

# Peace IT!

Using ICTs to prevent, manage and resolve crises / September 2009



## The high costs of mobile communications

Mobile phones have been heralded as the second coming in communications for the bottom of the pyramid, the four billion people who live on less than \$2 per day, typically in developing countries. Certainly, mobile communications, with more than 4.5 billion active mobile subscriptions globally at the beginning of 2009, has changed the way we organize ourselves as a global society.

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## Introduction

2009 has been a year of great change and financial upheaval. New technologies have helped us bear witness to on-going conflicts and violence in Sri Lanka, Afghanistan, Iraq, Sudan, Somalia and in particular, Iran. We have seen flash-floods recently hit central America and Pakistan. The H1N1 virus is a global pandemic. The UN, governments and NGOs are using information and communications technologies to map outbreaks, share research and development of vaccines, and help monitor the spread of the virus.

In this edition of Peace IT!, Katrin Verclas, MobileActive.org, looks at the use of mobile phones in developing countries and challenges service providers to have an ethical look at their profit margins; Barbara Weekes looks at the Crisis Management Initiative (CMI), Governance out of a Box (GooB) project designed to provide tools which can support crucial state-building functions in post-conflict countries and situations; Bartel Van de Walle provides an interesting report from ISCRAM 2009; Dr. Choi Soon-Hong, Assistant Secretary-General and Chief Information Technology Officer, United Nations, delivers an excellent keynote at the Deutsche Welle Global Media Forum 7 June 2009; and Daniel Stauffacher and Sanjana Hattotuwa have written a very interesting article looking at disaster management in the Asia-Pacific region.

Enjoy!



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# The high costs of mobile communications

*Katrin Verclas, Co-founder and Editor of MobileActive.org*

Mobile phones have been heralded as the second coming in communications for the bottom of the pyramid, the four billion people who live on less than \$2 per day, typically in developing countries. Certainly, mobile communications, with more than 4.5 billion active mobile subscriptions globally at the beginning of 2009, has changed the way we organize ourselves as a global society.

Mobile phones have changed the way farmers bring their goods to market, how healthcare and medicine is conducted in even the most rural villages, and how we organize ourselves politically. However, mobile communications in many parts of the world is an expensive proposition, especially for the poorest individuals.

There are a number of critical issues that this community of enthusiasts for mobile technology for social good, need to begin discussing:

1. The discrepancy of costs for mobile communications, particularly SMS, by country, that is not explained necessarily by the exigencies of each local market.

Compare, for example, the price of one SMS in the Philippines where roughly a billion SMSes are sent per day, with that of South Africa where roughly 25,000 text messages circulate every day. The cost of an SMS in the Philippines is less than 1 US cent as compared to 7.5 US cents in South Africa.

Why is this so when the marginal cost of sending an SMS for an operator is essentially zero? Could it be that South African operators, in this case, are ripping off poor people?

In fact, in South Africa, according to Steve Song, fellow at the Shuttleworth Foundation, **Sameer Dave**, Chief Technology Officer for MTN, recently acknowledged that MTN is subsidizing their 3G data traffic with revenue from their voice and SMS business. Steve notes that "this means, when it comes to communication, that the poor in South Africa are effectively subsidizing the wealthy."

Steve, on his blog, says:

However, this transformative technology, whose marginal cost of deployment is effectively zero, is being throttled by mobile operators charging a disproportionately high price for the service. Mobile operators in Africa still embrace the economics of scarcity.

**Dominic Cull**, a communications lawyer in South Africa, said at a conference recently that one the "single-most important things mobile operators could do to make a difference for poor people is to drop the price of SMS charges."

In a blog post a year ago that raised quite some ruckus in the United States, the author calculated the following to showcase the insanely high cost of SMS in the country:

A standard SMS message contains up to 140 bytes (1120 bits) of data - this takes care of the 160 characters allowed in your text message. So our total message length is about a tenth of a kilobyte (0.13671875 Kbytes.)

If you divide 140 (the total number of bytes available to you) by 20 (the cost per message), you find that you are paying 1 cent for every 7 bytes of data. This leaves you with a cost of \$1,497.97 for the 1024Kbytes contained in a single megabyte. iPod users: It would cost you \$5,991.88 to transfer - not even to buy - a single song via SMS.

By comparison, I pay \$50 a month for a soft bandwidth limit of 500 gigabytes through a local ISP. That comes out to 512,000 megabytes or 10,240 megabytes to the dollar. This allows me to transfer 2,560 songs for: \$1.

So far I can make the following statements concerning the costs of bandwidth:

**Cost to transfer 2560 songs**

**From my ISP: \$1**

**Via SMS messaging: \$15,339,212.80**

It seems that by some calculations, some 80-90% of an SMS is pure profit - even if one takes into considerations the higher costs of network expansion in many developing countries that operators typically claim is the reason for the high charges.

This explanation makes little sense when comparing African costs for SMS with that of other emerging economies, such as India, for example, a country that is seeing enormous mobile growth to the point of being so explosive it is surpassing Africa as the fastest growing mobile market.

In India, the cost of an SMS is 0.02 USD. In Uganda, by way of comparison, it is 0.07 USD. In purchasing power parity, a measure that compares two currencies to equalize their purchasing power, the difference is even more stark: in India the price of one SMS in PPP is \$0.07, in Uganda \$0.16. Why is this so? Unequal CAPEX and OPEX for the operators in each country do not explain this stark differential.

