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ICTs for Monitoring & Evaluation of Peacebuilding Programmes

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Practice Products for the CCVRI

Improving Measurement in DFID Crime, Conflict & Violence Programming

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Document Summary

Title: ICTs for Monitoring and Evaluation of Peacebuilding Programmes

Purpose and intended use of this document:
The purpose of this paper is to explore the incorporation of information and communications technologies (ICTs) into the monitoring and evaluation (M&E) systems of peacebuilding programmes. It introduces the reader to the breadth and depth of new technologies that are currently available or could potentially be available to monitor and evaluate (including measure and disseminate) results of peacebuilding programmes. More specifically, the paper focuses on exploring the application of the following ICTs: mobile technology, social media, big data, the digitization of surveys, and tools to better visualize data. Each section outlines a series of resources and some advantages and drawbacks to utilizing the new technology for M&E purposes. When appropriate, examples and case studies have been included.

Key questions this document addresses:

- How can ICTs help overcome key structural and programmatic monitoring and evaluation challenges as they relate to peacebuilding programmes?
- How have ICTs been integrated or used to monitor and evaluate peacebuilding programmes?
- What are the key considerations that must be taken into account when incorporating new technologies into monitoring and evaluation systems for programmes implemented in conflict and fragile environments?
- What are some of the resources, in terms of hardware or software, available to practitioners?

Intended audience of this document (including assumed skill level):
The primary audience of this paper are DFID Advisers and Monitoring and Evaluation Technical staff that are designing or implementing programmes in conflict and fragile states. The secondary audience are implementing partners, including programme and monitoring and evaluation staff. This document is useful for individuals that have a beginner to moderate understanding of ICTs. It assumes that the reader has a good understanding of monitoring and evaluation practices and principles.

Key topics/tags: ICTs, new technology, monitoring and evaluation (M&E), peacebuilding, conflict and fragile states, social science methodology, data collection tools, social media, big data, mobile technology, data visualization, mapping.

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Corlazzoli, Vanessa and Jonathon White. *Measuring the Un-Measurable: Solutions to Measurement Challenges in Fragile and Conflict-affected Environments*. DFID: Department for International Development, 2013.

Alvazzi del Frate, Anna and Ryan Murray. *Tools for measurement, monitoring and evaluation: In-depth focus on surveys.* DFID: Department for International Development, 2012.

Alvazzi del Frate et al. *Tools for measurement, monitoring and evaluation: Making conflict, crime and violence data useable*. DFID: Department for International Development, 2013.

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Introduction

Today, both donors and implementing organisations are seeking to continue to learn from programmes, gather evidence on conflict and peace drivers, and be more accountable to all constituents, including programme participants, national governments, foreign tax-payers, and the overall peacebuilding sector.[1]

While there has been a lot of progress towards the implementation of monitoring & evaluation (M&E) best practices, the sector struggles on how best to overcome key conceptual and practical challenges. Questions remain about what is the best approach to monitor and evaluate concepts and changes that are inherently abstract, complex, and can often only be witnessed over long periods of time. The field is unable to systematically collect information rapidly, process it in real-time, and distribute it to all stakeholders in a consumer-friendly format. It must do this while not losing the nuances or complexities of the issues or the underlying factors that contribute to conflict. Finally, even when monitoring systems are in place, peacebuilding evaluators have yet to master a cohesive and convincing way to communicate impact of programmes and their contributions towards peace writ large.[2]

In hope of overcoming some of these monitoring and evaluation challenges, peacebuilding practitioners have turned to incorporating new technologies into their monitoring and evaluation systems. This paper explores such a relationship and it introduces the reader to the breadth and depth of new technologies that are currently available or could potentially be applicable to monitor and evaluate (including measure and disseminate) results of peacebuilding programmes. By analysing the existing or potential uses of ICTs in M&E systems, the paper aims to shed light on whether ICTs may also help practitioners overcome long-standing monitoring and evaluation structural challenges.

Given the on-going creation and adoption of new technologies and the breadth and depth of monitoring and evaluation manuals, this paper is not prescriptive in nature. It will not seek to describe in detail "how" to install, adapt, or use the technology; or "how" to implement monitoring and evaluation systems.[3] Instead, it will focus on highlighting some of the technologies that are available, when they are appropriate for implementation, and some of the considerations that must be taken into account when utilizing these tools in fragile and conflict-affected environments. Throughout, the author has included many examples, case studies, and further resources. When available, the paper aims to present solutions or alternatives to existing and on-going challenges. The reader is encouraged to follow links to resources and technology solutions, and continue to explore footnotes for more detailed information.

While the author has provided numerous resources and highlighted technologies throughout the paper, the list of resources (Appendix A) is not and should not be considered exhaustive. In fact, new approaches are created and processes are improved on a monthly basis. Therefore, the information in this paper should be considered the beginning of a conversation and not the definitive answer on the topic of ICTs for M&E in Peacebuilding Programmes. The author also does not advocate on behalf of any particular new technology or resource, and encourages the reader to think critically about aligning programmatic needs with technology use.

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[1] The increasing trend towards M&E can be seen in the creation of new frameworks and literature, new donor policy (Paris Declaration OECD DAC Guidance), creation of networks for practitioners (DME for Peace Learning Portal), and the increasing number of relevant events in Washington and Geneva.

[2] Church, Madeline, Diana Chigas, and Vanessa Corlazzoli "Impact Evaluation and evaluating Impact of Peacebuiding Guidance Note" DFID (Forthcoming May 2014).

[3] Reference for Technology see Mobile Technology Handbook from Pact and Mobile-based Technology for Monitoring and Evaluation from the Clear Initiative. Reference for M&E Systems see Designing for Results from Cheyanne Church and Mark Rogers.

For general guidance on more traditional social science approaches, data collection tools and methodologies, and ways to overcome measurement challenges related to peacebuilding, the author encourages the reader to consult *Measuring the Un-measureable: Solutions to Measurement Challenges in Fragile and Conflict-Affected Environments,*[4] a publication that is part of this series of Guidance Products and a prelude to this paper.

This paper is structured into three chapters that enable the reader to either read the paper from start to finish, or to simply focus on the sections of greatest interest. The paper begins by briefly providing an overview of key definitions, including Information and Communication Technology (ICT), peacebuilding, and monitoring and evaluation. The second chapter fulfils the primary objective of this paper by presenting a series of new technologies that are either the most widely used or that have the greatest potential to monitor and evaluate peacebuilding projects in conflict and fragile environments. Lastly, the paper concludes with the key considerations that practitioners must taken into account when integrating ICTs into M&E practices, and a reflection on the status of adoption of new technologies in monitoring and evaluation of peacebuilding programmes.

[4] Corlazzoli, Vanessa and Jonathon White. *Measuring the Un-Measurable: Solutions to Measurement Challenges in Fragile and Conflict-affected Environments*. DFID: Department for International Development, 2013. http://dmeforpeace.org/learn/measuring-un-measurable-solutions-measurement-challenges-fragile-and-conflict-affected-environ.

Chapter 1: Definitions

Given the cross-sectorial dimension of this paper, it is important to introduce key definitions of concepts that are incorporated throughout the following chapters.

Definitions of **Information and Communication Technologies (ICTs)** focus on the use of technology to convey information, however there are some definitions that also discuss the process (transfer and collection of information), use (social media and analysis), and purpose (increased depth and breadth of communications) of ICTs.[5] *'Hardware'* refers to the physical support used for electronic or digital survey purposes and *'software'* as the programmes that allow for performing tasks and processes on these physical supports. There are also interchangeable terms used to describe ICTs, including the term "new technology."[6] For the purposes of this paper, the author will use the United States Institute Peace (USIP) definition of ICT as a "diverse set of tools used to **create, disseminate, and manage** information. These technologies include the Internet, intranets, wireless networks, and cell phones, as well as such services as videoconferencing and distance learning."[7] While this definition is wide in scope, it emphasizes that new technologies must support a larger process of gathering, creating, and disseminating information.

Peacebuilding has been defined by the Organisation for Economic Co-operation and Development (OECD) "as an action to identify and support measures and structures that will strengthen and solidify peace in order to avoid a relapse into conflict."[8] USIP expands on this definition to add that peacebuilding "involves a transformation towards more manageable, peacebuilding relationship and governance structures—the long-term process of addressing root causes and effects, reconciling differences, normalizing relations and building institutions that can manage conflict without resorting to violence."[9]

Monitoring and Evaluation of Peacebuilding has been defined by Cheyanne Church and Mark Rogers as the "systematic acquisition and assessment of information gathered on specific questions to provide useful feedback for a program, organisation or individual….to serve two purposes: learning and accountability."[10]

Given the overlap of definitions, this paper will aim to outline the key new technologies and methods that enable the creation, dissemination, and sharing of information to systematically assess peacebuilding evaluative questions. The information collected should be used to inform all stakeholders, including programme staff and participants, about the effectiveness of reconciliatory and peacebuilding processes.

[5] Rios Paul & Gorka Espiau. "New trends in peace-building: Another form of social innovation." Institut Catala Internacional per la Pau, Barcelona, 2011.
[6] ICTs are also referred to as new technologies in this paper.
[7] Snodderly, Dan, ed. *Peace Terms: Glossary of Terms for Conflict Management and Peacebuilding.* Washington, D.C.: United States Institute of Peace, 2011: 29.
[8] OECD-DAC. *Guidance on Evaluating Conflict Prevention and Peacebuilding Activities*. Paris: OECD Publishing, 2008: 15.
[9] Snodderly, *Peace Terms*, 41
[10] Church, Cheyanne & Mark M. Rogers. *Designing for Results: Integrating Monitoring and Evaluation in Conflict Transformation Programs.* Washington, D.C.: Search for Common Ground, 2008: 93.

Chapter 2: ICTs for M&E in Peacebuilding

The challenges of monitoring and evaluating international assistance programmes in fragile and conflict-affected states are not unique to the peacebuilding, security and justice sectors. In fact, most of the challenges have not only been well documented, but also experienced by most professionals working in fragile and conflict-affected states. In *Improving Peacebuilding Evaluation*, Andrew Blum argues that despite progress in terms of tools created, manuals written, and basic information disseminated about monitoring and evaluation, there remain four outstanding structural challenges in the practice of peacebuilding evaluation. These can be summarized as:

1. the need for better articulation of how programme level outcomes lead to peace-writ large,
2. the need for stronger evidence and methods that can lead to concrete conclusions of impact at all programme levels,
3. the lack of aggregated data across multi-layered accountability systems; and
4. the lack of utilization of peacebuilding data, as organisations are immersed in a competitive distribution of funds environment.[11]

Each of the sections below explores where the integration of new technologies into monitoring and evaluation of programmatic activities *can or may help* to overcome some of the structural challenges stated above. To do so effectively and efficiently, peacebuilding and monitoring and evaluation practitioners must approach technology as an enabler. They must recognize that new technologies will not be the sole solution, but instead can be *part* of the solution *to some* of the challenges stated above. Practitioners must do so, while implementing strong M&E practices, and improving the degree of collaboration between and amongst the different actors, including between donors and with programme participants. Without adequately and critically thinking of the purpose and process of integrating technology, it may add frustration and unnecessary complexity to what can be fragile monitoring systems.

If implemented deliberately and with purpose, technology may also add value to every-day monitoring and evaluation systems. Technology can assist in more effectively and efficiently capturing, processing, analysing, and storing outcomes and outputs of programmes. More specifically, technologies may help integrate different types of data to create a more comprehensive analysis of conflict situations, track indicators more systematically, and better engage with participants through improved data visualization techniques.

But before deciding to introduce a new technology to a monitoring and evaluation system, one will want to ask the following series of questions:

1. What are the changes (objectives) that the programme and activities are trying to produce?
2. What is the information that needs to be collected to measure programme outputs, outcomes, or impacts? Is there literature or publicly available sources of information where the data can be easily found?
3. What is the information that needs to be collected to improve programming? What is the information that needs to be collected to advance the field of peacebuilding and add to the volume of literature?
4. What are the social science tools, methodologies, or mechanisms that will allow one to best capture the information outlined in questions 1 through 3?

[11] Blum, Andrew. "Improving Peacebuilding Evaluation A Whole of Field Approach." *USIP Special Report,* 280, June 2011: 3-5; Corlazzoli, Vanessa &, Jonathan White. *Measuring the Unmeasurable.* DFID, 2013; Church, Cheyanne. *Evaluating Peacebuilding: Not Yet All It Could Be*. In B.Austin, M. Fisher, H.J. Geissman (eds.). "Advancing Conflict Transformation." Opladen/Framington Hills: Barbara Budrich Publishers: 2011.

If the answer to question 4 includes the utilization of an ICT to measure, analyse, or disseminate information ask yourself:

5. Will the new technology/technologies that I have chosen help or hinder the data collection process?
6. Is the new technology that I am applying culturally and contextually appropriate?
7. Are the necessary infrastructure systems in place in the implementation area to support the new technologies?
8. Will the new technology cause harm to staff, data-sources, or the overall contextual situation?
9. Will the time and resources needed to create or adapt the new technology and learn how to implement it outweigh other benefits?
10. Does the staff have the professional capacity or technological literacy to apply the new technology? If not, are additional resources required? Have these been included in the programme budget?
11. Will the new technology introduce bias? If so, how can bias be reduced or tested for?
12. What training and technological considerations are required to ensure the safety and security of staff, data-source, and data in the short and long term?
13. Will the technology help make monitoring and evaluation processes more efficient? Will it enable better sharing of results with all key stakeholders, including programme participants? Will it enable for quicker evidence-based decisions?

After reflecting on each of these questions, it will be easier to decide whether ICTs serve the programme's M&E needs. If ITCs *do* support your collection, analysis, or dissemination of critical information regarding your programme, monitoring and evaluation best-practices must be adhered to including conflict sensitive and do no harm principles. Regardless of whether you use traditional social science methods or new technology, tools must be tested and lessons learned incorporated. Processes may endanger staff or participants and this must always be considered in the setting up and execution of M&E systems. Gender sensitive, cultural and conflict, as well as age appropriateness should also be mainstreamed throughout the entire M&E process, as with any other peacebuilding intervention.

