BUILD PEACE

WHITE PAPER
Use of Technology for Conflict Analysis

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Introduction

There are 6 billion cellphone subscriptions in the world today. This corresponds to a global penetration rate of 86 percent. At the same time, one third of the world's population is online. These numbers are growing faster than ever before, particularly in the developing world. There, mobile subscriptions dwarf fixed lines. Cell phone penetration in sub-Saharan Africa now exceeds 50 percent, compared to the reach of fixed telephone connections to only 1 percent of the population. Major regional differences remain, however. While Internet penetration levels in the developing regions rose to 26 percent by the end of 2011, they remained below 15 percent in Sub-Saharan Africa.

Despite these low penetration levels in some areas, the diffusion of cell phones and the Internet have brought dramatic cultural, social, economic, and political changes in societies around the world. There are two important byproducts of the proliferation of new information and communication technologies (ICTs), which are particularly relevant for conflict analysis.

Two consequences for conflict analysis

First, the use of ICTs is leading to an unprecedented diffusion of both knowledge and power. The digital information age has contributed to the substantial growth of social networks as well as the number and diversity of actors with a microphone. Relatedly, the ability to be influential and to be influenced at a rapid and continual pace is fundamentally affecting the methods of conflict actors and creating new spheres of contestation. For example, much has been said about the role of social media in the eruption of the so-called Arab Spring. Factors such as the massive increase in the number of mobile devices with cameras add the capacity for wide spread documentation of events on the ground not previously available. Greater Internet access and the ability to reach millions of people worldwide has had huge implications both for information dissemination as well as narrative shaping. This implies that there are potentials for the rise of "citizen conflict analysts" or "citizen propagandists." The line between the two is not always clear.

Second, the proliferation of cheaper, faster and more powerful ICTs has dramatically increased the ability of users to supply vast troves of passive information through the public and private domains. In fact, a growing number of sources is now producing an enormous quantity of data in an overwhelming variety of formats. Cell phones generate metadata that can be used to map poverty or to track the social networks of criminals. Computer records and browsing history can be used to track and prosecute child pornographers or to better target advertisements. Computational algorithms can be used to optimize high frequency financial trading, create better recommendation engines for commerce or entertainment, detect fraud or to sequence the genome for cancer research. Obviously, this data deluge carries great potential for conflict analysis and peacebuilding more broadly.

The "Digital Gaps"

However, the ability to leverage these potential modes of analysis has been uneven both in terms of geography and sector. Where in the past the "digital divide" has largely centered on access to ICTs, increasingly it is becoming more about access to data and the capacity to analyze it. This is particularly evident when it comes to conflict analysis. Capacity is not evenly spread across actors. First, international organizations and NGOs tend to have limited technological know-how and financial resources, compared to the private sector and certain intelligence agencies. In times when the United Nations is asked to "do more with less," investments in technology capacity remains a challenge. Second, there is a cultural gap. While the "tech world" tends to talk about data revolution and proclaim the coming of a new era, governments and policy-makers have a much more cautious approach, with a skeptic outlook over the role of "disruptive technology" that will transform all fields of business. This tendency reinforces the capacity gap and pushes further aside the two worlds – technology and policymaking.

Current Trends

That said, data-driven approaches and innovative uses of ICTs are not a so-new in the field of conflict analysis. Political economists like Paul Collier began using econometric models at the World Bank to try to assess the various drivers of conflict since the late 1990s. Bruce Bueno de Mesquita has used game theory to build forecasts for international relations at least. Jay Ulfelder is working on a research project to develop an accurate and reliable early warning system for genocide and mass killing as well as using crowdsourcing expert opinion to assess yearly country level risk. In the last few years a new crop of academics like Chris Blattman and MacCartan Humphries been using randomized experimental design to conduct robust monitoring and evaluation of post-conflict development interventions. Blattman also produced an interesting study on patterns and trends in local-level conflict and cooperation in rural Liberia, where a lack of reliable data is particularly acute. More recently, a number of initiatives have sprung up to attempt connecting the potential of new technology to the understanding of conflict trends and dynamics. These follow initiatives in development (i.e., poverty mapping, health indicators, climate impacts) and humanitarian aid (i.e., disaster response), where the use of new technology is more advanced than in the peace and security field. With no ambition to be exhaustive, a sample of relevant projects include the following:

- **LRA Tracker**: This joint project, developed by Invisible Children and Resolve, is a real-time mapping platform and data collection system created to make information on the atrocities committed by the Lord's Resistance Army transparent and widely available. Using information sourced from Invisible Children's Early Warning Radio Network, UN agencies, and local NGOs, this tool aims to provide information for better response from governments, policy-makers, and humanitarian organizations.

- **Harvard Humanitarian Initiative's (HHI) Program on Crisis Mapping and Early Warning**: Launched in 2007, Crisis Mapping and Early Warning examines the use of ICTs in conflict and disaster settings. Research focuses on identifying patterns in humanitarian emergencies to improve response capacity, through crisis mapping, geospatial and crowd sourcing technologies. The program also seeks to develop an evidence base to evaluate ICTs, to convene the humanitarian and technical communities, to facilitate dialogue among humanitarian actors, and to provide new sources of data to improve understanding of conflict dynamics.