Given that SMS is the most ubiquitous form of mobile communications, this whopping profit, falls disproportionately on the backs of poor people specifically in Africa, holds back increases in income that mobiles might constitute and may even increase poverty. More on that below.

As Steve Song notes, innovative services are also a victim of price gouging:

Imagine the innovation in services that might be unleashed if SMSes were priced so that Africans didn't have to think twice about sending them. Imagine the economics of abundance being applied to the telecoms sector in Africa. Sadly, voices calling for this on the continent are not nearly loud enough.

2. The second point, not surprisingly then, is that as a result of the high cost of SMS in particular, mobile communications constitute a much higher percentage of a poor person's income than that of a middle class individual. Academics describe this as price inelasticity. In other words, mobile expenditures are inelastic, meaning that higher-income individuals spend a smaller proportion of their income.

In a recent paper, "Towards Evidence-Based Policy: ICT Access and Usage in Africa", published by Research ICT Africa, an outstanding research organization, it is noted that:

This demand-side survey provides insight into the continued marginalisation of large numbers of Africans, even from basic communications services, and confirms the sub-optimal use of communications services due to the high cost of access to services. The value attached to accessing and utilising communications is evident in the considerable portion of household income spent on communications and the multiple strategies used by individuals to maintain communication access according to their cash flow and the prices of alternatives. The willingness-to-pay model arising from the survey suggests that relatively small reductions in the cost of equipment and services would result in increased uptake and usage, with a significant growth in revenue for operators.

Research ICT Africa conducts extensive household surveys that gather relevant data. Astonishing numbers appear in their research:

Kenyans are spending on average nearly 17% of their individual income on mobile communication, followed closely by Tanzania (15.4%) and Senegal (14.2%). This is a reflection of the dynamism of these markets in particular, but the high percentage of individual income spent on mobile is also a reflection of the continued high cost of services on the continent. [These figures compare with average expenditure on communications in OECD of less than 2.5% of household income].

17% of a household's income that is low to begin with is an astonishingly high number and becomes especially stark when taking a look at typically marginalized segments of the population - such as women.

Kathleen Diga, a researcher on the use of mobile devices by women, notes on her blog and in her research:

However, despite the growth [in mobile communications], let us not assume women are part of this accessibility.

First off, we would certainly consider cost as a major deterrent. Did you know that developed countries devote an average 2-3% of their budgets to communication while Africa averages around 10%?

With these high costs, you see women making sacrifices or substitutions within their meager household budgets to accommodate for communication costs. In some cases, a reduction of food can merely mean eating more food from the garden or farm. However, in other cases, women can even find themselves not eating for the day in order to have air-time credit.

In the development sphere, which looks at technology and social practices, how do we seek solutions in overcoming these challenges for women who are looking to "this communication device for a change today in their lives?"



It is high time that we - this community of people interested in seeing the benefits of mobiles especially for poor people realized - start having a serious and concerted effort with mobile operators, policy-makers and advocates around the world. If we indeed believe that mobile communication can deliver essential health and social services, make markets more efficient and increase incomes, then we need to get serious about the issue of mobile pricing and the inequities that are currently visible in countries around the world. Let the conversation begin.

## About MobileActive.org

MobileActive.org is a community of people and organizations using mobile phones for social impact. We are committed to increasing the effectiveness of NGOs around the world who recognize that the 4.5 billion mobile phones provide unprecedented opportunities for organizing, communications, and service and information delivery.

We work together to create the resources NGOs need to effectively use mobile phones in their work: locally relevant content and services, support and learning opportunities, and networks that help MobileActives connect to each other. With these things on hand, tens of thousands of NGOs will be in a better position to enrich and serve their communities.

The MobileActive.org community includes grassroots activists, NGO staff, intermediary organizations, content and service providers, and organizations who fund mobile technology projects.

MobileActive is committed to expanding the knowledge and experiences about the use of mobile phones and to accelerating





## Governance out of a Box State-building in post-conflict situations

### An Innovative Project from Crisis Management Initiative (CMI), Finland

*Barbara Weekes, Member, Advisory Board, ICT4Peace Foundation and Director, Strategy and Content, Geneva Security Forum, Switzerland*

**Interview with Gama B. Roberts, CMI Country Coordinator, Monrovia, Liberia**

I recently had the opportunity to speak with Gama Roberts about the innovative initiative of the Crisis Management Initiative (CMI), **Governance out of a Box (Goob)**, a cutting-edge, yet down-to-earth project designed to provide tools which can support crucial state-building functions in post-conflict countries and situations. A pilot project, which is currently in the planning stages of being implemented in Liberia.

Mr. Roberts is actively involved as CMI's Country Coordinator in Liberia where the Governance out of a Box project was officially launched in November 2008 by Martti Ahtisaari, Former President of the Republic of Finland and Chairman of the Board, CMI and Liberia's President, Ellen Johnson Sirleaf, Africa's first elected female Head of State.

#### Why Liberia?

Liberia suffered through a long period of instability from 1980 to 2003 compounded by civil wars during which it is estimated that at least 250 000 people were killed. The country, inundated with weapons, was left in ruins with mental and physical scars of war visible across the country. The UN has approximately

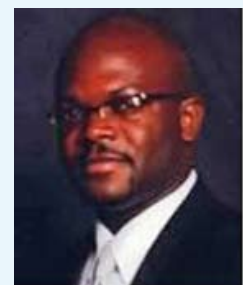
15 000 peacekeepers in Liberia, one of its largest and most costly operations, but the numbers are expected to drop in 2010 as stability deepens further.

