

A preliminary assessment

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Open data is the idea that certain data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control. The goals of the open data movement are similar to those of other "Open" movements such as open source, open content, and open access.the term "open data" itself is recent, gaining popularity with the rise of the Internet and World Wide Web and, especially, with the launch of open-data government initiatives such as Data.gov. http://en.wikipedia.org/wiki/Open_data

Introduction

The availability of information, and public access to this ever-increasing supply of data, has been growing exponentially since the birth of the World Wide Web. The penetration of the Internet, the increasing use of mobile technologies, the Internet of Things and satellite imagery have enabled individuals, governments, international and humanitarian organizations, NGOs, businesses at all levels, across almost all countries, to create, access, collate, use and communicate a massive amount of both previously inaccessible and newly generated information. Access to data or information translates into empowerment; power to make informed decisions, to solve problems, to generate economic activity, to improve living standards and, in the case of humanitarian emergencies, to protect and save lives. The integral value and many positive spin-off benefits, in particular for the work of the humanitarian response community, emerging from this flattening of the global information hierarchy, need to be reinforced for those who would prefer to keep data in silos, locked away through licenses, patents and proprietary technology. At the same time, the negative use of collated or triangulated open data for destructive purposes against populations or individuals at risk should not be underestimated.

In recent years, governments have started to embrace public demand for access to information and have made increasing amounts of data accessible through various open data initiatives. In January 2009, President Obama, launched the Open Government Initiative (www.data.gov); the UK followed shortly thereafter as did other countries including Norway, Canada, Australia, Kenya etc. In September 2011, a group of countries including the USA, the UK, Brazil, Indonesia, Norway, South Africa, the Philippines, Mexico, launched the Open Government Partnership (OGP). The membership of the Open Government Partnership now consists of 52 countries and the first OGP summit will take place on 16 April 2012 in Brasilia, where it is expected that 42 countries will introduce their national open data plans. The UK Government recently launched an Open Data Institute to innovate, exploit and research Open Data opportunities and to help demonstrate the commercial value of public data. It will also help the public sector use its own data more effectively.²

Complementing this trend of making government data accessible has been the growing commitment of significant players in the development, aid and humanitarian response community including the UN and World Bank, to open their datasets with the goals of improving humanitarian response, development and aid effectiveness. **The World Bank** has implemented an open data initiative and Open Aid Partnership (<http://wbi.worldbank.org/wbi/open-aid-partnership>). Its online Data Catalogue provides download access to over 7,000 indicators from World Bank data sets³. The World Bank also currently has three different APIs to provide access to different datasets: one for Indicators (or time

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² Sir Tim Berners-Lee and Prof. Nigel Shadbolt will be co-leading the newly established Open Data Institute.

³ <http://data.worldbank.org/>

series data), one for Projects (or data on the World Bank's operations), and one for the World Bank financial data (World Bank Finances API)⁴.

Importantly, the UN is also shifting gears to both make its own data open, and open its analysis and decision making frameworks to information sourced from datasets outside its traditional domains of comfort and control. The UN's Crisis Information Strategy (CiMS), stresses the importance of sharing information and ensuring that the systems in place amongst the UN agencies and its partners are interoperable. The devastating earthquake in Haiti in 2010, was a turning point in the UN's thinking about the importance of transparent, interoperable and open data. Haiti demonstrated clearly that actors outside the UN system are today, with their own sophisticated technology platforms, vital first responders producing, disseminating and archiving information before and often despite the UN and governmental actors. Key information after a sudden-onset crisis often came from sources outside the UN and official Governments channels – for example with mapping and GIS information, health infrastructure related information, ground conditions and ad hoc IDP camp locations.

To support the UN Office for the Coordination of Humanitarian Affairs (OCHA), the ICT4Peace Foundation helped establish the web platform for the Common Operational Datasets (CODs)⁵:

Common operational datasets are predictable, core sets of data needed to support operations and decision-making for all actors in a humanitarian response. Some of the CODs, such as data on the affected population and damage to infrastructure, will change during the different phases of the response and therefore will need to be frequently updated and maintained. Other CODs, such as rivers and village locations, are likely to remain the same throughout the response. The CODs are proactively identified and maintained prior to an emergency as part of data preparedness measures and made available by the OCHA (or pre-agreed in-country alternate) within 48 hours of a given humanitarian emergency. All CODs must meet minimum criteria for format and attribute information in accordance with national standards.

Fundamental operational datasets (FODs) are datasets required to support multiple cluster/sector operations and complement the common operational datasets. These datasets are characterised by thematic areas (such as education facilities) and are made available as soon as possible after the onset of an emergency given availability.