Structure of Chapter 2

The section below introduces a series of ICTs that can or may be used for monitoring and evaluation of peacebuilding programmes. Some of the ICTs will help solve structural challenges to monitoring and evaluation, and other ICTs have the potential to better enable monitoring and evaluation processes.

To ensure structure within the paper, the new technologies have been placed under the M&E challenges that they are most likely to contribute to or have already been applied. That being said, the new technology tools could be categorized in many different ways, as each has a range of purposes and uses. There is also a natural interconnectivity between many new technology tools and applications. For instance, mobile phones are a new technology that can take an instant photograph of a peacebuilding activity, but they can also be used to digitize a survey, send information via social media, and be part of a data visualization process. To ensure simplicity, the tools have been divided into two overarching categories (1) Data Creation, Collection, and Analysis and (2) Data Visualization.

A. Data Creation, Collection, and Analysis: Tools: Mobile Phones, Interactive and Online Maps, Big Data, Social Media Analysis, Digitizing Surveys

B. Data Visualization Tools: Tools: Data Visualization & Dashboards

A. Data Creation, Collection and Analysis

Introduction

At the core of monitoring and evaluation in fragile and conflict-affected states is the ability to identify, collect, and process key data that enables one to make decisions to improve programmes in near real-time, while also demonstrating immediate and long-term results of the programmes implemented related to conflict and peace drivers. In complex environments, where the root causes of conflict are often entrenched and dynamics are constantly evolving, ensuring that the right information from multiple sources is being collected remains a challenge. In places where infrastructure – such as roads – is a barrier for quick movement, ensuring that the voices of remote, rural, transient, and vulnerable populations is heard continues to be a collective priority. Although no consensus on the appropriate balance between rigorous methodology and 'good-enough' approaches has been reached, the need to demonstrate tangible programmatic results is immediate. Without this critical information being collected at all levels of programme implementation, from outputs to outcomes to impact, it is difficult to identify the contributions from programmes to peace writ large.

The peacebuilding sector is collecting more data than ever before as more conflict assessments, baselines, and evaluations are conducted. Figuring out which information is most relevant in fragile and conflict-affected states is and will continue to be debated. Improving monitoring systems and sharing the data more widely will help set evaluative standards and with time will enable practitioners to confidently, not just anecdotally, speak to national and international contributions towards peace.

The tools outlined below do not overcome all of the challenges listed above. However, they are slowly beginning to fill important gaps by collecting different types of information in near real-time related to conflict dynamics or programme implementation. They are also enabling practitioners to monitor nation-wide processes, such as electoral violence. This section highlights software and approaches that enable monitoring and evaluation practitioners to also process data more rapidly in a more accessible manner. Steps to digitize qualitative and quantitative data must be accompanied with the implementation of stronger consent procedures and security and safety standards, particularly in fragile and conflict-affected states.

Tool: Mobile Phones

Mobile communication provides direct access to beneficiaries, participants, and citizens, and usually takes place through mobile phones. This hardware enables the transfer of information through radiofrequency waves. Mobile phones are grouped in three categories: (1) *basic phones*, which can make and receive calls and text messages; (2) *feature phones*, which have the same functions as basic phones and have a camera, extra storage capacity, basic applications and can access the internet; (3) *smartphones*, which have the same elements as feature phones, and allow users to add applications to their phones, have 3G/4G, and have Wi-Fi capability. Depending on the operating system (Android, iOS, Windows, Blackberry), mobile phones come with a series of applications that enable for data to be captured (voice, image, text, location), shared or transmitted (via voice, text message/SMS, or file share), and stored (databases, data reporting, and management interfaces).[12] Using smartphones also provides the opportunity to download a variety of data collection applications (apps) based on purpose and need.

[12] *Mobile-Based Technology for Monitoring & Evaluation.* Clear Initiative, 2013: 10-11. http://www.theclearinitiative.org/mobile-based-tech.pdf (accessed April 4, 2014).

Mobile phones are the new but no-longer-so-new technology that has been most widely applied towards monitoring and evaluation in this sector. In fact, important reference guides on how to use mobile technology for M&E have been written and should be consulted.[13] Key lessons learned include:

- Involve *all* stakeholders in design, collection, and dissemination,
- Develop a plan to select appropriate technologies and implement the mobile technologies for your programme's M&E system,
- Timeframe and budget will dictate degree of mobile technology implementation, and
- Keep in mind power, infrastructure, and logistical restrictions of technology during planning.

How have Mobile Phones been used for M&E purposes in Peacebuilding? The peacebuilding sector has quickly adopted mobile phones into monitoring and evaluation systems to **collect near real-time monitoring data** about outcomes and results of programme activities, both for accountability and learning purposes. Specifically for peacebuilding, data has been gathered to ensure accountability in terms of whether activities were implemented on time and as per agreements, particularly in remote areas. For instance, camera features in phones are used to capture photographs of activities. They are also used to estimate audience size at town hall meetings, facilitated dialogue processes, and participatory theatre activities in remote areas. Additionally, mobile phone applications have been used to store voice interviews with remote populations and key information for the creation of success stories.

Organisations can and do use mobile phones to improve programming via **direct contact with participants across large programme areas**. Mobile phones help organisations hear directly from their staff and project participants by encouraging call-in participation or texting, creating two-way communications and closing important feedback-loops. Search for Common Ground (SFCG) capitalizes on increasing mobile phone access to solicit feedback for their radio programmes and to ensure that programming is responding and adapting to conflict dynamics. SFCG also encourages listeners to share feedback and questions on radio content via text message. In this way, text messages from the general public, monitoring officers, and community-radio directors (processed via Frontline SMS) provide insight to the public's level of perception of certain characters and topics.[14]

Mobile phones can also be used to conduct short surveys and questionnaires with participants, gathering **large and varied information** on programme impact. For example, by including short questionnaires in their radio programmes in the Democratic Republic of Congo and Cote D'Ivoire, SFCG is able to continuously measure knowledge and attitude change of participants via their text message responses.[15] Storylines and programming can then be adapted for future episodes based on participant feedback. SFCG also uses its extensive databases of phone numbers to randomly call programme listeners and gather more in-depth information about the radio programmes that they produce, strengthening programming and responding to listeners' feedback.[16]

The collection of **near-real time data** allows programmes to react quickly to changing contexts. UNDP Georgia has also been collecting input from community network members through the Elva programme to create a community safety network, supporting police and security response to conflicts and potential conflicts. Text messages are submitted weekly by community network members in the 18 communities near the boundary line with South Ossetia. Messages are also sent out immediately after incidents, increasing response time of security forces and restoring safety in the community.

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[13] See *Mobile-Based Technology for Monitoring and Evaluation* from Clear Initiative and *Mobile Technology Handbook* from Pact.
[14] SFCG DM&E. "SMS technology and SFCG programming." *SFCG Intranet*. May 2012. (Internal document); Corlazzoli, Vanessa. "Monitoring and Evaluating Media Drama: SFCG Lessons Learned" (forthcoming, June 2014).
[15] Slachmuijlder, Lena. "Bridging the Digital Deficit in the Democratic Republic of Congo: Search for Common Ground's media for peacebuilding programming." (forthcoming document).
[16] Koch, Dirk. "Success Story #3: Suing SMS to enhance audience interaction in DRC." *SFCG Intranet*. June 2013. (internal document).

Overall, mobile phones have been used to **collect large data** sets four main ways. First, practitioners have collected and saved data on mobile phones, usually smartphones, instead of traditional paper-based methods. Second, they have used text messages to send questionnaires to participants and gathered their views through text messages. Third, organisations have created crowdsourcing systems to allow participants to share questions, comments, and information at any time, used especially for early warning systems.[17] Lastly, organisations have conducted surveys over the phone.[18] For more information on the use of mobile phones and digitizing surveys see page 11 and 23.

Example: SFCG Uses Text Messages to Conduct Conflict Scans

Mobile phones have been used to monitor conflict drivers and trends as part of conflict assessments and conflict scans. NGOs, such as Search for Common Ground, have selected, trained, and convened individuals who act as conflict monitors. These individuals send text messages through mobile phones when there is a change (increase or decrease) in violence or in a conflict driver. In northern Nigeria, SFCG has allocated a phone number where the public at large can submit information via text messages. Whether the text messages come from conflict monitors or the general public, the information is often triangulated with other sources of information from government officials or media. Depending on the severity of the information being transferred, it may trigger coordination or response. Monthly reports are created and distributed to key stakeholders. In this way, mobile phones support the establishment of a participatory early warning system in Plateau State.

Some of the information from text messages can also be integrated with mapping tools and data visualization tools (see page 14 and 27). This type of activity is both a programmatic activity as well as a monitoring tool, capturing impact level and proxy indicators.

Organisations have learned that when setting up conflict scans where the public is involved in providing information, precautions should be taken not to raise the expectations of the public at large. If and when reporting an increase in violence, evaluations have shown that citizens expect that action by security forces (including police or military) will result. If no or little action has taken place, or when there are multiple hotlines, populations have become disengaged with conflict prevention mechanisms.

Why do we like Mobile Phones? Mobile phones have become very accessible and by 2012 it was estimated that there were 700 million mobile phones in Africa. That number is expected to increase to 1 billion mobile phones by 2016.[19] In the Asia Pacific region, approximately 60% of the population used mobile phones in 2013, totalling just under half of the world's mobile phone users.[20] Mobile phone penetration has improved and currently reaches about 3.4 billion of the total 7 billion people worldwide. The technology is easy to use and no additional software needs to be downloaded to use the more basic applications of calling, texting, taking photographs, and storing basic information. The cost of mobile phones also continues to drop, particularly for basic models.[21] In addition, many Internet users in Africa access the Internet via their mobile phones. Mobile phones also enable peacebuilding organisations to capture qualitative and quantitative information about programming results. Use of mobile phones for M&E enables more rapid and frequent communications than paper-based surveys and field monitors.

What to keep in mind when using this tool? While mobile phones are readily available, practitioners

[17] CEWARN. "Kenya Launches a National Early Warning and Response Mechanism." http://www.cewarn.org/index.php?option=com_content&view=article&id=103:kenya-launches-its-national-early-warning-and-response-mechanism&catid=107:news-archive&Itemid=133 (accessed April 4, 2014).
[18] UN Global Pulse. "2010 Mobile Phone Survey." *Research*. http://www.unglobalpulse.org/projects/2010-mobile-phone-survey (accessed April 4, 2014).
[19] USAID. "Mobile Solutions". *What We* Do, 2013. http://www.usaid.gov/mobile-solutions (accessed April 4, 2014).
[20] GSMA. *The Mobile Economy 2013*. GSMA, 2013: 8, 14.
[21] GSMA. *The Mobile Economy 2014*. GSMA, 2014: 46.

must take into account whether the areas that they are operating in have regular network signal and the population overall has electricity to charge phones. Staff must have the appropriate technological literacy to use mobile phones, to operate data collection software, and to ensure that data is not lost. It is also important to decide, for each context, whether information should be crowdsourced or gathered from vetted individuals. This decision should be based on the likelihood of misinformation being provided versus genuine information.

Resources Available:

Elva Platform is a mobile phone platform that facilitates data collection and mapping of local needs and issues of concern using SMS and web reports.

Frontline SMS is open-source SMS management software. It is used to collect and distribute SMS messages, and allows for computer-to-mobile communication.

Magpi/Data Dyne is software used for SMS and audio data collection. The software also allows you to create and manage pre-planned SMS and audio messages to be sent to mobile numbers. It is available for purchase online, and was formerly called Episurveyor.

Rapid SMS is open-source software that allows for large-scale SMS data collection, data analysis, and creates web-based dashboards.

Text to Change provides mobile phone-based solutions for social change via two-way SMS systems.

For a review of mobile survey software programmes, see Annex B.

Tool: Interactive and Online Maps

The utilization of geospatial information to better understand a context or a conflict is not new. Maps have been used for centuries to understand alliances, military manoeuvres, and the interrelated relationship between human behaviour and geography.

While not new, today the application of these kinds of analyses have been made much more accessible due to a growing number of openly available data sets (see page 18), the creation of new data (see page 20), and the availability of free and open-source software mapping applications. These new resources are increasingly user-friendly, as compared to older technologies that required GIS expertise.

This information is usually presented in a Geographic Information System (GIS), a "system that captures, stores, analyses, manages, and presents data that are linked to location."[22] In order to link data to a location, all the data must be *geolocated* or have *geographic coordinates*.[23] There are several ways that information or data can have or be geolocated or given geographic coordinates:

- Some data (i.e. social media) has geospatial information derived from IP addresses, while other sources, such as news reports, do not have this information available,
- Tools, such as tablets and mobile phones, can capture information with coordinates.
- Mobile network operators (MNOs) are another source of geospatial data that indicate where a call or text originated based on the cell tower from which the communication originated.

[22] Walton, Oliver. *New ICTs for* Development. Governance and Social Development Helpdesk, 2010: 8.
[23] Geolocation: the process of determining the geographic location of a person or device via digital information processed online. Geographic coordinate: the intersection point of lines of longitude and latitude.

However, this information is only shared during emergencies and major disasters such as the 2010 earthquake in Haiti.

- The task of geocoding news and social media data for insertion into a map application can be *crowdsourced*[24] through online platforms.
- Automatic Crisis Mapping (ACM) is a real-time, automated information collection mechanism that automatically maps events using complex algorithms.[25] Development of ACM programmes can be very time consuming and requires knowledgeable and experienced staff. Continued deployments of ACM will help refine this process and increase the accuracy of automatic geolocation.

The maps being created can be static (in the form of a visual picture) or interactive on web platforms. The interactive web-based maps allow users to zoom in and out, and explore several layers of information depending on what the user wants to learn.