Nevertheless, Liberia has made considerable progress since the election in 2006 of President Johnson Sirleaf. Also known as the "Iron Lady", President Johnson Sirleaf has committed herself to reconciliation, the return of Liberia to peace, stability and economic growth and the integration of former child soldiers into society. The long history of instability, corruption and war combined with the possibility to work together with a progressive government demonstrated that the time was ripe to assist, where possible and desired by the Liberian government, in identifying some of the tools which could be utilized to re-build structures and procedures, civil administration, and critical government functions, which respond to the needs of its citizens.



#### Gama Roberts

Before joining CMI as Country Coordinator for Liberia, Gama Roberts began working in 2006 as a consultant in the Liberian Reconstruction and Development Committee (LRDC) in the Office of the President. He served as a lead for the coordination with government ministries and donors on planned projects and programs as detailed in the country's iPRS. He also led the development and application of a Balanced Scorecard model for tracking progress towards achieving development objectives, which served as a foundation for the Monitoring and Reporting framework for the PRS. Mr. Roberts has an Industrial Engineering and Business Management background and has worked in the US technology sector.



## What have been your first steps as country coordinator?

We are preparing the groundwork for multi-stakeholder partnerships, bringing together the key actors from the private sector, NGOs and government to put together a toolkit of solutions that are appropriate and useful for the Liberian post-war environment. The main goals are to support the re-establishment of public administrative functionalities and to look in particular at technological solutions for capacity building for long-term sustainability.

## Which sectors will have top priority at the outset?

President Johnson Sirleaf acknowledged the project in November 2008, during an official visit from former President Ahtisaari, and indicated the possibility of partnering with the Liberian Health Ministry. The proposed idea is to support the implementation of solutions and procedures which can aid the Ministry of Health achieve its mandate of properly documenting birth registrations, and moreover, to do so more efficiently.

## As technology is a key element of all civil administrative procedures, how do you foresee implementation in a country lacking in some of the basic infrastructure necessary to support such a project?

Technological solutions form the foundation of the GooB "toolkits". Technology, in most cases, allows a society to take great leaps forward in development. One thing that is quite amazing about Liberia is that in a country of about 3.4 million people, there are four GSM and one CDMA provider(s). That speaks volumes for the potential use of technology here. The largest provider, which has coverage over most of the country, offers GPRS on mobile phones. The state-owned power company has also piloted, in communities, the use of pay-as-you-go meters which allow the customer to pay for service as needed using mobile top-up credits. There are globally respected banks operating in the country now and a number of them offer Visa / ATM services over data networks. As we work with our partners and stakeholders to refine our technological solution to support the Ministry of Health, we are certainly looking to leverage this infrastructure.

Technology is just one piece of the puzzle however. Capacity to use technology is an imperative which cannot be divorced from any solution we aim to provide with our partners. Training for long term sustainability must be interwoven into our

projects. In the case of Liberia, organizations like the Liberian Institute for Public Administration (LIPA), the Liberia Institute for Statistics and Geo-Information Services (LISGIS), as well as the university system, can be leveraged to build capacity and ensure sustainability.



## What is the timeframe for the Government out of a Box project in Liberia?

The Government's Poverty Reduction Strategy (PRS) covers the period 2009 to 2011. It is a critical deliverable of the Ministry of Health under the PRS to ensure that at least 90% of all children under the age of 5 in Liberia have been registered within this time-frame. Our pilot project will initially focus on one of Liberia's fifteen counties, with a goal of then expanding to cover the remaining fourteen counties over the next three years.

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### Crisis Management Initiative (CMI)

Crisis Management Initiative (CMI) is an independent, non-profit organization that innovatively promotes and works for sustainable security. CMI works to strengthen the capacity of the international community in comprehensive crisis management and conflict resolution. CMI's work builds on wide stakeholder networks. It combines analysis, action and advocacy. [www.cmi.fi](http://www.cmi.fi)

## Governance out of a Box (GooB), CMI

The Governance out of a Box (GooB) project aims to find new approaches and tools to tackle the challenges in state-building. What is envisaged in the project is a set of tools or a "toolkit" that would help quickly to build up the administrative functions in countries in crisis, thus enabling them to offer necessary public services for their citizens. These tools should be at the disposal of the international actors whenever they are operating in post-conflict situations and countries. They should accelerate and improve the support and assistance to the nascent state administrations. They should be standard, but as scalable and flexible as possible, to adjust to differing circumstances.

# ISCRAM2009

## ISCRAM2009

### A report from the 6<sup>th</sup> International conference on Information Systems for Crisis Response and Management

*Bartel Van de Walle, ISCRAM Chair*

The 6<sup>th</sup> International ISCRAM conference held from May 10-13 in Gothenburg, Sweden was in many respects a memorable meeting: an exciting full three day conference program, an excellent international attendance with a noted Chinese delegation, three impressive keynote speakers from government, academia and the field, and last but not least the inauguration of the ISCRAM Association. As usual, the workshops and PhD Colloquium on Sunday provided for a dynamic kick-off of the ISCRAM conference.