Less than one year after it went live, as of mid-December 2011, 142 COD datasets were registered on the platform - 76 of which are for priority countries. 36 countries have at least one COD registered. Furthermore, 33 FOD datasets are registered, of which 25 are for priority countries. 16 countries have at least one FOD registered. In a report (*Connecting Crisismapping to the United Nations*⁶) published as early as October 2010, the ICT4Peace Foundation outlined the possibilities for and potential of crowd-sourced information to fertilise UN OCHA's CODs and FODs.

Non-governmental organizations are also pushing for increased openness. Building on existing projects, NetHope, “a consortium of 34 international NGOs, has launched a process called the Open Humanitarian Initiative, which aims to

- Improve information sharing amongst humanitarian organizations.
- Improve information management capacity both within humanitarian organizations as well as within governments in disaster prone countries⁷

⁴ <http://data.worldbank.org/developers>

⁵ <http://cod.humanitarianresponse.info/>

⁶ <http://ict4peace.org/updates/connecting-crisismapping-to-the-united-nations>

⁷ Call for Open Humanitarian Information, Gisli Olafsson, NetHope Inc., CSCW 12, February 11-15, 2012

Hundreds if not thousands of open datasets already exist⁸, and platforms like the Open Knowledge Foundation's CKAN datahub⁹ help ordinary users access them. Some initiatives include:

The International Aid Transparency Initiative (<http://www.aidtransparency.net/>), OpenAid.SIDA, Sweden (<http://www.openaid.se/en>), Open Aid Data (<http://open.aiddata.org/>), Humanitarian Response Common and Fundamental Operational Datasets Registry (<http://cod.humanitarianresponse.info/>), Open Data For Resilience Initiative (OpenDRI) (<http://gfdrr.org/gfdrr/opendri>), Google Public Data (<http://www.google.com/publicdata/directory>).

The potential of open data for crisis information management, aid and development

The benefits of increased, verified, quality information and open government data for crisis information management, humanitarian response operations and for improving development and aid activities are manifold. The combined impact of open government, open World Bank and open UN data with new technologies and movements such as crowdsourcing and crisis mapping is simply enormous. Crowdsourcing not only provides new information, often critical during a humanitarian crisis, but can also be a means through which to verify existing information, improve accountability, increase the effectiveness of humanitarian operations, assess delivery of government services, improve governance, and monitor elections and market information.

In 2011, Kenya opened its data on various government activities and basic services including health, poverty and education. This in turn enabled a wide range of civil society actors, statisticians, and researchers to analyse the data, with the ultimate goal of improving government services through the provision of new ideas, innovative technologies and solutions to existing problems. This kind of multi-layered substantive public dialogue with governments indicates a fundamental shift in thinking in terms of the importance of sharing what was previously fiercely protected information. We are witnessing, on a global level, a growing acceptance and integration of actors outside of the traditional halls of power into the thinking and processes of governments and international organizations. For many countries, opening themselves to public criticism marks an abrupt shift from the past, the importance of which should not be underestimated. "With significant support from the World Bank and the Mapping for Results program of the World Bank Institute, Kenya has taken the first steps towards empowering citizens through openness of information".¹⁰ In parallel to the Kenyan government's open data initiative, Ushahidi has also launched the platform "Huduma" through which citizens can, via twitter, email and sms, indicate problems with the delivery of government services. Kenya is not alone in its move toward open data and the exploration of new avenues to improve aid efficiency and accountability. For example, Ghana, also a member of the Open Government Partnership, is moving forward in rolling out an eGovernment Network Infrastructure (GovNET), building on a cooperation and feasibility study prepared by the Web Foundation in 2011.

The World Bank is playing a critical role in supporting the open data movement, having mapped and geocoded, in partnership with AidData, more than 30 000 geographic locations for more than 2 500 Bank-financed projects (<http://maps.worldbank.org>). Crowd-sourced information will in turn help aid transparency and accountability through the geolocation of projects, and via crowd-sourced feedback systems by population. This can be combined with open government data (e.g. socio-economic data available on county and village level) and crowd-sourced information by population to triangulate and visualize on maps, where projects are, since when, and whether there are duplications or not. This information can also be used to demonstrate whether there has been economic and social improvement in a given area as measured by the socioeconomic data, available via open government initiatives

⁸ <http://delicious.com/pskomoroch/dataset>

⁹ <http://thedatahub.org/>

¹⁰ The Role of Crowdsourcing for Better Governance in Fragile State Contexts, Maja Bott, Bjorn-Soren Gigler and Gregor Young, KfW Entwicklungsbank, Open Development Technology Alliance

including investments in the various economic sectors and information about schools, hospitals, roads etc.