How has Mapping been used for M&E purposes in Peacebuilding? Maps have been used in the area of monitoring, particularly to **monitor elections or crises**, by presenting relevant information overlaid with geographic information. The 2010 earthquake in Haiti was one of the first applications of crisis mapping on the scale now possible due to social media and the Internet. Participatory collection and creation of these maps provides an opportunity for communities to contribute to conflict resolution through their provision of information and organisations' sharing of results back with participants. Social media, satellite images, and text message reporting, as well as traditional data sources, such as surveys and focus groups, are all sourced for *crisis mapping*[26] operations. Amnesty International has created Eyes on Syria, a website dedicated to documenting abuses suffered by individuals in Syria, bonding people through their experience and forming a strong platform of evidence from which to advocate for a cessation of violence.

Interactive and online maps have been used to **monitor conflict**, but have *not* been used to monitor or evaluate programme performance. In other words, the peacebuilding community has yet to integrate maps as a tool to help explore the change in relationships, attitudes, or behaviours as a result of a programme over time. This may sound surprising given that many peacebuilding indicators have geographic elements: conflict, risk, and threat data. However, there are several reasons why utilizing mapping techniques to enable better analysis of data and to speak to peacebuilding results may have yet to be widely integrated into M&E systems (see following page).

Despite the fact that maps have not been widely used to monitor programme results, two concepts have been put forward by leading new technology experts as a way to utilize maps for M&E. In 2009, Patrick Meier proposed a new mapping concept specific for M&E, *basemapping*, which would utilize this data.[27] **Basemapping** would include three phases: (1) ideal world mapping of what the intervention aims to achieve; (2) real world mapping of the current situation; (3) and changed world mapping that compares the ideal and real, looking for correlations.[28] This type of activity would visualize threat and risk data in near real time to measure change of indicators.

[24] Crowdsourcing: sourcing research via the mobilization of numerous individuals, often via the Internet, provides a large team capable of processing big data in an effective and timely manner.
[25] Iacucci, Anahi. "Crisis Mapping". *Global Health Emergency Course, Global Emergency Medicine Program.* http://www.slideshare.net/AnahiAyala/crisis-mapping (accessed April 4, 2014).
[26] Crisis mapping: the near real-time gathering and analysis of information, presented as an ever evolving, near real-time map of a crisis environment.
[27] Meier, Patrick. "From Baselines to Basemaps: Crisis Mapping for Monitoring and Evaluation (M&E)". *iRevolution*. http://irevolution.net/2009/12/09/basemapping/ (accessed April 4, 2014).
[28] Ibid.

Peace mapping is another potential application of geographic information for M&E purposes. Rather than tracking incidents of violence or conflict, **peace maps** depict organisations, people, and actions for peace. "Peace mapping seeks to place ordinary people and their efforts on the map of the international community while legitimizing and strengthening a conscious and strategic movement towards peace."[29] Partners for Peace in the Niger Delta of Nigeria, hosts a map that includes not only areas of conflict, but also peace actors and peace activities.[30] Recognition of where conflict and peace incidents are occurring helps us recognize potential areas for intervention. Geographic tagging of information can identify underserved areas and uneven distribution within programme implementation, allowing for near real-time adaptation of programme activities to reach intended outcomes.

Example: Understanding Election Monitoring and the Macro Situation

Organisations are working in a variety of countries to utilize maps in their work. For example, election maps have been used to track violations and events during **Ukraine**'s 2012 election, **Tanzania**'s 2010 elections, and **Kenya**'s 2013 elections. Conflict maps have been created for current and past events in **Syria**, **Sudan**, **Egypt**, and **Libya**.

Partners for Peace in the Niger Delta uses a range of sources to create an interactive map outlining areas of conflict on a heat map, identifying peace agents, and identifying peace locations. This map is a combination of a crisis map outlining where there is conflict, and also a peace map outlining which actor is working where. The map is publically available and open for collaboration; organisations can upload key information about their activities and events that they are planning to institute. Partners for Peace also works with other agencies collecting data to in order to aggregate information.

Why do we like Mapping? The utility of maps in all sectors, including peacebuilding, has become popular in part because individuals and networks using inexpensive software to analyse and share data can create maps. Designing multi-layered maps that integrate survey and qualitative data used to require robust mapping software, such as ArcGIS, creating a capacity and resource barrier. This barrier has now been removed by new technologies that are easy to navigate and can layer quantitative and qualitative data. These new technologies, such as FirstMileGeo and Google Crisis Map, are also available free of charge, while other more technical software such as ArcGIS can be costly for an organisation.[31] Another example is The Standby Task Force, a community of volunteers that can be deployed to crowdsource data and create interactive maps.

Also, most organisations' staff are familiar with maps and how to read them. This familiarity facilitates increased and complex information sharing using maps as the medium.

The increasing utilization of tablets and mobile phones to collect data may also encourage more organisations to utilize mapping software to examine their data in new ways (see page 23). When tablets and mobile phones are used to collect data, it is easier to geolocate the survey participant.

What to keep in mind when using this tool? Geolocation data is highly sensitive as it can provide the exact location of participants and, if published with their views, can make them vulnerable to reprisals from government and other groups. This must especially be taken into consideration when conducting crisis mapping in areas under control by repressive regimes. In repressive regimes, all information sent on mobile phones is insecure as the regime has access to any and all information when they control the mobile network. Privacy of mobile phone numbers and personal identification information must be

[29] Heinzelman, Jessica, Rachel Brown, and Patrick Meier. "Mobile Technology, Crowdsourcing and Peace Mapping: New Theory and Applications for Conflict Management." *Mobile Technologies for Conflict Management: Law, Governance and Technology Series*, vol.2, 2011: 40.
[30] Partners for Peace in Niger Delta "Peacebuilding Map" http://www.p4p-nigerdelta.org/peace-building-map (accessed May 1, 2014).
[31] ESRI. "Pricing." *ArcGIS for Desktop*. http://www.esri.com/software/arcgis/arcgis-for-desktop/pricing (accessed April 4, 2014).

preserved to uphold Do No Harm principles. Anonymity and protection of sources must be balanced with practices to ensure the accuracy of information provided for mapping. A decision must be made on what information to publish publically and which to keep private; enough information must be shared to ensure validity of information, while also protecting the anonymity and safety of sources. When crowdsourcing data, it is important to implement a combination of computer and human analysis to best ensure reliability and usefulness of mapping and to overcome any limitations or errors.[32]

Using mapping for M&E of peacebuilding activities should be integrated into peacebuilding activities and programmes. There is a lot of potential for applications of mapping for peacebuilding programming and they may provide insight into **new patterns of programme outcomes**, but there are few examples of organisations integrating mapping and implementing it to its full potential. Maps should be seen not only as a product, but also as a resource and opportunity for **in depth understanding and interaction with a context.**

Maps create a very **shareable form of information and may help with evaluation analysis and use**, however an ongoing challenge is creating data than can be cross-compared. There are few existing data standards and there are multiple spellings of town names and other geographic locations, which can confuse data sharing and collaboration. Organisations are already hesitant to share information and this additional barrier augments their attitude. However, new technology and monitoring and evaluation proponents argue ICTs have the power to address these issues and can actually increase sharing.

Resources Available:

ArcGIS is a platform to create interactive and collaborative maps using your data.

CrisisMappers is an international network of humanitarians using crowdsourced data and ICTs generally to improve early warning and rapid response to humanitarian emergencies. Their forum is a helpful resource.

First Mile Geo is an open, online, cloud-based platform to create map surveys and tools to collect, analyse, share, and visualize social map data.

Google Crisis Map is an online, real-time map with weather, hazards, and emergency preparedness and response information. The information presented is mostly for the United States.

Google Earth is an online, interactive map of the world that displays terrain, 3D buildings, maps, and satellite imagery.

Open Street Map is a free, editable, crowdsourced map of the world which can be used by anyone to create a map specific to their needs.

Quantum GIS is a free, open source geographic information system.

Ushahidi is a non-profit technology company and open source software that can be used for collecting information, creating visualizations, and mapping information.

[32] Iacucci, "Crisis Mapping."

Tool: Big Data

"Big Data" refers to the massive quantities of data that are now generated daily as part of the increasing computerization of systems and records by governments and companies today. In fact, 90% of the data available today was created in the last two years.[33] In addition to text messages, videos, photos, social media content (see page 20), and phone calls, many governments are also making large data sets and statistics available to the public, adding even more "Big Data" to the public domain.[34]

Big data is powerful not because of its size, but because of its potential applications. The amount of data available now allows for **pattern recognition** and **predictions** that were previously impossible.[35] Datamining is the process of pulling insights from this open data. The triangulation of results via big data could create even stronger, more reliable analysis. This could be integral in the ever-changing conflict environments where peacebuilding projects are implemented. That said, at the time of publication the application of big data is under debate and more concrete examples are needed to truly analyse its utility for M&E in peacebuilding.

How has Big Data been used for M&E purposes in Peacebuilding?

Early warning is a possible result of big data analysis. Some peacebuilders feel there is an opportunity to use big data to understand the precursors to conflict for early warning purposes.[36] Others are more sceptical and are hesitant to declare big data the solution to prediction and prevention of violence.[37] Global Pulse, a UN funded and implemented programme meant to capitalize on big data, is meant to track and monitor the impact of crises in near real-time using analytics technologies for faster feedback for programming. The programme continues to be evaluated and the long-term results have yet to be determined.

Real-time awareness of events can be based on analysis of social media content (i.e. Twitter, Facebook, etc.), traditional media hosted online, video, photo, mobile phone use, etc., providing an illustration of the current situation to be used for baseline studies, conflict scans, and design and planning of programmes.[38] Real-time awareness provides continued snapshots of a community at different points in time, helpful for monitoring the impact during the progress of a project where in field collection may be dangerous or too costly. Over time, these snapshots can provide long-term evidence of change. The Global Database of Events, Language, and Tone (GDELT) produces daily reports tracking changes in violence world-wide. A computer analytics programme analyses world-wide media reports available online to create the daily reports. While the Sentinel Project for Genocide Prevention's Hatebase uses big data to track violence and hate speech in near real-time. Hatebase is presented online for NGOs, agencies, and interested groups to investigate hate speech as a precursor to violent conflict.

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[33] Gobble, Mary Anne. "Big Data: the Next Big Thing in Innovation." *Research Technology Management,* vol.56, no.1, 2013: 64-66.

[34] www.data.gov; www.toronto.ca/open; http://data.gov.uk; http://opendata.go.ke; http://data.vancouver.ca/; http://publicdata.eu.

[35] Duhigg, Charles. "How Companies Learn You're Secrets." *New York Times,* February 16, 2013. http://www.nytimes.com/2012/02/19/magazine/shopping-habits.html?pagewanted=1&_r=4&hp& (accessed March 2, 2014); Gayomali, Chris. "Can Twitter Predict Major Events? A New Study Says Yes." *Fast Company,* February 18, 2014. http://www.fastcompany.com/3026593/fast-feed/can-twitter-predict-major-events-a-new-study-says-yes (accessed March 2, 2014).

[36] O'Reilly, Marie. *Robert Kirkpatrick, Director UN Global Pulse, On the Value of Big Data.* November 5, 2012. http://www.theglobalobservatory.org/interviews/377-robert-kirkpatrick-director-of-un-global-pulse-on-the-value-of-big-data.html (accessed March 2, 2014).

[37] Solomon, Daniel. "The murky swamp of big data." *Securing Rights*, December 31, 2013. http://securingrights.wordpress.com/2013/12/31/the-murky-swamp-of-mass-atrocity-data/ (accessed March 2, 2014).

[38] UN Global Pulse. *Big Data for Development: Opportunities and Challenge*s. New York: Global Pulse, 2012: 39.

Real-time feedback on a situation allows for monitoring of a population to make programmatic changes where and when needed as a situation and context changes throughout the programme.[39] For example, analysis of social media information can provide near real-time information, which can support the closing feedback loops (see page 20).

Example: Using Big Data to Address Sensitive Geopolitical Issues

PeacebuildingData.org is an organisation that conducts large-scale surveys of populations in countries impacted by conflict. The information derived from the surveys is coded, analyzed, and posted online as indicator maps. The organisation is converting big data collected into a useable tool for peacebuilders. Currently, they have published maps and data for six countries: Cambodia, CAR, DRC, Liberia, Philippines, and Uganda.

Benetech is an organisation working to create and implement technologies for positive social change. They have been hired by several organisations including Amnesty International and Human Rights Watch to address sensitive geopolitical issues using data. Benetech was commissioned to analyze over 80 million files from Guatemala's National Police, which dated back to the country's civil war (from 1960 to 1996). The files described state-sanctioned arrests and disappearances, and through its analysis, Benetech was able to provide hard evidence of the country's targeting of the Mayan population during the civil war.

Why do we like Big Data? Big data has great potential as a monitoring tool, including the following:

- The availability of data from government and private sources **can track changes in attitudes and behaviours for large groups of people**, without having to spend money from monitoring and evaluation budgets for surveys and interviews.
- Big data also provides an opportunity to track changing attitudes, polarization, and the prevalence of hate speech within and between populations. As Sanjana Hattatuwa states, this information can provide insights on complex political situations, peace negotiations, peace process, post-war state building and reconciliation.[40]
- Big data provides an opportunity for **engagement in the complex processes** surrounding the peacebuilding sector in a more strategic, effective, informed, and efficient manner.[41] Changes in data can be tracked over long periods using open, big data from governments and large organisations, creating long-range evaluation of peace writ large.
- With more data available, evaluators have **more proxy indicators** to choose from, increasing the depth of analysis and evaluation.
- Big data also provides peacebuilders with an opportunity to evaluate conflict drivers and **the impact of conflict at a regional level** supporting evidenced-based decision-making processes for future interventions. The US Department of Defense recently published data on war and conflict from which they hope to gain crowdsourced research on military tactics to inform their future actions.[42]

What to keep in mind when using this tool? Big data can be collected from a variety of sources online, some of which are vulnerable to a manipulation, security violations, and proprietary restrictions.