In interactive sessions, the participants of the various Sunday workshops discussed international collaboration and the role of SAHANA in the EU funded IRMA (Integrated Risk Management for Africa) project, mobile emergency response and the use of new social media. At the SAHANA-IRMA workshop, the participants discussed the possible deployment and use of SAHANA in Mozambique, a country that is experiencing recurring floods with devastating consequences for the local population. The flooding disaster in Mozambique was explained by Lourino Chemane from the Mozambican Government ICT Policy Implementation Technical Unit, while Chamindra de

Silva illustrated the potential role of SAHANA. The result of the discussions and interactions among the participants was a detailed list of action items, to be taken up by the EU project and the SAHANA community.

Similarly, the workshops on mobile response and new social media were very productive - the latter one also providing for a nice initiation in the use of ISCRAM Live, the new interactive ISCRAM 2.0 website that was set up for the conference. The PhD Colloquium - lead by David Mendonca, Julie Dugdale and Simon French - focused on the career needs and perspectives for about 15 PhD students. Pointing out the “do’s and don’ts” and providing guidance for the many challenges that PhD students experience, all in a friendly atmosphere, provided for valuable advice and a great day, topped off with poster presentations by the PhD students.

As has become a well established ISCRAM tradition, the “Belgian Beer “ get-together took place on Sunday evening, this time in one of the conference hotels. Over 100 participants gathered to meet new or old friends, while enjoying a light snack and a beer - the ideal setting to prepare for the intense 3 day program.



Each day of the conference was kicked off by a keynote speaker, respectively from government, academia and 'the field'. On Monday, Lars Hedstrom from the Swedish office of the Prime Minister explained the many challenges his Office faces in this era of global impact of disasters. The Tuesday keynote was given by Professor Martha Grabowski, who gave her view on the challenges ahead for the ISCRAM community and the emergency management domain. Last but not least, Katrin Verclas from Mobileactive.org presented on Wednesday her keynote talk on the role and future of mobile devices in managing crises.

While it would be unwieldy to discuss every single session and every presentation, it goes without saying that all sessions provided for numerous opportunities to discuss the state of the art in our field, from humanitarian actions and operations to human-computer interaction; from sensor networks to command-and-control systems. The special Demo Session on Tuesday over lunch attracted a large audience, exploring and discussing the different technologies that were showcased. The visit of a large Chinese delegation - 15 Chinese academics and policy makers from Beijing - provided for an exciting special session on the future of the ISCRAM-CHINA conference, with the main organizer Song Yan chairing.

Tuesday May 12th will definitely be remembered as the occasion of the first formal General Assembly of the newly established ISCRAM Association. About 100 ISCRAM Association members gathered in the plenary room to learn more about the ISCRAM Association and elect the first ISCRAM Association Board. The votes of the election were announced by Benny Carlé at the conference dinner later that evening, in the beautiful setting of one of the many islands off the coast of Gothenburg. The elected board members are Bartel Van de Walle, Susanne Jul, Paul Burghardt, Frank Fiedrich, Jonas Landgren, Murray Turoff, Simon French and Song Yan. Together, they face the challenge to further grow the ISCRAM Association and provide increasing value for the over 200 members.

The conference closed on Wednesday May 13th with the traditional Awards ceremony and an announcement of the ISCRAM2010 Conference. The Mike Meleshkin award for best PhD student paper went to Nitesh Bharosa (TUDelft, The Netherlands). In his paper, co-authored by Marijn Janssen, Nitesh adopts a theory-driven approach to develop a set of information management roles and dynamic capabilities for disaster management. Building on the principles of advance structuring and dynamic adjustment, Nitesh and his co-author develop a set of roles and capabilities, which are then illustrated and extended using two field studies in the Netherlands. The paper is important because it addresses a critical issue: what are essential characteristics of information systems in our domain? The paper provides a thorough assessment for why information systems need to facilitate adaptivity and a good balance between theory and empirical evidence from field studies. The paper also includes a critical reflection and takes a multidisciplinary perspective and we believe it has the potential to advance this field.

The ISCRAM2009 best paper award was given to Zeno E. Franco, Nina Zumel, John Holman, Kathy Blau, and Larry E. Beutler (from the Pacific Graduate School of Psychology and Quimba Software). Their multidisciplinary paper evaluates the utility of the Incident Command System (ICS) in varying disaster contexts. As many of you know ICS is mandated in the United States to be used during incident and disaster response. The

authors address important theoretical issues - namely information processing and improvisation - with a clear impact on information systems for crisis management in a real-world context. The paper gives a sound and convincing rationale in de-

veloping its ideas. Improvisation is operationalized for simulation by grounding in previous research. The paper is well structured and written, with a clear and concise presentation of the research questions, the used methods and the analysis. It reflects on the results, and explicitly identifies its limitations and the further research needed.

Finally, the ISCRAM Community Distinguished Service Award was this year awarded to no less than 5 people: Susanne Jul and Jonas Landgren for their work and effort for ISCRAM2009, Roxanne Hiltz for her continued active support for ISCRAM since ISCRAM2006 in New Jersey, Song Yan for her dedication and work for organizing the ISCRAM-CHINA conferences in Harbin, and Veerle Van Der Sluys for taking such good care of the ISCRAM website over the past years, and most notably ISCRAM Live as the new web 2.0 ISCRAM website.

The ISCRAMLive website (at <http://www.iscram.org/live>) offers a fairly complete and detailed view on (almost) everything that happened during ISCRAM2009: videos of most sessions, papers, presentations, tweets, bookmarks, and hundreds of pictures. So in case you have missed this year's conference, you may still relive some of the exciting stories that were told through ISCRAM Live.