- **Interpeace**: Interpeace brings in the practitioner peacebuilding lens to capitalize on the opportunities that new technology is providing for peacebuilding processes, including conflict and early warning analyses, while not overlooking the ethical considerations that emerge from this application.

- **IPI Data Lab**: In 2013, the International Peace Institute launched the IPI Data Lab aiming to leverage data science (data mining, visualization, and machine learning) to help drive new insights on how the multilateral and local actors can approach complex crises and vulnerabilities in the areas of peace, security, and stability. A first project focused on aggregating global subnational vulnerability indicators to be used for the application of machine learning conflict predictive algorithms. Another project (with UNDP AND USAID) focused on case studies of new ICTs for conflict prevention.

- **Private Sector Initiatives**: Many private companies began offering risks and threat analysis and assessment to business, mainly organizing open source information, using GIS-mapping tools, and providing targeted analysis. Initiatives include *Caerus Associates*, which focuses on complex, conflict-afflicted, and disaster-affected environments (i.e., mapping of conflict in Aleppo, Syria, GIS-based technology for urban resilience); *Palantir Technologies*, which builds software that allows for integrating, visualizing, and analyzing large amounts of information, including structured, unstructured, relational, temporal, and geospatial data. (i.e., combating terrorism, prosecuting crimes, fighting fraud); and *Recorded Future*, a web-based intelligence company that offers a patented software for collection, visualization, analysis, and reporting of large open-source information (i.e., cyber intelligence, corporate

security, defense intelligence)

- **Satellite Sentinel Project (SSP)**: The SSP was launched in 2010 as one of the HHI's chief projects in the Crisis Mapping and Early Warning Program. Today. SSP is a partnership between the Enough Project, which provides field research, policy context, and communications strategy, and DigitalGlobe, which provides imagery from its constellation of satellites and geospatial analysis. It conducts monitoring of both Sudan and South Sudan to assess the human security situation, identify potential threats to civilians, and detect, deter and document war crimes and crimes against humanity.

- **United Nations Development Programme (UNDP)**: The UNDP's Bureau for Conflict Prevention and Recovery (BCPR) is exploring the use of Big Data as an information source to complement existing conflict analysis information sources. Through identifying and tailoring indicators to local contexts that can provide complementary information about political, economic, and social dynamics, UNDP aims to use this information to adjust and inform UN policy and programming on the ground. UNDP/BCPR have already developed pilot projects in Georgia and Tunisia to assess the value of Big Data for conflict analysis and early warning using the Global Data on Events, Location, and Tone (GDELT) dataset. A new pilot project will investigate real cases and tangible results for the use of Big Data in crisis prevention and recovery.

- **Ushahidi**: The Ushahidi platform is an information collection and mapping tool that is combined with crowdsourcing to document crisis using the Web, SMS, Facebook, Blogs, Twitter and smart-phone apps. The platform was initially used to crowdsource the documentation of human rights abuses during Kenya's 2007 post-election violence. Since then, Ushahidi has been used to document violent conflict in Gaza, Libya, Syria, and Egypt; elections in the Sudan; human trafficking worldwide and disaster response in Haiti — to name just a few applications. This experience is inspiring many other similar initiatives, including a training course by USIP (U4U) that brings young people from conflict zones around the world to train them in the use of crowdsourced mapping tools like Ushahidi.

- **US Institute of Peace (USIP)**: The USIP's Center of Innovation: Science, Technology & Peacebuilding combines a mix of research, convening, and training to develop innovative strategies for applying science and technology to the challenge of peacebuilding in fragile states, active conflict and post-conflict societies.

A few suggested trends

These initiatives, while not the only ones, give us a broad survey of the "state of the art" of the field. Some key trends include:

- The field of peace and human security is beginning to enjoy many benefits from the newfound ubiquity of mobile ICTs, since NGOs, governments, and researchers now have the ability to gather and analyze data about ongoing conflicts and atrocities in unprecedented ways. The vast majority of these initiatives are **not academic exercises**, and many organizations are focused on operational uses of technology to actively assist people in enhancing their security.

- Most initiatives aim to take advantage of mobile technology and the internet to gather data and maintain nearly **real-time situational awareness**. This is where the potential of mobile technology is especially exciting since two-way communication can produce increasingly precise and accurate warnings to move people out of harm's way. The natural progression is to not just visualize what a crisis looks like but to predict what is going to happen next and then attempt to influence that outcome for the better.

- However, despite the claims of action-oriented goals, many initiatives focus on the **use of geographic information systems** (GIS) to map and visualize various aspects of conflict and post-conflict activities. It remains to be tested how these visualizations and increased information transparency are leading to more effective responses.