- Issues of permission and consent for use of data must be considered when utilizing big data. While individuals may be posting information publically, their objective in posting is not to

[39] Leouzé, Emmanuel, Patrick Meier, & Patrick Vinck. "Big Data for Conflict Prevention: New Oil and Old Fires" In Francesco Mancini, ed. *New Technology and the Prevention of Violence and Conflict,* New York: International Peace Institute, April 2013: 9.
[40] Hattotuwa, Sanjana. "Big Data and Peacebuilding." *Stability: International Journal of Security & Development*, vol.2, no.3, 2013: 1-3.
[41] Hattotuwa, "Big Data and Peacebuilding."
[42] Ungerleider, Neal. "Using Open Data to Understand War and Peace." *Fast Company,* August 11, 2011. http://www.fastcompany.com/1776331/using-open-data-understand-war-and-peace (accessed March 2, 2014).

contribute to big data, and they may not want or realize that their activities are being used for monitoring and evaluation purposes.

- Partnerships are key to ensure access to information that is proprietary (i.e. Facebook, SMS records) because, even though there are many publically available sources of data, not all data is open.
- Open data is available to those seeking peaceful resolution of conflict as well as to those perpetrating violence.
- Security and reliability of the data and those providing reports is a priority when working with big data.[43] Governments or conflicting parties can manipulate big data, governments can remove access to the data by cutting off Internet access, and servers housing the data can fail and crash.

Keep these factors in mind when working with big data:

- **Identity:** keep all information that could be used to identify individuals submitting reports private.
- **Location:** geographic information should be utilized as specifically as possible without endangering the reporter.
- **Do No Harm**: information and reports should work to cease violence, rather than cause harm to anyone.[44]
- **Reliability**: data may have bias or serve the purpose of the poster, rather than being a source of raw, unfiltered content. Triangulate information to decrease the effect of bias and increase the reliability of data.

Resources Available:

Data sources – There are now many data sources available online. Please see **Appendix C** for a listing of many of government and organisational open and bid data sets available. Data Catalogues provides a list of many open data sets from around the world. In addition, the United Nations has published data on UN Global Pulse. The World Bank, the US Bureau of Statistics and Labor and the Demographic and Health Surveys have published their data online. Various regional organisations have also published their data online including the African Union and European Union

Software – IBM has created a big data platform. QCRI and GDELT have similar software, some of which they've made available at no cost.

Tool: Social Media

Social media are "forms of electronic communication through which users create online communities to share information, ideas, personal messages, and other content."[45] They can be used to share information with a wide audience, to spark interaction with and feedback from the audience, and to create dialogue between individuals. Information shared via social media gains credibility by leveraging social networks and the trust imbedded in these networks, which can have a positive or negative impact on peacebuilding.

[43] Helmut Pflugfelder, Ehern. "Big Data, Big Questions." *Communication Design Quarterly,* vol.1, no.4, 2013.
[44] Neu, Christopher. "Can Crisis Mapping Help S.Sudan?" *TechChange*, December 26, 2013. http://techchange.org/2013/12/26/can-a-crisis-map-end-the-crisis-in-s-sudan/ (accessed March 2, 2014).
[45] Merriam-Webster Dictionary. *Social media.* http://www.merriam-webster.com/dictionary/social%20media (accessed March 5, 2014).

Following are several popular global social media platforms:

- **Facebook** – an online social networking site that allows for creation of profiles and pages for people, organisations, projects, causes, etc. There were 1.23 billion monthly active Facebook users as of December 31, 2013, 81% of which are outside the United States and Canada.[46]
- **Twitter** – an online social networking and *microblogging*[47] site that allows users to create and share "Tweets," messages of 140 characters or less. There are 241 million active users of Twitter, sending 500 million Tweets per day.[48] 77% of Twitter users are outside the United States.[49]
- **YouTube** – an online video sharing website where users can upload, view, and share videos. More than 1 billion unique users visit YouTube each month with 80% of user traffic coming from outside the United States.[50]
- **Blogs** – are personal websites or web pages where individuals can record opinions, share links, and post photos and videos regularly. An estimated 71% of all Internet users read blogs.[51]

There are many region-specific social media sites in addition to the global social media sites stated above.[52] For the purposes of this paper, this section focuses on the largest, global social media platforms. However, the nature of social media is ever changing and there are also many other emerging social media sites whose role and impact in the social media sphere is still being determined (i.e. Pinterest, Instagram, Tumblr). Much like ICQ and MySpace were relevant at one point in the evolution of the Internet, it is possible that the social media platforms listed above may one day become obsolete.

How has Social Media been used for M&E purposes in Peacebuilding? Information posted via social media can be accessed and analysed as part of big data analysis.

Content analysis of social media sources allows researchers to know **what is being discussed and who is discussing it**, contributing to conflict analysis. The Carter Centre Syria Conflict Mapping Project analyses citizen-generated information and data coming out of Syria, which is currently available online.[53] This project focuses on growth of opposition groups, the evolution of armed opposition groups, activities by pro-government forces, geographic locations of pro and anti-government forces, and up-to-date analysis on the state of conflict in Syria.

Social media sources also provide information for **analysis of a target population's feelings and thoughts** about an issue, person, or country.[54] Research has also shown that indicators can be derived from social media analytics.[55] For example, CrimsonHexagon conducted analysis of Twitter content relating to the Egyptian election in 2012, looking at issues and opinions expressed in Tweets. They found that Twitter users were generally ambivalent about the upcoming elections, with little support for elections and violence.[56]

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[46] Facebook. *Key Facts*. http://newsroom.fb.com/Key-Facts (accessed by March 5, 2014).
[47] Microblogging: posting short entries to a blog or social media site, often using a mobile phone.
[48] Twitter. *About: Company*. https://about.twitter.com/company (accessed March 5, 2014).
[49] Ibid.
[50] YouTube. *Statistics*. http://www.youtube.com/yt/press/statistics.html (accessed March 5, 2014).
[51] Lawrence, Rick, Prem Melville, Claudia Perlich, Vikas Sindhwani, Steve Meliksetian, Pei-Yun Hsueg, and Yan Liu. "Social Media Analytics." *Marketing & Social Media*, 2010.
[52] Nigeria & South Africa: Mxit, China : WeChat, Russia: Mail Agent
[53] The Carter Center. "Syria Conflict Mapping Project." *Conflict Resolution Program*. Accessed April 10, 2014: https://www.cartercenter.org/peace/conflict_resolution/syria-conflict-mapping.html.
[54] Aday, Sean, Henry Farrell, Marc Lynch, and John Sides. "Advancing New Media Research." *USIP Special Report*, 250, 2010: 4.
[55] UN Global Pulse. *Twitter and Perceptions of Crisis-Related Stress*. http://www.unglobalpulse.org/projects/twitter-and-perceptions-crisis-related-stress (accessed March 5, 2014).
[56] CrimsonHexagon. *Egyptian Social Media Analysis Reveals Nation's Perspectives on Election.* May 2, 2012. http://www.crimsonhexagon.com/blog/current-events/egyptian-social-media-analysis-election (accessed March 7, 2014).

Content and ideas can be traced through social media to understand **how information is shared, and who it is shared by and shared to**. USIP's "Blogs and Bullets" reports conduct analysis of social media on USIP priority issues. USIP recently conducted analysis of thousands of Tweets concerning Syria, tracking data creation, dissemination, and use, and paying special attention to the importance of triangulation. Clusters of users were identified based on their information sharing practices, but better tools are needed to adequately conduct sentiment analysis to understand the political implications of clusters and trends identified.[57]

New software and applications are needed to better analyse the interplay between social media users and the content they create for sentiment and long-term analysis purposes. Natural Language Processing (NLP) is the creation of computer *algorithms*[58] to accurately detect the meaning of human-created text or content (i.e. Tweets) for analysis. NLP would allow computers to derive the meaning behind the text, looking for sentiment, feeling, and understanding context, allowing for computers to code and analyse text without human oversight.

Many social media tools have a level of analytical capacity. Twitter and Facebook each have user-friendly **analytics dashboards** available to users. Coding and analysis of qualitative social media data is made much easier by these built in dashboards and analytics platforms. Additionally, *hashtags*[59] can be used to track topics and issues of interest as they change in use and popularity on both Twitter and Facebook.

Why do we like Social Media? The **near real-time analysis** of information and the public nature of this information are key strengths in the use of social media for M&E for peacebuilding. The **large reach and breath of the information** is also beneficial to M&E processes.

- The information provided on social media sites is public, unless a user chooses to make it private. This potentially provides a **wealth of information** for monitoring and evaluation of peacebuilding activities; and social media is a contributor to big data sets (see page 18).
- Social media can have proprietary restrictions that could be overcome through partnerships.
- Information collected is in digital format, making it easier to code, reduces opportunities for human error, and provides a variety of information about the social media user (i.e. location, IP address, site history).
- Peacebuilding organisations may create their own social media page with their "followers" or "fans", which allows for **easier and direct communication between the organisation and their partners and participants**, strengthening the monitoring of their programmes.
- Monitoring of communications with followers on Twitter and Facebook can provide insight on programme impact, and numbers of followers and shares can indicate programme scope.
- The most popular weekly videos on YouTube can provide insight to the **most important issues** and topics of discussion amongst a population that utilizes social media and the Internet.
- Finally, social media can form a part of the conflict narrative, providing **insights on the nuance of conflict** unavailable from other data sources.

What to keep in mind when using this tool? When conducting social media analysis be aware of potential issues of selection bias, trustworthiness of information, and security and privacy of users (see page 33).

[57] Lynch, Marc, Deen Freelon, and Sean Aday. "Blogs and Bullets III: Syria's Socially Mediated Civil War."*Peaceworks,* 91, 2014.
[58] Algorithm: a process or set of rules to be followed by a computer to solve a problem or complete an action.
[59] Hashtag: a word or phrase preceded by a hash mark (#), used to identify and group messages on a specific topic.

- Research shows that social media analytics are best used for short and immediate results; the usefulness of social media analytics for long-term sentiment measurement is still to be determined.[60]
- The algorithms used to determine trending topics and who sees what content on Facebook and Twitter are not publically available; leaving us to speculate about the impacts this has on information flows (i.e. what information people can see, what makes a topic "trendy").
- The medium the information is presented in can impact how information is shared and who shares it. Photos and videos often gain more attention than long text posts.
- There are limits to the information that social media analytics can assess. Many of the analytical tools available for social media are available only in English, making analysis of content in other languages difficult and ad hoc.

Resources Available:

Geofeedia is a platform that allows you to conduct location-based social media monitoring and searches, and also has a sentiment analysis feature.

Google Analytics is a service offered by Google that creates statistics for any website you own. It will track traffic, users, visits, etc. and provide this information to account users only. Multiple users can be added to an account, but a Gmail address is required.

HootSuite is a social media management dashboard that allows you to manage and analyze various social media sources.

Media Cloud is an open-source platform to analyze the content of online media. It can be used to examine what media sources are saying and how stories spread.

Meme Tracker analyzes the daily news cycle to create maps of topics of discussion on mass media and blogs over time.

Piwik is a free analytics software with customizable dashboard used to analyze website traffic and stats, similar to the services provide by Google Analytics.

SAS and IBM have social media analytics software available for purchase. This software collects and analyzes data across a variety of social media and online sources.

Social Mention is a social media search engine that aggregates content from across the web. It measures strength, sentiment, passion, and reach.

Yahoo Pipes is a web platform that aggregates data from the web to create outputs based on your needs. It also provides geocode, sort, filter, and translate functions.

Tool: Digitization of Surveys

Surveys are an integral tool for monitoring and evaluation, providing quantitative data of experiences, perceptions, and attitudes that are key to uncovering causality, change, and impact.

Organisations are increasingly digitizing aspects of quantitative data collection, and mobile phones and tablets are increasingly replacing paper-based questionnaires.[61] Depending on the cost, each device may have a different set of features such as touchscreen vs. keyboard, RAM, or multimedia tools (record videos, camera, GPS, etc.).

[60] Aday et al, "Advancing New Media Research."
[61] Groves, Robert M. et al. *Survey Methodology*. Second Edition. New Jersey: Wiley & Sons, Inc., 2009.

There are many software options available for digital data collection ranging from free, open source software to expensive, licensed options. The World Bank and the IRIS Centre at the University of Maryland completed a helpful study that assesses software for data entry, skip function, branch function, data-management, quality control, cost and effectiveness, the Comparative Assessment of Computer-Assisted Personal Interview (CAPI) Software Packages.

Example: Digital Surveys in India and Africa

Mobile-based Technology for Monitoring and Evaluation offers clear guidance to programme managers on the considerations of using mobile-based data collection. It also includes a case study detailing an impact evaluation on a mothers' literacy project in the states of Bihar and Rajastan in India, which surveyed 8,888 households using mobile telephones, mobile Internet transmission, and remote data aggregation on a web-based server. To conduct the survey, a digital data collection company was hired to develop custom-made software, 120 mobile phones and the necessary accessories were purchased, and a contract negotiated with the telecommunications company for monthly plans with mobile internet and text messaging capabilities. The survey faced challenges in terms of connectivity in rural areas and limitations on phone memory, but overall the quality of data collected was considered to be significantly improved (compared to earlier, paper-based studies) due to the real-time availability of data and the capacity for managers to assess the quality of inputs and productivity on a daily basis.

A survey implemented published by the University of Berkley in 2011 aimed to understand Liberians' perceptions of their post-war security, the population's priorities for peacebuilding, and existing disputes and dispute resolution mechanisms. The survey was implemented using computer assisted personal interviews methodology using the Kobo toolbox suite. The digital collection of the data was deemed successful as it allows immediate verification of outlier data and provides strong guarantees against human error in filling out questionnaires.