ISCRAM2010 will be held in Seattle, Washington, next May, with Mark Haselkorn as conference chair and Simon French as program chair. The preliminary Call for Papers is out already, and the submission deadlines have been moved closer in time considerably. I do hope you find the time to submit your work, and I am most definitely looking forward to seeing you in Seattle!

## Keynote by Dr. Choi Soon-Hong

### Assistant Secretary-General and Chief Information Technology Officer, United Nations, Deutsche Welle Global Media Forum 7 June 2009

As in society at large, new information technologies and new media solutions have woven themselves into the fabric of what we do from all sides - whether it is social engagement, economic development, humanitarian assistance, or even UN's peacekeeping mission. As the first ever Chief Information Technology Officer for the United Nations, I am happy to report that the UN has made good progress in not just recognizing but institutionalizing the power of information technology. Never before, information technology has been as visible and well-positioned as a driver for change within this global institution. The challenge for the UN and its stakeholders is now to find a way to harness the power of both traditional and new solutions to better serve, to better inform, and to better protect people, especially in times of crises.

Often times, this means providing the right information at the right time, whether it is during a natural disaster such as the Tsunami in Thailand, the current urgent need to help internally displaced people in Sri Lanka, or the evacuation of people in certain parts of the Democratic Republic of Congo (DRC) due

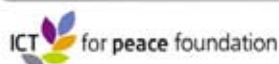
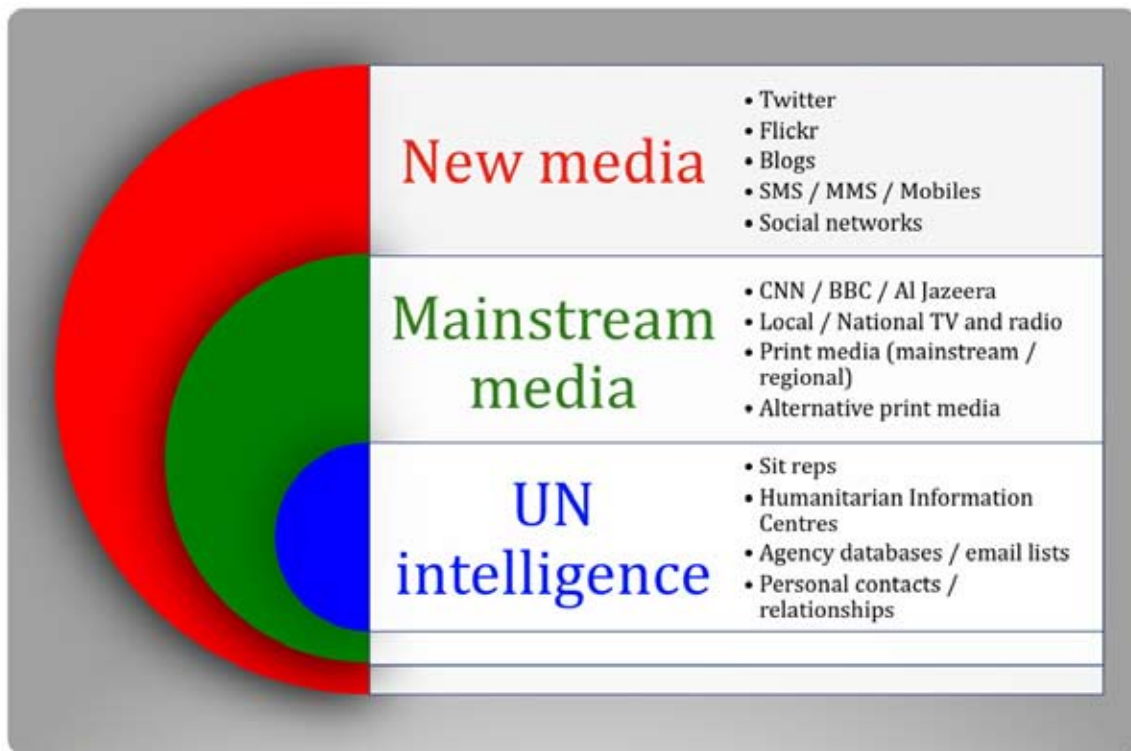
to a potential of catastrophic volcanic eruption. In any such scenario, having access to timely and reliable information will save lives and allow governments, UN organizations, NGOs, the media, and others to achieve better results.

The reality, however, is that many organizations involved in crises often develop what we call "point solutions", instead of "integrated solutions", to manage crisis information. This is of course a product of a long history of organic growth of these organizations and the necessity among many of the organizations operating across multiple countries and regions to respond to varying situations. However, advances in technology and improvements in our ability to communicate with one another have provided the opportunity to collaborate more effectively and, more importantly, to begin developing more integrated approaches to leverage information to prevent, respond to, and recover from crises.

In fact, my office, in collaboration with the ICT4Peace Foundation, is currently leading an initiative with our key stakeholders in the field and at headquarters to formulate such inte-







grated approaches that will produce significant improvements in the overall crisis information management capabilities of the international community. An initial stocktaking exercise of current situations was conducted last year and we have since gathered a group of information management and technology specialists developing the integrated approaches. Toward this end, we will be focusing on four main fronts: (1) information architecture work to define and gather a set of data critically needed during a crisis, (2) technology development initiatives to create interoperable systems and tools, (3) capacity building activities to enhance the international community's overall human resources and technical capacity to deal with crises, and finally (4) outreach efforts to increase support from a broad spectrum of stakeholders in both public and private sectors for the new approach.