- Perhaps the most significant innovation created by advances in technology for conflict analysis is the **empowerment of individuals** to participate in conflict-prevention and peacebuilding initiatives in their own communities and societies. In other words, it seems that new technologies have greater potential neither in "top-down" nor "bottom-up" mechanisms, but for "bottom-bottom" approaches. Many initiatives seem to work on facilitating the horizontal spread of ICT use for conflict analysis as a way to connect more "warners" and "responders" more quickly, and contribute to communities' resilience in the long term.
- Many initiatives focus on **micro-level and granular data**, as well as on **high-frequency updates**. The "unit of analysis" is shifting from national to local level. The goal is to be able to move from country-level forecast of conflict and crisis to city-, neighborhood-, and village-levels, with a precision of weeks, if not days. This would allow affected-people to receive almost instant warnings and move out of harm's way or take other preventive actions which take into account tactical-level local dynamics.
- There is **still a huge potential** for the application of technology to conflict analysis. Most initiatives suggest there is still a huge gap between what non-profit projects are doing and the possibilities represented by the private sector and even certain governments (i.e., the NSA).
- On the other hand, it seems safe to bet the future will see these tech-driven projects **becoming integral part** of the conflict analysis and peacebuilding toolkit.

Key Issues

All of that said, there are a number of challenges and issues to keep in mind.

1) First and foremost are the **ethical dilemmas**. New technologies make it possible to acquire more granular information to inform conflict analysis—whether this data is voluntarily given in the form of citizen reporting, harvested from the data deluge online, or collected using new surveillance technologies. These raise questions around the levels of trust, transparency, and control that individuals, businesses, and governments are willing to accept when it comes to sharing data via digital technologies in a context of violence and conflict. In an IPI-USAID-UNDP study, it emerged that ethical issues are central to the effectiveness of early warning systems based on new technology. In Kenya, for example, suspicion and distrust of national police and security establishments may contribute to communities' reluctance to share information for early warning with the National Steering Committee. In Brazil, citizens were more likely to report crime if they felt confident they could do so anonymously. And in Sudan, there were indications that when communities understand what their information is going to be used for, they may be more willing to participate.

2) Second, there seems to be **bipolarity in the way practitioners are approaching the use of technology and data**. On the one hand there are the "evangelists" who tend to see the use of new technology as a panacea for all of the issues that have previously hindered effective conflict analysis and peacebuilding. New technology is viewed as a "disruptive" force that can shake things up for the good and break all of the silos. On the other hand, there is a school that views new technology as over hyped and over-promising on what it can actually deliver. The truth is likely somewhere in the middle. New technology and data science should be viewed as a useful addition to practitioners' toolkit, but not the only part of it.

3) Third and somewhat related, there is a large issue with **inherent bias**, especially in some of the new Big Data methodologies. It has taken a number of years to get to the current state of the art in terms of statistical methodology in modeling conflict drivers and dynamics. And even now there is a wide variety of critiques. A new generation of analysts will need to acknowledge the past while moving forward. All social science data contain bias. The biases *must* be dealt with openly and transparently. One example, data gleaned from cell phone

records speaks to the subset of the population that uses cell phones. To try to extrapolate further risks glossing over what are likely systematic differences in the characteristics of those people who use cell phones and those who don't can produce misleading outcomes. A maxim here should be "not everything can be measured, so know what you're measuring".

4) Fourth, there is the issue of **competencies**. Very rarely do those who have access to technological knowhow also have the contextual knowledge (e.g., conflict-affected countries, government policies and politics, multilateral institutions' mechanisms, etc.) to ask the correct questions. The risk is to have Big Data, but no Big Answers. How do we foster better communication and trust between the technology and policy worlds, as well as how to develop cross-understanding of the two respective fields, remain key issues. Partnerships are important but so is building and keeping skills in both environments.

5) More and transparent information does not necessarily lead to more and effective action. The application of new technologies to conflict analysis has yet to show robust results in improving intervention. With or without new technology, this is particularly true when it comes to bridging the **gulf between warning and response**. Beyond examining the provision of warning or identification of conflict drivers, further research into technology's impact on response could be the most helpful for the field of peacebuilding and prevention as a whole. This could include assessing how ICT can be used to generate incentives for action, which seems to be more promising at localized level, and to link decision-making processes with early-warning and conflict prevention mechanisms. And given the huge pools of information that now need to be analyzed for actionable information, governments and international actors also need to invest heavily in analytical capabilities at local, national, and international levels.

Suggested Discussion Questions

1. What are the current trends in using new technology for conflict analysis?
2. Where the gaps and what are the next steps to foster the use of technology in conflict analysis? Can we foresee what the next "big things" are going to be for conflict analysis, in 3-5 years?
3. What are the most exciting promises that new technology can carry to conflict analysis? What are the main risks and weaknesses? Can we overcome these limitations?
4. In a field that is heavily dominated by theories of causation, is the use of Big Data leading to a theory-free field, where we can say what is happening, but not necessarily why? Will be "good enough" understanding of conflict trends "good enough" for policy-makers to act?
5. Will technology help to fill the gap between knowledge and action, between conflict analysis, early warning, and intervention?
6. What are the key ethical dilemmas in the use of technology-generated data applied to conflict analysis? How these dilemmas hinder the effectiveness of the analysis? What can be done to solve these dilemmas?