Why do we like Digitizing Surveys? The process of digitization is especially useful in conducting household and community-based surveys. The **near real-time availability** of data can immediately feed into other aspects of complex programmes, and **support the sharing of data** while producing sector-wide datasets that can be easily exchanged. There are three key benefits associated with using digitized surveys when conducting M&E of peacebuilding programmes:

- **Improved quality of data collected**: Data integrity can be strengthened as survey digitization contributes to reducing human error. With digitized surveys, consistency checks are automated; for example, mandatory fields can be set up to ensure that enumerators cannot continue with the next question until values are inputted. As data collection is on going, difficulties can be identified and then modified and corrected in near real-time. The lead researcher can consistently check data and outliers can be identified during data collection.
- **Efficiency**: Digitization of surveys removes the manual data entry step, significantly increasing efficiency and saving both time and resources. For example, digitization for data entry can reduce cost and work hours from six weeks with traditional methods to just one week. The rapid transfer of information supported by digitized surveys is especially useful for monitoring and evaluation of peacebuilding projects, allowing for near real-time responses to what can often be rapidly changing situations.
- **Availability and use of peacebuilding data**: Költzow[62] notes the difficulty in accessing peacebuilding data. The potential for storing large amounts of readily sharable data on servers or cloud-based platforms means that various actors can access and upload relevant information. Given the non-linear nature of most peacebuilding work, the accessibility of data in real-time allows for appropriate and sensitive adjustments as needed. Improved knowledge management systems and well coded surveys can help in the **development of proxy indicators**.

[62] Ibid.

What to keep in mind when using this tool? Some of the drawbacks of the digitization of surveys include:

- security risks to the data and to staff responsible for the new technologies,
- systematic and selection bias in survey not mitigated accordingly,
- infrastructure limitations, and
- hardware concerns such as start up costs and potential mechanical failure.[63]

Many companies provide a range of survey software that support design, implementation, and analysis of data (see page 43). The cost of this software varies depending on your desired functions and the method you will be conducting the interview (SMS vs. enumerators in field). Surveys conducted via SMS asking participants to select a single option from a list are easy and fast for individuals to answer and for staff to analyse. SMS survey design must ensure questions and answers easily fall within the 160-character limit of most mobile phones, especially for long form answers. If surveys are conducted by enumerators in the field using mobile phones or tablets, software provide options covering traditional survey questions such as multiple choice and ranking. Digital surveys can also be created with "required questions" which must be completed before the enumerator or survey participants can continue with the survey, ensuring integral information is collected.

If surveys are to be conducted via mobile phones and through tablets, the right technology must be purchased to be able to download the necessary and appropriate software. Choosing which device to use for digital survey activities is very important and the following are major points to consider:[64]

- **Operating climate and natural elements**: Sensitive tools such as high-tech tablets may react adversely to heat, moist climate and the presence of dust and sand. Long distances and long hours of use without access to energy for battery refills also need to be considered.
- **Safety and security aspects:** Expensive new tools may put researchers (and the data stored in the devices) at risk, as field workers can be the target of robberies and assaults when using these devices. Smaller or less high-tech devices such as prepaid mobile phones can be used to reduce these risks.
- **Complexity of the information to be collected:** Simple surveys that focus on a few straightforward questions can easily be implemented via pre-paid mobile phones. More complex questionnaires (i.e. with skip/ignore functions and mandatory vs. non-mandatory questions) may be impossible to adapt to a mobile phone and require tablets or smartphones.
- **Access to the Internet:** Accessing the internet via mobile phone networks is also an important function in order to upload data 'live' and avoid loss and security issues. Filled questionnaires can be immediately sent to the home server or kept in the cloud – and erased from the hardware. Live follow-up on questionnaire completion and evolution of the application of the survey is also facilitated via Internet access.

There is a wide range of software available for digital surveys, including open source and licensed tools requiring purchase. Before buying any software, it is important to consider the costs linked to regulations of licenses, the level of technical support which will be required- as determined by the level

[63] Rosero-Bixby et al. "Improving the Quality and Lowering Costs of Household Survey Data Using Personal Digital Assistants (PDAs). An Application for Costa Rica." University of Costa Rica, 2005; Yu et al. "The development and evaluation of PDA-based method for public health surveillance data collection in developing countries." *International Journal of Medical Informatics*. 2009; Tegang et al. "A comparison of paper-based questionnaires with PDA for behavioral surveys in Africa: Findings from a behavioral monitoring survey in Kenya." *Journal of Health Informatics in Developing Countries*. vol.3 no.1. 2009: 22-25; Escobal and Benites. "PDAs in socio-economic surveys" instrument bias, surveyor bias or both?" *International Journal of Social Research Methodology*. Vol.16, no.1. 2012: 47-63; Fletcher et al. "Handheld Computers: A Feasible Alternative to Paper Forms of Field Data Collection." *Evaluation Review*. vol. 27, no.2. 2003.

[64] See *Mobile Technology Handbook* from Pact for more information on device selection.

of ICT knowledge within the organisation- as well as the programming knowledge needed during the implementation of the survey.

When deciding to implement a survey (paper-based or digital), organisations need to consider whether a quantitative approach will provide them with the answers they are looking for; complex, changing and dynamic phenomena may not necessarily best be captured with a survey, rather, complementary qualitative approaches should be considered to verify the workings of a theory of change within complex settings.

However, digital surveys provide excellent advantages to respond to some of the challenges identified in this paper. For example, the **near real-time availability of data can immediately feed into other aspects of complex programmes, enhance how evidence is combined, and produce more sector-wide datasets that can be easily exchanged**. Furthermore, exchange of data with stakeholders and specialists when special interpretation is needed is easier when information is already in digital format and **enhances the quality of the entire M&E process** (i.e. military specialists to explain particular security aspects of responses and results).

Resources Available:

Formhub, Kobo Toolbox, Magpi, and QuickTapSurvey are used for developing, collecting, and analysing digital surveys.

Computer-assisted personal interview (CAPI) applications are software for developing, conducting, and analysing surveys and interviews in digital form. Those assessed in the IRIS study, mentioned above, are: BLAISE, Computer-assisted Survey Methods Program (CASES), CSProX, Entryware, Multimode Interviewing Capability (MMIC), Open Data Kit, Pendragon, and Surveybe.

B. Data Visualization

Introduction

The peacebuilding evaluation sector is at a critical crossroads. On the one hand, the sector has created the foundation of intellectual and practical guidance on M&E. The number of champions of M&E systems within donors and organisations has also increased, which is helping to shift organisational cultures and reducing the barriers and perceived 'fear' of evaluation. More practitioners are participating in international evaluation conferences, organisations are commissioning more evaluations with alternative evaluation approaches, and there is demand for increased capacity strengthening by staff across all levels of organisations. On the other hand, there continues to be disillusionment with the quality of monitoring and evaluation processes being implemented in fragile and conflict-affected environments. The quality of evaluation reports continues to be low – failing to meet best standards set by the OECD-DAC and the American Evaluation Association. When there is evidence and data in monitoring and evaluation systems that measure the changes produced by programmes, it is not presented in a user-friendly format that enables use and reflection by participants, staff, and donors.

The tools outlined below will not necessarily directly increase evaluation use. In fact, at the core, more evaluation findings need to be shared more widely with all key stakeholders — including with programme participants, between peer organisations, and within donors. The findings of what worked and what did not work must also be presented in ways that help individuals and organisations understand the information, share lessons learned, make decisions, and continue to evolve. This is where the tools outlined below have the greatest potential.

Technology will not inherently lead to more sharing, but it can help in displaying information to meet everyone's learning needs, particularly the needs of visual learners and individuals with low literacy levels. Technology also has enabled and created a range of platforms where information and lessons learned can be shared more easily and widely. There are now evaluation databases, peacebuilding M&E webinars, multi-media video sites, and social network platforms. It is now up to humans to change their own behaviours, perspectives, and fears, to work towards creating organisational cultures that celebrate both successes and failures in programmes. Donors and organisations must recognize that it is only through collaboration and the use of existing platforms that enable sharing and learning that peacebuilding evaluation practice can grow and flourish and eventually address some of the structural challenges within M&E.

Tool: Data Visualization

Data visualization is the creation of an image depicting qualitative or quantitative data, communicating a message. The primary purpose of data visualization is to make data more accessible and engaging for targeted or a wider range of audiences. It also serves to remove the signal from the noise of extra data, clarifying the message being conveyed.

Figure 1: Word Cloud Example

Most of the different types of data visualization are created via the utilization of design websites and software. Here is a list of the most common types of data visualization that are being used in peacebuilding:

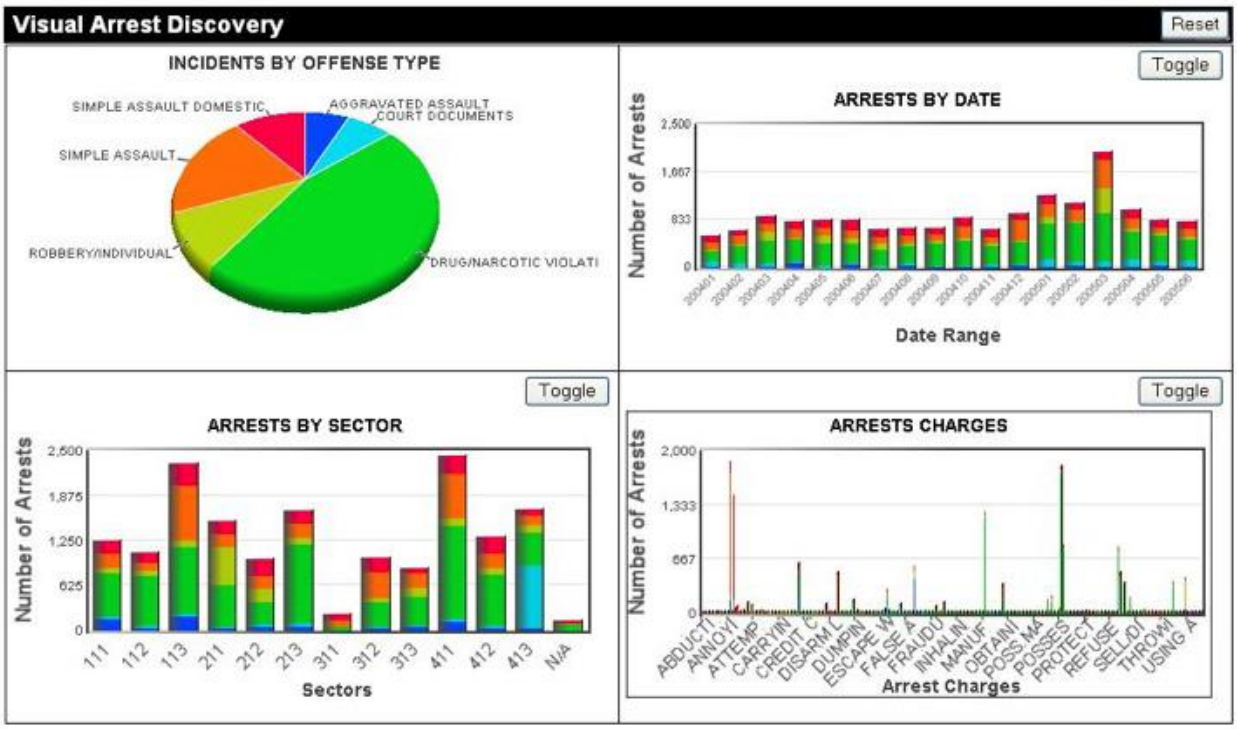
- **Infographics** are an increasingly popular data visualization tool to present both qualitative and quantitative data. They are one-page (or webpage) communication tools depicting a single topic using several elements including graphs, diagrams, and illustrations. Infographics are easily shared and reproduced via mobile, newspaper, and Internet mediums. A sample infographic can be found on page 30.
- **Quantitative data** is often best presented using **simple charts** such as bar charts, line graphs, scatterplots, spark charts, heat maps, bubble charts, tree maps, and stack graphs.[65] New technologies now allow users to interact with data online, creating their own charts from data provided, analysing the results themselves. Organisations can load this technology on their websites to increase access and interaction with data.
- **Qualitative data** collected during interviews can be presented focusing on words and phrases. When focusing on words, evaluators can create **word clouds**[66], can compare word clouds, and can link words to phrases to create context. If an evaluator chooses to focus on presenting phrases, **word trees**[67] and **phrase nets**[68] can be used to show word pair connections and context for word use.
- **Dashboards** are an interface designed to present information for several indicators, usually relating to a common underlying topic or concept, in an easily understood manner on a single screen; dashboards are a highly interactive form of data visualization. Some dashboards also allow users to disaggregate large data sets into smaller subsets, which may be difficult and time consuming to do without this interactive tool.
- **Video** can be used to record complex and difficult to explain processes, showing the interplay among participants from start to finish for evaluation. This is especially useful for the evaluation of social interactions and the evaluation of behaviour and attitude change. Video may also be applied, and following ethic and research ethics, in ethnographic M&E process.

How have Data Visualizations been used for M&E purposes in Peacebuilding? There are many different types of data visualizations, as discussed above. They can all be used to **increase interaction with programme participants** and **increase access to programme information** for a broader audience. Traditional visualizations such as graphs are often included in organisations' reports, evaluations, and case studies. However, the majority of report content is text, which is often technical, creating a barrier between organisations and their participants. UNDP Cyprus has created Mahallae, a civic action road map with stories and information promoting peace and civic engagement presented using data visualizations. The information for these visualizations is submitted by community members and then analysed and shared using easy-to-understand visualizations.