While these "technicalities" may not seem as directly relevant to this audience, the success of such an endeavor will have incredibly far-reaching implications for the UN and other actors in the field. For example, streamlining and standardizing the way we collect and share critical information prior to and during a crisis could lead to more effective decision-making and timely delivery of essential services to those in need of help. The availability of more credible, accurate, complete and timely information could also contribute to improving public communications and journalistic reporting. With improved quality of information, fund-raising efforts that depend upon broad public awareness and support could produce better results. Finally, with more complete and accessible data, post conflict event reporting and evaluation could be facts-based and transparent.

Furthermore, incorporating integrated strategies means that citizens, the media, and organizations can both use and

"feed-in" important real-time data during crises as well. In fact, we have been working with a non-profit organization some of you may know, Ushahidi, to enhance real-time situation reporting based on crowd-sourcing. You may recall that Ushahidi arose in response to the 2008 post-election crisis in Kenya. Establishing an environment, where innovation such as that of Ushahidi can be leveraged more broadly and easily, is part of the goals of our integrated approaches. Indeed, if you go to the Ushahidi website today, you will find that they have also deployed the tool in response to the 2009 elections in India and the recent H1N1 virus epidemic.

Examples like this one are increasingly frequent as more and more people gain access to the Internet and mobile technologies in remote areas of the world. At the same time, it is also important to note that traditional communications channels, such as sirens and radio, are still very much part of how information is communicated during a crisis in some parts of the world. I want to assure you that our integrated approaches to crisis information management that I have described will attempt to support a range of solutions both high and low-tech, as well as for challenging environment where high network bandwidth is not available.

Finally, I am conscious of the role that the UN can play in uniting disparate actors and solutions across various sectors of society. As such, I am genuinely interested in learning more about new multimedia tools and practices you may be more familiar with. I also welcome your ideas and inputs on our efforts as well.

Indeed, the world of multimedia technology is in transition. It is increasingly obvious that the transition will have major influence on the future of the media's information creation, delivery and management.

# ICT for disaster management in least developed countries and small islands in the Asia Pacific Region

Daniel Stauffacher and Sanjana Hattotuwa  
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## Introduction

The Asia-Pacific is among the most disaster prone regions in the world. The most frequent natural hazards in the region include geological hazards (earthquakes, tsunamis, landslides and volcanoes), hydro-meteorological hazards (floods, cyclones and droughts) and other hazards such as epidemics and insect infestations. During the past 10 years, the region suffered exceptional losses from a number of major calamities. To name a few, the 1995 Kobe earthquake killed more than 6,400 people plus 85 billion US\$ worth of destruction. In 1997, floods alone caused US\$ 7.23 billion worth of damages in seven countries. In 1998, the most extreme floods in several decades devastated several countries in the region, particularly Bangladesh, China and Vietnam, while the El Niño Southern Oscillation droughts caused water shortages and forest fires in Indonesia and the Philippines. In 1998, the tsunami triggered by earthquakes hit Papua New Guinea and killed more than 2,000 people in several coastal villages. In 2003, the Bam earthquake in Iran killed at least 40,000 people and destroyed 85 percent of the buildings and infrastructures in that area. In December 2004, the tsunami that occurred in the Indian Ocean killed more than 300,000 people.<sup>1</sup>

Disaster management is an imperfect science. It is impossible to accurately predict when and where a disaster will occur. However efforts towards drawing up national and regional

disaster risk management strategies have also encountered significant challenges. Studies show that the problem lies not with the use and adoption of technology per se, but with the more entrenched culture of institutional and individual resistance to information sharing in an open, timely and sustainable manner. Governments, as well as local and transnational non-governmental institutions, are both victims to and perpetrators of this culture of secrecy. In controlling the flow of information - what gets out where, to whom, how and when - these stakeholders directly influence disaster management planning and action. Key stakeholders including non-governmental agencies are culpable for significant lapses in information flows. Lessons identified have not been learnt. These gaps have cost lives. This brief paper is an attempt to map how ICTs can and have helped in disaster management even in least developed countries in the Asia Pacific region and suggests that though key stakeholders may (today) be averse to the accountability and transparency that ICTs bring to disaster management frameworks, their increasing use by citizens are a compelling argument to fully integrate them into all aspects of disaster early warning, management, mitigation and response.