As concerns crisis information management in particular, it is clear that an informed decision is preferable to an uninformed decision, in particular when facing life and death situations, the protection of vulnerable populations and other critical issues. The importance of openly available country specific Core Datasets (CODs) and Fundamental Datasets (FODs), mentioned above, are critical when responding to an emergency situation. Where are the hospitals located? Road access? Telecommunication installations? Population statistics? All of these pieces of information complement each other, to provide a comprehensive picture of a given situation, crisis, emergency, which in turn allows the humanitarian community to respond more effectively and make informed decisions. The CODs and FODs (<http://cod.humanitarianresponse.info>) are part the UN's Crisis Information Management Strategy (CiMS), which consists of four pillars, including data architecture, technology development, stake-holder management and capacity building¹¹

In addition to the UN's CiM strategy there are also many other examples of organizations trying to improve the decision-making ability of humanitarian actors. The Open Data for Resilience Initiative (OpenDRI), part of the Global Facility For Disaster Reduction And Recovery (GFDRR), a partnership of 39 countries and 8 international organisations committed to helping developing countries reduce their vulnerability to natural hazards and adapt to climate change, "aims to reduce the impact of disasters by empowering decision-makers with better information and the tools to support their decisions". (www.gfdr.org/gfdr/opendri).

An example of OpenDRI in action is www.haitidata.org This website is built using a free and open source software tool, GeoNode, and makes risk assessment data produced following the 2010 Haiti earthquake available for anyone to download and use. This tool enables individuals and organisations to contribute data and download data, thereby enabling people to collaborate and utilise these data required to rebuild Haiti. ,

Open Data can also contribute to healing, understanding and the identification of socio-economic, ethnic, cultural, religious, partisan, political, tribal and other patterns that help early warning, mitigation, response and recovery. Aid agencies working in some of the most complex political emergencies today are already realising the potential of Open Data to transform their work on the ground. The Visualising Afghanistan initiative¹² by The Asia Foundation notes:

The Open Data Movement, the notion that certain types of should data be "open" and available to all for analysis and evaluation, is an idea that's creating new opportunities to strengthen development efforts across many fields. For The Asia Foundation, we see opportunities in areas like transparency, accountability, and good governance where open data can help enhance efforts to build more responsive and effective institutions of governance.

Robert Kirkpatrick, Director of UN Global Pulse at the Executive Office of the Secretary-General, stressed that datasets are the aggregation of thousands if not millions of disparate nodes - from remote sensing information to SMSs by citizens - and this has the potential for massive, real time and regressive data analysis, which in turn can save lives:

"Global Pulse is looking... for the smoke signals that could reveal collective changes in behaviour related to incipient harm in many areas of human life. Our Pulse Labs - beginning with Pulse Lab Kampala late this summer - will allow governments, development organisations,

¹¹ *Status of implementation of the information and communications technology strategy for the United Nations Secretariat, Report of the Secretary-General (A/65/491)*

¹² <http://asiafoundation.org/in-asia/2011/11/16/visualizing-afghanistan-a-path-to-open-data/>

academe and the private sector to come together, experiment with new data, tools and approaches, and develop a formal methodology whereby the earliest smoke signals are used to trigger a process of investigation, verification, and response. We will likely need to analyse data gathered through remote sensing, social network analysis, news media mining, and crowdsourcing of citizen reports, and combine it with traditional indicators already used in crisis monitoring. Only then might we be in a position to understand the underlying causes and risks of future impacts on health, nutrition, livelihoods, or education, and to use this information to improve our capacity to protect vulnerable populations from harm.”

Finally, the role of crowdsourcing and crisis mapping is also playing an increasingly significant role for citizens in fragile states. This has been the subject of exploration and study by the Open Development Technology Initiative:

“As the early experience has shown, crowdsourcing and GIS-based interactive mapping are already widely used practices of citizens within fragile states. Whether they will have a significant impact on governance depends largely on how governments relate to the phenomenon. Embracing its potential, especially for participatory development planning and monitoring of issues by citizens, could increase governments’ accountability and ultimately legitimacy, while trying to stifle crowdsourcing initiatives could contribute to further destabilization of regimes”¹³

It is becoming quite clear that open government data and open data initiatives, combined with or leveraged by crisis mapping and crowd sourcing, can enhance aid efficiency, transparency and humanitarian operations.

The challenges of Open Data for crisis information management, aid and development

Despite the many positive developments explored above, many challenging issues also arise as a result of open data, the combination of open data with crowd-sourced data and crisis mapping, and the ability to cross-reference, triangulate and profile data linked to specific groups and/or individuals. The challenges range from overcoming a resistance to sharing, to capacity-building, to technical challenges (how best to share the information, how to get the data ready for sharing, choice of platforms) to issues of critical life-threatening concern such as how to uphold the “do no harm” principle of humanitarian work in this newly emerging environment.