Interactive dashboards allow programme managers to **display data** from one particular region, or provide a comparison between two regions of focus. By giving users the **ability to interact with the data**, they are able to quickly and simply move between different views and presentations of that data and detect patterns that may not be easily apparent through the examination of an entire data set. AidData by Development Gateway is an online source of data specifically curated for international development actors. The data is presented as an online dashboard and provides stakeholders, donors, and development actors the opportunity to sift through information relevant to their programming. The goal of this project is to support the creation of more sustainable and effective programmes through the provision of information and interaction with that information.

[65] "Developments in Quantitative Data Display and Their Implications for Evaluation." In T. Azzam & S. Evergreen (Eds.), *Data visualization, part 1. New Directions for Evaluation* 2013: 35
[66] Word cloud: a visual representation of keywords within selected text.
[67] Word tree: a visual representation of connections between words within selected text.
[68] Phrase net: a diagram representing relationships between words within a selected text.

Figure 2: Example of Justice Sector Dashboard



Why do we like Data Visualization?

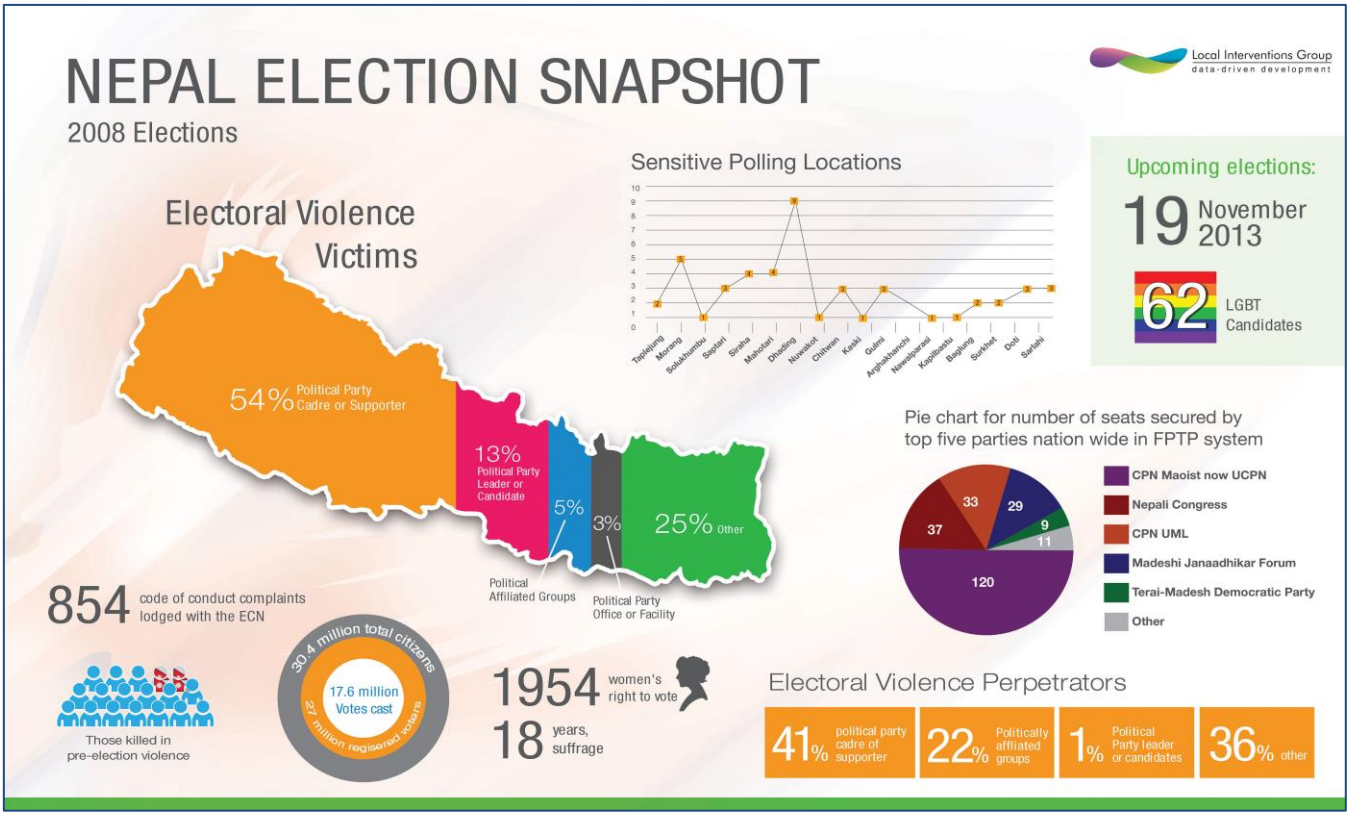
- **Allows for better sharing of results:** Monitoring and evaluation is very technical in its language and reporting, but data visualization offers an opportunity for information and results to be presented and used by a wider audience. For example, visualizations allow illiterate communities to participate more fully in M&E processes. Making data more accessible is an integral step to increasing evidence-based decision making.
- **Helps tell a better story**: Peacebuilding work is complex and has impacts on inter-related elements, resulting in large quantities of data needed in order to tell a complete story of the context during conflict assessments or in peacebuilding evaluations. Graphics are more approachable than a large data set or long, dense reports.

Overall there are three main reasons why data visualization techniques are becoming popular in the international development sector, including the peacebuilding sector. First, data visualization helps practitioners; programme beneficiaries, donors and evaluators **comprehend and interpret patterns** that may be difficult to identify. After all, data visualizations can also present vast amounts of data in one graphic, summarizing inter-related concepts and findings. For example, the infographic below displays a variety of data from the 2008 elections in Nepal, highlighting election violence and vulnerable populations.

Second, data visualizations can **increase participants' interaction with data**. Interactive conceptual models provide viewers avenues to actively interact with data. Users can follow the programme's activities through to outcomes and indicators by clicking on their area of interest on the visualization.[69] For example, web-based visuals allow users to interact with data and for evaluators to provide access to massive and complex data sets using a medium that is more understandable and approachable for stakeholders. Viewers can click through data or can choose to investigate a finding in more depth using interactive online data visualization presentations. These elements of data visualization support decision-making and use-focused M&E practices.

[69] "Data Visualization and Evaluation." In T. Azzam & S. Evergreen (Eds.), *Data visualization, part 1. New Directions for Evaluation,* 2013: 14.

Figure 3: Infographic of 2008 Nepal Election Data[70]



Finally, by having better comprehension of and interaction with data, the field of peacebuilding is hoping that the data that is being collected through conflict assessments, baselines, monitoring systems, and **evaluations is used more frequently**. If practitioners find a way to better use the data being collected, they will be able to address one of the underlying challenges of peacebuilding evaluation.

What to keep in mind when using this tool? Not all aspects of peacebuilding evaluations can be presented in the form of data visualizations or dashboards. Sometimes narrative and storytelling are better suited to describing the change in a community. To identify which parts are conducive to visualization, identify the critical programmatic change or result that needs to be highlighted. The data must also be balanced with the context, content, and the relative importance of the information being presented.

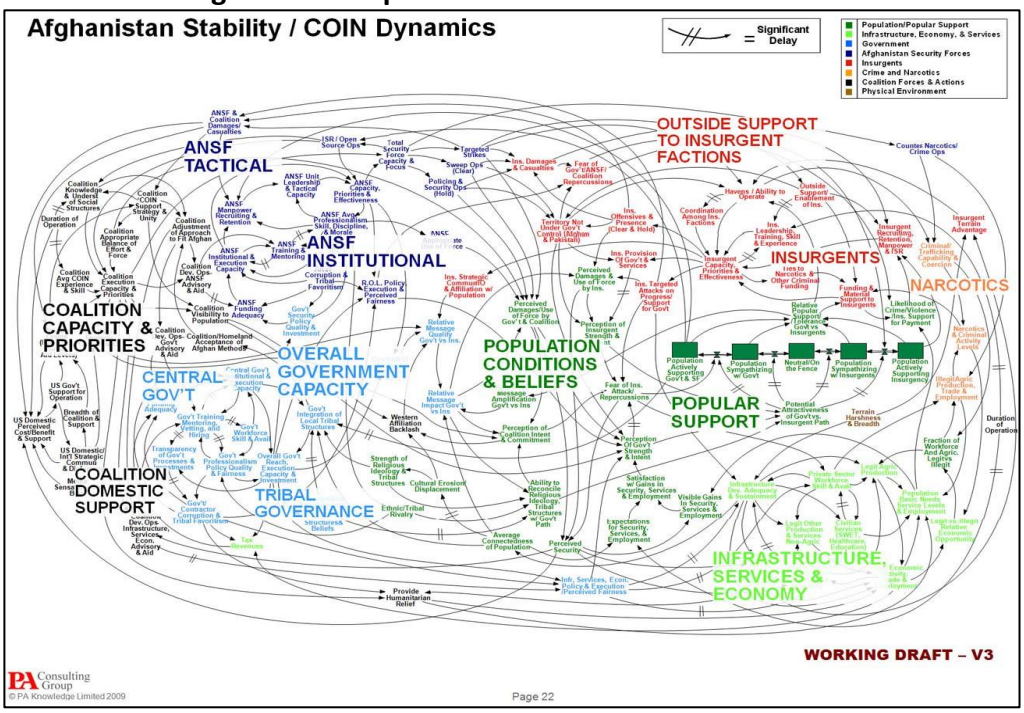
There is growing pressure to keep reports short, concise, and to the point. Data visualization tools can provide short cuts to lengthy narratives. However, when presenting information, it is important not to over-simplify complex concepts or contexts. Therefore, strong analysis about context, conflict, and programme outcomes must accompany data visualization tools that summarize qualitative and quantitative findings.

Much like traditional methods and in reports, it is important to ensure that the information presented in data visualizations is clear and reliable. For example, the Afghanistan Stability/COIN Dynamics map below (page 31) is confusing to decipher, static, and intimidating to approach. Unclear data can lead viewers to misinterpret data and mislead readers, leading to distrust and undermining the inherent participatory nature of peacebuilding activities. Therefore, it is important to limit the data presented to ensure that the evaluation's message and findings are discernable to the audience.

[70] Local Interventions Group. *Nepal Election Snapshot*. http://www.localinterventions.org.uk/programmes.php?post=22 (accessed April 4, 2014).

Unreliable data visualizations may include data that has missing values or has unrepresentative samples. Therefore it is important to ensure that when representing data visually, the accompanying limitations are footnoted or outlined on the website or in the report. Images and visualizations should also be carefully examined to be sure they are not misleading, as people can infer different things from the same image; simple and direct graphics are best to convey information.

Figure 5: Example of a Weak Data Visualization[71]



Resources available to create data visualizations:

Analytics Software – DoView, Spotfire, JMP, and Tableau process data sets and allow for creation and customization of data visualizations. Google Fusion Tables are an online option for manipulating large data sets and creating data visualizations (a Gmail account is required for this service).

Infographics – Visual.ly and Easel.ly provide templates to create and share infographics on- and offline.

Word Clouds – Wordle and Tag Crowd are free, online tools to create word clouds from your text.

Dashboards – Activity Info, DevResults, DHIS 2, FileMaker Pro, MS Access, Newdea, and Quickbase are software available to create and manage databases.

Free Online Data Visualization Tools – Many Eyes is a free, online tool to create a variety of visualizations from your data set, or a data set that has already been uploaded by another user. Microsoft Treemapper is a free download, for use with Excel spreadsheets to create treemap-style data visualizations. NodeXL is a free, open-source template for Excel, designed to make it easy to explore network graphs within the Excel format.

For a list of more data visualization tools please visit AEA, Better Evaluation, AEA365, and DataVisualization.ch. To discuss data visualizations further, visit visualizing.org.

[71] Engel, Richard. "So what is the actual surge strategy?" *NBC News World Blog*. December 2, 2009. http://worldblog.nbcnews.com/_news/2009/12/02/4376696-so-what-is-the-actual-surge-strategy (accessed April 4, 2014).

Chapter 3: Conclusion

This paper has presented a number of tools, approaches, hardware, and software that have the potential to close some gaps around some of the existing programmatic and structural challenges of monitoring and evaluating peacebuilding programmes. It has tried to present as many examples and case studies as possible and the author encourages the reader to follow links and resources to become more familiar with each tool, and the numerous other new technology advances.