## Disaster Management in Least Developed Countries

Disaster risk management is a significant challenge for devel-



Source: Habitat for Humanity, UK



Photo from recent flooding in Menik Camp, August 2009

oped countries and even more so for countries that are at a lower level of socio-economic development. As noted by the UN, LDCs represent the poorest and weakest segment of the international community and are characterized, inter alia, by their acute susceptibility to external economic shocks, natural and manmade disasters and communicable diseases. 2. In the Asia Pacific region, one counts Afghanistan, Bhutan, Bangladesh, Cambodia, East Timor, Myanmar, Nepal and Maldives among the 15 other countries classified by the UN as LDCs. 3. It's evident that most of these countries are prone to large-scale disasters including floods, earthquakes, tsunamis, landslides and mudslides. Of significance here are the low penetration levels of Information and Communications Technologies in these countries. Traditional markers of ICT penetration such as the number of phone lines, TVs, radios or PCs in these countries suggest a very small segment of the population able to avail themselves of information dissemination through these media. At the national level, a low level of economic development, poor infrastructure, illiteracy, governmental control of media and political unrest are, inter alia, inhibitors of public sector ICT progress. 5. Added to these is the challenge of State monopolies on telecoms infrastructure that without any significant competition and the resulting lack of meaningful investment and incentive, offer levels of service and access far below industry standards. According to the UNDP Human Development Report of 2005, in 2003, the tele-densities of Cambodia, Nepal and Bangladesh were 38, 18 and 15 per 1,000 people, respectively. The situation is the same for radio and television. The irony is that while a small selection of households might have all of these media, the majority does not have any of them. With such low penetration levels, it is extremely difficult to establish any effective ICT-based disaster warning system 6. Yet it is also the case that ownership and more significantly the use of mobile phones in these countries show an exponential growth per year. As noted in Teleuse, the Asia-Pacific region is one of the world's fastest growing telecom markets. 7. It is widely accepted that the 'next billion subscribers' will come from emerging markets, particularly India, China and other emerging Asian countries. The biggest and most widespread impact of access to telephones is in creating a sense of security,

due to the ability to act in an emergency. Benefits can also be seen in disaster management, through all stages from warning to response to recovery.

The use of ICTs in Disaster Management "conventional wisdom" suggests that Least Developed Countries (LDCs) have little or no role for Information and Communication Technologies (ICTs) in disaster risk management. It is vital to challenge this preconception. A recent APDIP (UNDP Asia Pacific Development Information Programme) primer on ICT and Disaster Management suggests six symbiotic phases of the disaster risk management cycle. 9 During each stage ICT has a critical role to play.

- **Mitigation:** any activity that reduces either the chance of a hazard taking place or a hazard turning into disaster.
- **Risk reduction:** anticipatory measures and actions that seek to avoid future risks as a result of a disaster.
- **Prevention:** avoiding a disaster even at the eleventh hour.
- **Preparedness:** plans or preparations made to save lives or property, and help the response and rescue service operations. This phase covers implementation/operation, early warning systems and capacity building so the population will react appropriately when an early warning is issued.
- **Response:** includes actions taken to save lives and prevent property damage, and to preserve the environment during emergencies or disasters. The response phase is the implementation of action plans.
- **Recovery:** includes actions that assist a community to return to a sense of normalcy after a disaster.

**Some of the immediate uses and benefits in providing ICT include:** giving remote communities access to constantly updated weather and geological information; creating early warning systems using local knowledge; using tele-centres to serve as repositories of information on emergency procedures and evacuation guidelines; coordinating the work of aid agencies on the ground ensuring the delivery of aid and relief to all communities; monitoring aid flows and evaluating delivery; creating effective mechanisms for the coordination of reconstruction and relief efforts; creating avenues for effective communication between field operations and warehouses based in urban centres; creating secure virtual collaboration workspaces that bring in individuals and organisations without ethnic, geographic or religious boundaries, and enabling centralised data collection centres that collect information from the field and distribute it to relevant stakeholders.

In the longer term, it is imperative to use trust relationships nurtured in virtual domains, for example, in state and non-state actors coming together in virtual spaces for aid and relief coordination. Technology can help knowledge flows from the diaspora to directly influence developmental processes on the ground, by-passing, if necessary, third parties to directly empower communities. Tele-centres can be repositories of alternative livelihoods in areas where it is now impossible to carry on traditional modes of living. Using cheaply available self-powered digital radios with broadband downlinks, it is possible to empower even the remotest communities with information that they can translate into knowledge to help them rebuild lives and create connections with others who have suffered the same plight. Online dispute resolution can use organ-



ic and local knowledge frameworks with creative and modern dispute resolution mechanisms to effectively address the problems that individuals and communities will face on the ground with limited access to resources. Radio and television, mobile and fixed line telephones, technologies such as SMS and cell broadcasting, addressable satellite radios, Internet and the web as well as community radio have been identified as complementary mechanisms that can aid in disaster management in any country. 11

Software such as Microsoft Groove Virtual Office® have also been used in disaster management and point to the growing potential of collaboration tools able to direct urgent needs in the field to logistics hubs that are then able to route supplies accordingly.<sup>12</sup> Further, applied research and best practices in the region strongly suggests a range of technologies and media can be effectively used to create disaster management frameworks that are scalable, sustainable and resilient. For example, at a presentation held in 2007, researchers at the Sri Lanka based research organization, Lirneasia, flagged technologies such as SMS, remote sensing, satellite radio and Common Alerting Protocols that significantly aided (village level) community disaster planning and response. <sup>13</sup> As noted in the ICT4Peace Foundation's 2005 report, initiatives such as the Center of Excellence in Disaster Management and Humanitarian Assistance (<http://www.coedmh.org>), a project mandated by the US Congress to improve the coordination and integration of the world's response to natural disasters, humanitarian crises and peace operations and FedNet (<https://fednet.ifrc.org>) by the International Federation of Red Cross and Red Crescent Societies, are two examples of significant mechanisms that use ICTs in all aspects of disaster management, mitigation and response.