Despite the explosion of open data and information sharing, there is still quite a long road to go before all the necessary actors are convinced of the benefit of openness and transparency. There are still serious challenges in terms of licensing, proprietary technologies and commercial interests, which need to be addressed. In fact, the question of licensing is often overlooked as one that would only interest the geeks or lawyers. Actually it is one of the most under-studied and important determinants when discussing open data. The case was most recently and eloquently made by Patrick Meier, the Director of Crisis Mapping & Partnerships at Ushahidi on the announcement by the World Bank that they were partnering with Google to “access Google Map Maker’s global mapping platform, allowing the collection, viewing, search and free access to data of geoinformation in over 150 countries and 60 languages.”¹⁴ The concern however is over Google’s licensing agreement for the data that it harvests from citizens in those one hundred and fifty countries and in sixty languages. As Meier rightly cautions,

“Or is this about using citizen cartographers (as free labor?) for commercial purposes? Will Google push Map Maker data to Google Maps & Google Earth products, i.e., expanding market

¹³ The Role of Crowdsourcing for Better Governance in Fragile State Contexts, Maja Bott, Bjorn-Soren Gigler and Gregor Young, KfW Entwicklungsbank, Open Development Technology Alliance

¹⁴ <http://google-latlong.blogspot.com/2012/01/world-bank-and-google-join-forces-to.html>

share & commercial interests? Contrast this with the World Bank's Open Data for Resilience Initiative (OpenDRI), which uses open source software and open data to empower local communities and disaster risk managers.”

The significant danger is that the license agreement that underwrites this new partnership is incomprehensible legalese for most who will see it as an opportunity to map themselves, their ideas, challenges and aspirations using Google's tools. In other words, this is no ordinary agreement. These are two giants coming together to create an opportunity for participatory mapping that is unprecedented, and precisely because of this, focussed attention on what is a retrogressive licensing scheme that sadly plays into the worst fears and perceptions of the Bank in developing countries, and the worst concerns of Google as a corporate, parasitic entity.

Capacity building in information management and the development of technical know-how in data sharing, platforms, analysis, data mining, are also real challenges in particular for many developing countries. New incentives and training programs are required to encourage individuals to move into data /scientific fields. Development organizations need to focus attention and integrate / embed these new fields into their aid projects of the future. The role of government is also critical in terms of investing in applications to ensure that the data they are opening is actually in a useable form for its citizens. As noted by Juliana Rotich of Ushahidi: “ Beyond providing the data online, governments need to invest in applications that make the data accessible and useful to citizens” ¹⁵

In this new information-rich world, privacy and security are of great concern, not only for the average user who can be profiled, tracked and marketed to based on his / her preferences, but in particular for victims of crises, target groups in a conflict zones, populations at risk in war situations, refugees and IDPs. Mechanisms need to be explored, developed and put in place to safeguard vulnerable groups and basic human rights, while at the same time enabling the best use of open data, crowdsourcing and geo-location for the common good. In some cases this might be mean withholding highly sensitive data from an open platform, e.g. the geographic location of a population at risk in a conflict zone who could then be targeted by enemy groups.

Open Data will in the coming years just become part of the information we take for granted in our daily lives. What is big today will be dwarfed by what is produced by an increasing number of Earth's inhabitants in the future, through devices as small as a mobile phone through to the output of big science that will exceed many times over global Internet traffic today. Through the initiatives and expertise of governments, NGOs and transnational corporations, information is being unlocked and published. Citizens with new tools and devices are producing their own information. We are at the dawn of a new age of empowerment, the flattening of the information hierarchy and perhaps the biggest democratic process in the history of mankind. This fast moving process requires detailed further study, both of the issues raised in this paper and also building on the important work being done by a myriad of NGOs and international organizations.

¹⁵ “Big Data, Big Impact: New Possibilities for International Development”, World Economic Forum, p.7

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ICT4Peace took root with pioneering research on the role of ICTs in preventing, responding to and recovering from conflict in 2003 and led to the adoption of Paragraph 36 by the World Summit on the Information Society (WSIS) in Tunis in 2005 which recognises “...*the potential of ICTs to promote peace and to prevent conflict which, inter alia, negatively affects achieving development goals. ICTs can be used for identifying conflict situations through early-warning systems preventing conflicts, promoting their peaceful resolution, supporting humanitarian action, including protection of civilians in armed conflicts, facilitating peacekeeping missions, and assisting post conflict peace-building and reconstruction*”.

The ICT4Peace Foundation works to promote the practical realisation of Paragraph 36 and looks at the role of ICT in crisis management, covering aspects of early warning and conflict prevention, peace mediation, peacekeeping, peace-building as well as natural disaster management and humanitarian operations.

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