In summary, ICTs for M&E have the potential to make a contribution towards addressing monitoring and evaluation process in the following areas:

- **Rapid and Near Real-time Monitoring**: In changing and evolving contexts, new technologies provide opportunities to conduct real-time monitoring of conflict dynamics and conflict drivers. New technology can be used to collect, analyse, and publish information more rapidly than with traditional methods. By utilizing mobile phones and tablets, instead of paper-based or analog methods, data can be quickly processed, particularly when coupled with data analysis software and data visualization techniques (see page 11 and 23).[72] Mobile and Internet networks, as well as the digitization of the collection process, can increase speed and efficiency in data collection. Incorporating these new technologies can reduce time-delays, inefficiencies, and improve data quality by reducing data entry and human errors.
- **Different Type of Data to Assess Effective Programming:** New technologies provide peacebuilding practitioners with the opportunity to collect a wide range of data points, including sounds, pictures, and videos demonstrating participants' behaviour in action. The different data points can help practitioners analyse the complexity of a conflict through different lenses and ultimately uncover new patterns of information. The ability to *geo-code*[73] surveys and superimpose information on maps may improve practitioners' abilities to analyse and interpret a conflict (see page 14). Another example is the use of social media and big data analysis to monitor the intensity of a conflict, or to learn about the perspectives and attitudes of certain demographics more systematically over time (see page 14 and 18). If these types of new technologies are applied, new relationships between programme outcomes and conflict drivers may be easier to monitor. It is the hope that, over time, the contribution of specific programmes and activities to local or national conflict resolution processes, and peace writ large, may also be better articulated in evaluations.
- **A Chance to Track Indicators More Systematically:** Tracking culturally appropriate and context-specific indicators over time, systematically to speak to aggregated outcomes and impacts may be done more effectively with new technologies. Dashboards and maps are better able to visualize numerous indicators to tell a story of change, making information more accessible to a broader range of viewers. However, to do so, peacebuilders must integrate comprehensive knowledge management and data storage systems that utilize online and offline capabilities to more systematically track information. In addition, to be able to aggregate indicators, organisations and donors need to openly share data and standardize methodologies and indicators. This will enable practitioners to use proxy indicators more readily and reduce the burden of data collection on populations. As Claude Brudelein and Suneeta Kaimal argue "...the

[72] Smith, Gabrielle, Ian Masaulsan, Saul Butters, & Mathieu Tromme. *New Technologies in Cash Transfer Programming and Humanitarian Assistance*. Oxford: Cash Learning Partnership, 2011: 29; Robertson, Andrew & Steve Olson. *Using Data Sharing to Improve Coordination in Peacebuilding.* Washington, D.C.: The National Academies Press, 2012.
[73] Geo-coding: the process of finding and assigning geographic coordinates (i.e. street address, latitude and longitude, etc.).

ever-expanding circles of actors engaged in peacebuilding require new patterns of information management, where technology is called upon to play a major role."[74]

- **Potential Cost Saving**: New technologies are seen as cost-saving M&E strategies. Utilizing some of the tools in this guidance paper has the potential to decrease costs associated with transportation, printing, data entry and cleaning, coding, and staff hours. Some new technologies, such as the utilization of tablets and mobile phones, have an initial operational and infrastructure cost, but thereafter costs can be kept relatively stable for some time. For example, an estimate from the Small Arms Survey indicates that purchasing one device per enumerator for 40 interviewers and 10 supervisors may be lower than the sum of the costs for printing 2,500 questionnaires, transporting them back to the data entry site, and recruiting 10 data entry staff for 10 days.[75] There is also increasing access to software available for free or very low cost, which is highlighted throughout this paper.
- **Opportunity to Increase Capacities and Collaboration:** New technologies are also enabling the increase in capacity of all staff related to monitoring and evaluation systems, whether of existing social science or new technology tools. The Internet has provided a platform to enable the easy sharing of a wide range of documents, interactive trainings, and manuals on M&E. Centralized websites, such as the DM&E for Peace Learning Portal, provide a hub for resources and bring M&E thought leaders together to discuss data collection tools and monitoring and evaluation findings from the peacebuilding sector. Other online M&E hubs also include: Better Evaluation, the American Evaluation Association, Global Hive, and MyM&E. They share capacity building opportunities not only about monitoring and evaluation processes but also about how to utilize new technology. From the *technology* sector, Tech Salon, SciDev, ICT4Peace Foundation, and CrisisMappers provide a community of humanitarian and development peers attempting to solve similar challenges with new technology that are being faced by the peacebuilding sector. Software providers themselves also provide help and support when it comes to installing, using, and integrating new technologies. These existing communities have the potential to lead to strong discussions on key questions related to how to overcome M&E challenges in conflict and fragile environments.
- **Potential Increase of Use through Better Data Visualization:** Data visualization software that is available for free or low-cost enables practitioners to visualize data with more ease. It is the hope that as practitioners and evaluators learn how to use these visualization tools that information is presented in more consumer-friendly and engaging formats that enable evaluation use and evidence-based decisions. The incorporation of low-cost video and self-documentaries into evaluation process may also enable the sharing of information with programme participants that are illiterate. This format, if conducted according to evaluation guidelines and ethics, may also help better integrate programme participants into the validation of findings that has generally been shared through lengthy and dense reports.
- **Greater Engagement with Participants**: Overall, organisations and donors must continue to strive to share more evaluation reports and data sets with participants and the overall sector. While reports are increasingly published online, making them more accessible to global audiences, researchers and practitioners must ensure that the data collected leads to more in-depth conversations with communities experiencing conflict. For instance, practitioners must be more diligent about enabling remote monitoring officers and populations at large to participate in the analysis and use of data collected. Findings must be shared and validated with remote and vulnerable communities. When data is collected via social media platforms it must be shared back with those using social media platforms and populations at large. This does not mean that data collected using technology, for example mobile phones, but be shared back via mobile

[74] Bruderlein, Claude & Suneeta Kaimal. "From Information Overload to Informed Decision: Designing and Information System to Support Peacebuilding." *Journal of Peacebuilding & Development,* vol.4, no.2, 2008: 95-99.
[75] Nowak, Matthias. (July 2013). Email Interview.

phones. For instance, evaluation findings can be shared back through radio programming, news casting, dialogue processes, video-conferences, recorded YouTube videos, photo essays, and more. The means are less important than the act of sharing systematically, ethically, collaboratively, and openly. It is perhaps in this capacity that technology can be of instant assistance and can immediately produce effects, without need for any further technological development or large investments of organisational resources. The technology for sharing results with participants exists, now it just has to be applied consistently and more widely.

While there are many real and perceived advantages to utilizing new technology in M&E systems, there are some considerations that practitioners and monitoring and evaluation staff must be aware of. As argued by Anne Kahl and Helena Puig Larrauri, there are inherent tensions and limitations that come with using new technologies in fragile and conflict-affected states.[76] These considerations outlined below can be mitigated, but when they cannot – then donors and organisations may opt that the integration of ICTs into the M&E process is inappropriate.

- **Systematic Bias or Errors:** New technologies may bring about *systematic bias*[77] to the conflict assessment, monitoring tool, or evaluation process. More research will increase our understanding of whether collecting data via tablets and mobile phones in isolated places alters the way in which individuals answer questions related to safety, security, or concepts related to good governance. Some studies have shown that respondents may be apprehensive in answering surveyors with tablets for reasons such as intimidation, fear of having their identities exposed, or a desire to have opportunities to use the technology themselves.[78] As more organisations are utilizing new technologies, they must also work with researchers and academics to add to the literature of whether technology increases systematic bias or errors.
- **Selection Bias:** While new technologies can lead to having more information more rapidly, there is a risk that only utilizing ICT methods (i.e. survey via SMS and social media) can make it more difficult to be inclusive of all stakeholder groups during data collection. For example, lack of consistent access to Internet and limited mobile phone coverage may increase *selection bias*[79] on M&E systems. After all, more vulnerable, lower income, rural and older populations may not have the same level of access to social media platforms or access to mobile phones as younger and more urban populations. Generally women also have less access to technology than men in developing contexts. Given that perceptions of conflict and peace may differ widely based on an individual's personal identity, demographic information, or where they live – it is important to be as inclusive and participatory as possible during data collection exercises. Therefore, in conflict and fragile states, practitioners are encouraged to use a mixed-methods approach that relies not only on a balanced data collection approach between qualitative and quantitative tools, but also on a sensible combination of traditional data collection tools and other technologies, such as social media analytics and mobile communications (see page 11 and 20**).**
- **Safety and Security:** Practitioners operating in fragile and conflict-affected environments are more aware of their surroundings and usually have a heightened sense of the safety of staff and programme participants. When it comes to any data collection process, and particularly when it involves new technologies, organisations must take steps to provide for the safety of the individual or community providing information. In addition, when working with new technologies, organisations must be aware of additional precautions.

[76] Kahl, Anne & Helena Puig Larrauri. "Technology for Peacebuilding." *Stability: International Journal for Security & Development*, vol.2, no.3, 2013: 1-15.
[77] Systematic Bias: are bias in measurement which lead to the situation where the mean of many separate measurements differs significantly from the actual value of the measured attribute.
[78] Pact. *Mobile Technology Handbook*. Pact, Inc., 2014: 14.
[79] Selection Bias: a statistical error in choosing participants or groups for a study that causes a bias in the sample.

- For example, data must be stored and reported in a way that ensures that the source of information is anonymous and the safety of participants is not compromised if there is a change in the conflict dynamic. There are various data management platforms that allow for data encryption and it is necessary for organisations to clearly assess their need for data protection and choose their platform accordingly. Without proper security of data, systems may be hacked and information may be used against individuals.
- Furthermore, as Anne Kahl and Helena Puig Larrauri argue "practitioners [also] have an ethical responsibility to **ensure that people are aware of the risks they take in sharing information over a particular technology**."[80] For instance, data sent over mobile networks or over the Internet may not be secured. Individuals must also give consent when their photo is taken and understand how the organisation will use the photograph be it in an online publication, success story, or live on the web for some years to come. Individuals and organisations publicly sharing information must take precautions to ensure that quotes, photos, or activities do not put individuals, partners, or communities at present or future risk.

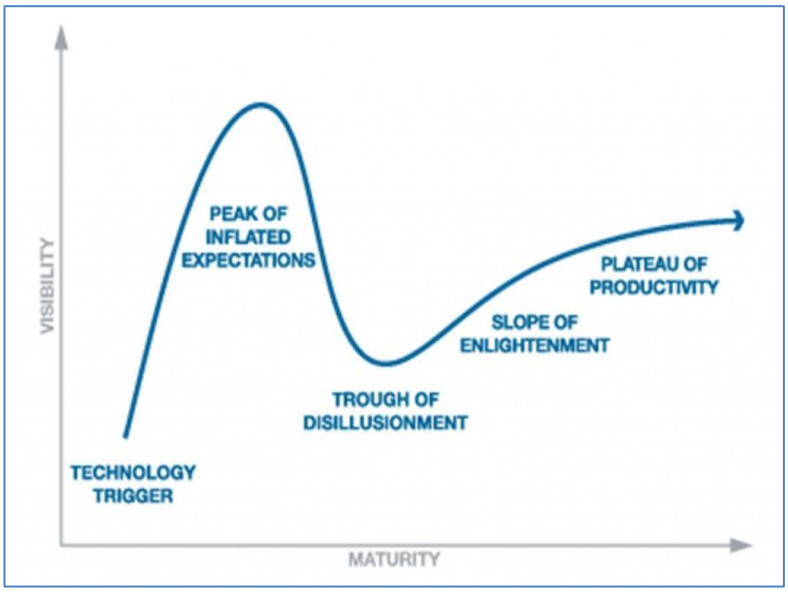
- **Training:** While there is a lot of interest in new technologies due to some of the advantages outlined above, organisations must be aware of some of the potential steep learning curves that accompany learning, installing, and testing ICTs. As new technologies are updated there is a continuous learning process. This means that it is important for inclusion of adequate staff development training in budgets and support from Information Technology departments. Furthermore, not all ICTs are available in local languages. This makes it more difficult for field-based staff to engage with the platforms and also seek assistance from help-desk functions. Therefore, as the range of new technologies and approaches are developed for monitoring and evaluation purposes, the ICTs must be made available in a range of languages.
- **Plan for Logistics:** In order for ICTs to function they may need additional infrastructure and logistical support, compared to traditional pen and paper approaches. Practitioners must plan accordingly and have a strategic plan in case mobile phones or tablets get stolen, lost, or have technological malfunctions. The data collection team must also plan accordingly for when and where, and how long devices must be charged. In fragile and conflict-affected environments, when electricity is not reliable, data collection teams must have substitute plans available. This means that platforms and tools must have offline capabilities and organisations much choose platforms (including knowledge management and data storage) considerate of the needs of the entire organisation.
- **Inconsistent Application of Social Science Methodologies**: While the peacebuilding and international development community has made significant progress in strengthening capacity in data gathering and research, many social science methodologies (even basic interviews and focus groups) are not consistently applied in accordance with best practices. When new technologies are incorporated into these processes, including the digitization of data collection, there is the need for further training not only on the application of new technologies but also on basic best practices. The introduction of ICTs is not a viable excuse for not having thought through sampling methodology, reducing bias in questionnaires, and proper data collection practice. When providing training on the use of technology, refreshers on basic data collection skills and best practices must also be incorporated.

After reviewing the literature, conducting interviews with peacebuilding organisations and technology experts, analysing the case studies and examples – **where is the peacebuilding sector at in terms of adoption of ICTs for M&E purposes?**

[80] Kahl & Laurrauri, "Technology for Peacebuilding."

To answer that question, lets introduce the Hype Cycle – a process of learning, struggle, and development in the technology arena.[81] The five-phase Hype Cycle begins with a new idea or concept developed (*technological trigger*) and is followed by a phase of excitement about the technology's perceived or real benefits (*peaks of inflated expectations*). The next phase develops as users of the technology recognize some of the limitations of the technology (*trough of disillusionment*). A slow but steady progression to truly understand the potential of the technology leads to a *slope of enlightenment* to finally reach a *plateau of productivity*. [82]

Figure 6: The Hype Cycle



Given the resources and the cases examined for this paper, the use of new technology in monitoring and evaluation in conflict and fragile states may be somewhere between a peak of inflated expectations and trough of disillusionment. While some peacebuilding organisations have adopted new technologies, most have not. There have been some successful cases of monitoring and evaluation with these technologies (particularly around mobile technology and digitization of surveys), but they have come with steep learning curves, particularly for national or smaller international NGOs. At the time of this paper's publication, the rest of the ICTs outlined in this paper are mainly ideas and concepts that are currently being tested and studied, particularly around social media analysis and big data. Data visualization methods may be the tools that can most rapidly be applied and lead us to a plateau of productivity in the shortest amount of time.

To ensure that peacebuilding practitioners do not contribute to the hype cycle, it is important to focus on monitoring and evaluation objectives and needs. Start by identifying and being clear about (1) what are the changes that programmes hope to produce (2) what changes need to be measure and what data is already available, (3) what does the field of peacebuilding need to learn about a conflict, context, or programmatic approach in order to add to the body of literature. It is only by having these questions clearly answered that practitioners and donors can ask themselves: *Is it appropriate to integrate ICTs into the monitoring and evaluation process? If yes*, *how and when can ICTs be used to enhance the process of data creation, collection, analysis, use, and storage?*

In conclusion, dialogue must be sustained to continue to explore how new technologies can be integrated into M&E systems to collect, analyse, and disseminate information. As time progresses, and new technologies become available and some of the technologies in this paper become out-dated or obsolete, it will become apparent to practitioners how to be productive and easily identify the most appropriate tool (traditional or new) to monitor in near real-time and evaluate programmes that strive to contribute to peace.