It is true that the potential of ICTs must never blind us to the practical realities of disaster risk management in countries with volatile socio-political and economic conditions. With political will and strategic foresight, they can be indispensable tools that strengthen disaster management. Fundamental is the need to meaningfully engender institutional and political leadership by public and private policy-makers and local community leaders to further disaster management at all levels of polity and society. The problem is more often one of leader-

ship than of a lack of technology itself. We can no longer say that the potential of ICTs to meaningfully strengthen disaster risk management even in LDCs and developing countries exists only on paper. **Numerous examples, case studies and research programmes have demonstrated that ICT saves lives.** It is incumbent upon policy-makers to look at ways in which their fullest support is lent to efforts to strengthen disaster management frameworks that leverage technologies that are sustainable, easily deployed, adaptable and function with the least disruption to existing early warning and disaster response mechanisms at the community, regional or national levels.

### About the authors

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**ISCRAM2010** will be held in Seattle, Washington from 2-5 May 2010, with Mark Haselkorn as conference chair and Simon French as program chair.

<http://www.iscram.org>

It is websites such as the new **UN archive on the drafting process that led up to the Universal Declaration of Human Rights (UDHR)** that showcase the potential of the web to make information that is otherwise inaccessible instantly available globally. The UDHR 60 years on continues to be a founding block for democracy. The documents archived on this site from the UN's discussions leading up to the final version offer a unique insight into the workings of the UN.

<http://www.un.org/Depts/dhl/udhr/>

The BBC's Nik Gowing writes an excellent piece in the Guardian on how new media is **subverting traditional media's vice grip on news and information**.

<http://www.guardian.co.uk/commentisfree/2009/may/11/real-time-media-government>

In **"We are all writers now"**, Anne Trubek opines:

"Yes, we need to darken the line between what is verifiable and what is hearsay. The financial downturn and its disastrous impact on print publishing has led some to think we can do without trained reporters and editors-professionals who know how to check facts and strip the gloss off hasty pronouncements. We need this work, perhaps now more than ever. But not at the expense of silencing the new voices-an exciting new crop of self-possessed scribes-ringing all over our screens. There may be too much, but that does not mean it is unworthy."

<http://www.moreintelligentlife.com/content/anne-trubek/we-are-all-writers-now>

**The Trouble with War Games**

<http://www.moreintelligentlife.com/comment/reply/1770>

**"Digital demonisation", the UN SG on hate speech:**

"... we have seen it time and again targeting innocents because of their faith, their race, their ethnicity, their sexual orientation. Here at the United Nations, we understand the power of words. Words can hurt or they can heal. They can rupture or they can repair. For young people, electronic harassment and cyber-hate can have a searing impact. We must be aware. We must remain vigilant. Protecting children is a top priority for the United Nations. And we have taken a number of steps to make cyberspace safer for young people."

<http://www0.un.org/News/Press/docs/2009/sgsm12319.doc.html>

<http://www.unmultimedia.org/radio/english/detail/77017.html>

**Augmented reality through mobile: this is absolute cutting edge technology and demonstrates the power of mobiles today:**

<http://layareu/>

An excellent new report from the International Fund for Agricultural Development (IFAD) looks at GIS and participatory mapping techniques that in places like Ghana have been used for conflict resolution as well.

Download the full report from [http://www.ifad.org/pub/map/PM\\_web.pdf](http://www.ifad.org/pub/map/PM_web.pdf)

**More radios than TVs and phones in South and South East Asia**

<http://irneasia.net/2009/05/more-radios-than-tvs-and-phones/>

The Chairman of the ICT4Peace Foundation has a great interview with the International Relations and Security Network on the **use of Information and Communications Technologies (ICTs) in peacebuilding**.

The podcast is available: <http://www.isn.ethz.ch/isn/Current-Affairs/Podcasts/Detail/?lng=en&id=99401>

Rarely does one find an article as sober and compelling as Evgeny Morozov's **Texting Toward Utopia: Does the Internet spread democracy?**, published in the Boston Review.

<http://bostonreview.net/BR34.2/morozov.php>

**Cyclone Nargis: Lessons and implications for ICTs in Humanitarian Aid**

Download the report [http://www.ict4peace.org/view\\_files-1-v-169.html](http://www.ict4peace.org/view_files-1-v-169.html)

Download the update to the report [http://www.ict4peace.org/view\\_files-1-v-170.html](http://www.ict4peace.org/view_files-1-v-170.html)

**Behavioral patterns on Facebook: We are still intimate beings**

<http://www.insidefacebook.com/2009/02/27/facebooks-in-house-sociologist-shares-stats-on-users-social-behavior/>

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**Photos and diagrams**

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**About the ICT4Peace Foundation**

The ICT4Peace Foundation (<http://www.ict4peace.org>) was established in 2006 and is based in Geneva, Switzerland. Serving as a hub for research, advocacy and networking on the topic of ICT used to prevent, respond to and recover from conflict, its genesis and raison d'être lies with Paragraph 36 of the World Summit on the Information Society Tunis commitment:

"We value the potential of ICTs to promote peace and to prevent conflict which, inter alia, negatively affects achieving development goals. ICTs can be used for identifying conflict situations through early warning systems preventing conflicts, promoting their peaceful resolution, supporting humanitarian action, including protection of civilians in armed conflicts, facilitating peacekeeping missions, and assisting post conflict peacebuilding and reconstruction."

For more examples of the use of ICTs in line with the Tunis Commitment, visit the Foundation's ICT4Peace wiki here: <http://inventory.ict4peace.org/>

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