[81] Garter. "Interpreting Technology Hype." *Research Methodologies.* http://www.gartner.com/technology/research/methodologies/hype-cycle.jsp (accessed April 4, 2014).
[82] Ibid.

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Appendix A: List of Hyperlinks

For those accessing this paper in hardcopy, the list below provides an exhaustive list of the web addresses of all hyperlinks in this paper. The links are listed in alphabetic order and are listed exactly as they appear in the report's text. These links represent resources, reports, programmes, and organisations. Please explore them to learn more about available ICTs for use in monitoring and evaluation.

Activity Info http://www.activityinfo.org/

AEA http://comm.eval.org/DataVisualizationandReporting/tigresources/websitescombined

AEA365 http://aea365.org/blog/corey-newhouse-on-using-video-in-evaluation/

African Union http://au.africadata.org/

AidData http://aiddata.org/

American Evaluation Association http://www.eval.org/

ArcGIS https://www.arcgis.com/features/

Benetech http://www.smithsonianmag.com/history/a-human-rights-breakthrough-in-guatemala-138629807/?no-ist

Better Evaluation http://betterevaluation.org/ (network) & http://selection.datavisualization.ch/ (visualizations)

BLAISE http://www.blaise.com

Comparative Assessment of Computer-Assisted Personal Interview (CAPI) Software Packages http://web.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTLSMS/EXTSURAGRI/0,,contentMDK:22939078~pagePK:64168445~piPK:64168309~theSitePK:7420261,00.html

Computer-assisted Survey Methods Program http://cases.berkeley.edu

CrisisMappers http://crisismappers.net/

CSProX https://www.census.gov/population/international/software/cspro/

Data Catalogues http://datacatalogs.org/

DataVisualization.ch http://selection.datavisualization.ch/

Demographic and Health Surveys http://dhsprogram.com/

Designing for Results http://www.sfcg.org/programmes/ilt/ilt_manualpage.html

DevResults http://devresults.com/en/p/home

DHIS 2 http://www.dhis2.org/

DM&E for Peace Learning Portal www.dmeforpeace.org

DoView http://www.doview.com/

Easel.ly http://www.easel.ly/

Egypt http://irevolution.net/2011/01/29/crisis-mapping-egypt;/

Elva http://www.undp.org/content/undp/en/home/ourwork/crisispreventionandrecovery/successstories/in-georgia_s--text-messages-help-create-community-safety-network/

Elva Platform http://www.elva.org/

Entryware http://www.confirmit.com

Episurveyor http://www.datadyne.org/episurveyor/

European Union http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/

Eyes on Syria http://www.eyesonsyria.org/

FileMaker Pro http://www.filemaker.com/

First Mile Geo https://www.firstmilegeo.com/

Formhub https://formhub.org/

Frontline SMS http://www.frontlinesms.com/

GDELT http://gdeltproject.org/

Geofeedia https://geofeedia.com/

Global Hive http://globalhive.ca/

Google Analytics http://www.google.com/analytics/

Google Crisis Map http://google.org/crisismap/weather_and_events

Google Earth http://www.google.com/earth/

Google Fusion Tables http://www.google.com/drive/apps.html#fusiontables

Haiti http://newswatch.nationalgeographic.com/2012/07/02/crisis-mapping-haiti/

Hatebase http://www.hatebase.org/

HootSuite https://hootsuite.com/

IBM http://www-01.ibm.com/software/data/bigdata/ (big data) & http://www-01.ibm.com/software/analytics/solutions/customer-analytics/social-media-analytics/ (social media)

ICT4Peace Foundation http://ict4peace.org/

JMP http://www.jmp.com/

Kenya http://blog.ushahidi.com/2013/02/11/uchaguzi-kenya-2013-launched/

Kobo Toolbox http://www.kobotoolbox.org/

Libya https://groups.google.com/forum/#!topic/dvm-jobs-emplois/E7p4IOy_mVE

Magpi & Magpi/Data Dyne http://www.datadyne.org

Mahallae http://mahallae.assyst-uc.com/peacemap-activity

Mail Agent http://agent.mail.ru/

Many Eyes http://www-958.ibm.com/software/analytics/labs/manyeyes/

Media Cloud http://www.mediacloud.org/dashboard/view/1?q1=94946

Meme Tracker http://www.memetracker.org/

Microsoft Treemapper http://microsoft-treemapper.software.informer.com

Mobile-based Technology for Monitoring and Evaluation http://www.theclearinitiative.org/mobile-basedtechnology.html

MS Access http://office.microsoft.com/en-us/access/

Mxit http://get.mxit.com/

Multimode Interviewing Capability http://www.rand.org/labor/mmic.html

MyM&E http://www.mymande.org/

Newdea http://www.newdea.com/

Nigeria http://www.sfcg.org/programmes/ilt/evaluations/nigeria.html

NodeXl http://nodexl.codeplex.com/

OECD-DAC Guidance http://www.oecd.org/dac/evaluation/evaluatingconflictpreventionandpeacebuilding.htm

Open Data Kit http://opendatakit.org/

Open Street Map http://www.openstreetmap.org/

Pact Mobile Technology Handbook http://www.pactworld.org/blog/pact's-mobile-technology-handbook-debuts

Paris Declaration http://www.oecd.org/dac/effectiveness/parisdeclarationandaccraagendaforaction.htm

Partners for Peace http://www.p4p-nigerdelta.org

PeacebuildingData.org http://www.peacebuildingdata.org

Pendragon http://www.pendragonsoftware.com

Piwik http://piwik.org/

QCRI http://www.qcri.org.qa/

Quantum GIS http://www.qgis.org/en/site/

QuickBase http://quickbase.intuit.com/online-database/quick-database

QuickTapSurvey http://www.quicktapsurvey.com

Rapid SMS http://www.rapidsms.org/

SAS http://www.sas.com/en_us/software/customer-intelligence/social-media-analytics.html

SciDev http://www.scidev.net/global/

Social Mention http://www.socialmention.com/

Spotfire http://spotfire.tibco.com/

Sudan http://irevolution.net/2011/01/30/protest-map-of-khartoum;/

Surveybe http://www.surveybe.com/index.php

Syria http://www.humanitariantracker.org/#!syria-tracker/cj00

Tableau http://www.tableausoftware.com/

Tag Crowd http://tagcrowd.com/

Tanzania http://blog.ushahidi.com/2010/10/28/uchaguzi-monitoring-the-tanzania-elections/

Tech Salon http://technologysalon.org/

Text to Change http://texttochange.org/

The Standby Task Force http://blog.standbytaskforce.com

Ukraine http://globalvoicesonline.org/2012/10/26/ukraine-crowdmapping-election-violations/

UN Global Pulse http://www.unglobalpulse.org/

University of Berkley http://www.law.berkeley.edu/11979.htm

US Bureau of Statistics and Labour http://www.bls.gov/data/

Ushahidi http://ushahidi.com/

Visual.ly http://visual.ly

visualizing.org http://visualizing.org/

WeChat http://www.wechat.com/en/

Wordle http://www.wordle.net/

World Bank http://data.worldbank.org/

Yahoo Pipes http://pipes.yahoo.com/pipes/

Appendix B: Mobile Data Collection Software

Below are two tables detailing and comparing information on data collection software. This software can be used on a variety of hardware devices such as mobile phones and tablets. Review this table as a first step during your software selection process and research.

Figure 7: Highlights of Key Mobile Platforms

Mobile Platform	Type of Phone	Data Entry Interface and Transmission	Survey Setup	Data Storage, Analysis, and Reporting	Other Features	Price Structure
Mobenzi	Java, Android, BlackBerry	Uses Java forms	Do-it-yourself and survey support available; skip logic	Storage in cloud server; data filtering; maps GPS data	Supports multiple languages; collects image and GIS data; SMS communication with data collectors	Pay-as-you-go; roughly USD$0.01 per data field
CommCare	Java, Android	Uses SMS (paid plans), forms, or Web portal. Transmission: SMS (paid version), GPRS.	Do-it-yourself and paid survey support available	Storage in cloud server; free version includes standard reports	Supports multiple languages, skip logic (requires coding skils); collects audio, video, images, and GPS export into Excel possible	Free version allows for up to 50 mobile users; paid plans USD$100 to USD$1,000 per month
Magpi	Java, Android, BlackBerry, Apple	SMS (at Pro level pricing), forms, Web portal Transmission: SMS, GPRS	Do-it-yourself; tech support at extra cost	Storage in cloud server; extensive dashboard	Includes a few languages (possible to add more if translation is provided); collects GPS data; SMS, Text-to-Speech, and audio messaging	Free version allows 20 forms, up to 100 questions per form, 6,000 uploads per year, Pro version USD$5K per year, Enterprise version USD$10K per year
FrontlineSMS	Most low-tech phones; Forms module requires Java	SMS, forms Transmission: SMS	Do-it-yourself; advanced skip logic	Stored on mobile and local server; basic data aggregation and reporting	Export data into Excel possible; collects images	Free
CrowdMap	Any	Web portal or SMS Can be used with other tools like FrontlineSMS	Intended for monitoring; not structured for surveys	Storage in cloud server; strong visualizations, including interactive mapping	Supports multiple languages; collects and aggregates news, Twitter, e-mail, and information from other electronic sources, which can then be geolocated	Free

Pact. *Mobile Technology Handbook*. Pact, Inc., 2014: 32.

Figure 8: Software and Service Providers

Software or Platforms	Service Model			Support and Maintenance	Technologies Supported			Vendor(s)
	Customized	License	Subscription		Devices	Transmission	Aggregation	
Blaise		X		Email/Paid Support	Computerbased	None	Local	Statistics Netherlands
CommCare	X			Email/Paid Support	Android, Java	GPRS/3G/Hot-sync	Remote/ Local	Dimagi Inc.
EPISurveyor/ Magpi			X	0nline/Email/ Paid Support	Android, Java	GPRS/3G/Hot-	Remote/ Local	Datadyne

						sync		
EPICollect			free	Email	Android, Apple	GPRS/3G	Remote/ Local	EpiCollect @ Imperial College, London
Fieldata.Org	X		X	Online/Email/Paid Support	Android, Java, Generic Mobile Phones	GPRS/3G/SMS	Remote	Arthify Inc.
Freedome Fone	X			Online/Email/Phone	Mobile	IVRS	Local	Freedom Fone
FrontlineSMS	X			Online/Email/Paid Support	Generic Mobile Phones	SMS	Remote/ Local	FrontlineSMS
Kobo ToolBox	X			Online/Email/Paid Support	Andoid	GPRS/3G	Remote	Kobo ToolBox
Nokia Data Gathering			X	Online/Email	Java/Windows Phones	GPRS/3G	Remote	Various
Open Data Kit	X		X	Varies	Android	GPRS/3G	Remote	Various
OpenXdata	X			Varies	Android, Java, Generic Mobile Phones	GPRS/3G	Remote	OpenXdata
Pendragon Forms		X		Online/Email	Android, iPhone, iPad	GPRS/3G/Hot-sync	Remote/ Local	Pendragon Software
PoiMapper			X	Online/Email/Paid Support	Android	GPRS/3G	Remote	Pajat Solutions
RapidSMS	X		X	Varies	Generic Mobile Phones	SMS	Remote/ Local	Arthify Inc. Find Dimagi Inc. Caktus Group
Surveybe		X		Online/Email/Paid Support	Computer-based	None	Local	Surveybe

Mobile-Based Technology for Monitoring & Evaluation. Clear Initiative, 2013. Accessed April 10, 2014: http://www.theclearinitiative.org/mobile-based-tech.pdf.

Appendix C: Big Data Sources

Below is a list of government and organisational sources of big data. This is not a complete list now, and new sources are constantly being posted online for public view. Open Data Index (https://index.okfn.org) provides a list of the countries and the degree to which their data sets have been made public. Readers should see this list as a starting point, and are encouraged to conduct their own-targeted research for programmes and contexts. Statistics Bureaus and Ministries from around the world also publish demographic surveys and other data points in country based websites.

Countries

Australia http://data.gov.au

Austria http://data.gv.at

Belgium http://publicdata.belgium.be/fr

Brazil http://dados.gov.br

Canada http://data.gc.ca/eng

Chile http://datos.gob.cl

Costa Rica http://datosabiertos.gob.go.cr/home/

Denmark http://data.digitaliser.dk

El Salvador http://datos.egob.sv

Finland http://www.suomi.fi/suomifi/tyohuone/yhteiset_palvelut/avoin_data/

France http://www.data.gouv.fr

Germany https://www.govdata.de

Greece http://data.gov.gr

India http://data.gov.in

Ireland http://www.statcentral.ie

Italy http://www.dati.gov.it

Kenya https://opendata.go.ke

Korea https://www.data.go.kr

Mexico http://opendata.mx

Nepal http://data.opennepal.net

The Netherlands https://data.overheid.nl

New Zealand https://data.govt.nz

Norway http://data.norge.no

Russia http://data.gov.ru

Serbia http://rs.ckan.net

Singapore http://data.gov.sg

Slovak Republic http://data.gov.sk

Spain http://datos.gob.es

Sri Lanka http://www.gov.lk/web/index.php?option=com_content&view=article&id=301&Itemid=423&lang=en

Sweden http://oppnadata.se

United Arab Emirates http://www.government.ae/en/web/guest/uae-data

United Kingdom http://data.gov.uk/data/search

United States of America https://www.data.gov

Uruguay http://www.datauy.org

Organisations:

A variety of organisations have also compiled big data information for some of the world's countries. The list of organisations below is not a complete list and there are also other NGO consortiums that have created country data sets. Readers are encouraged to conduct their own country-specific research to find all available resources.

African Union http://au.africadata.org

European Union http://open-data.europa.eu/en/data/

United Nations http://data.un.org

United Nations Development Programme https://data.undp.org

World Bank http://data.worldbank.org