# Harnessing Connection Technologies for Development

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**The development field is exploding with the potential of new technologies, from the wireless revolution to the digitization of just about everything: words, sounds, images and geography itself. The ability to connect individuals to the knowledge and resources they need electronically—without roads, schoolhouses, clinics or corrupt government bureaucracies—seems too good to be true, and sometimes is. Communication technologies, which are really better described as connection technologies, are a part of this larger technological revolution.**

The most basic connection technologies are cell phones, which exist to allow people to communicate to one another, and the Internet, which can be accessed through Internet cafes, home access or smart phones. Once connected to the Internet, additional technologies, in the form of specific software, allow individuals to connect with each other in a variety of prescribed ways (friending, tweeting, sharing, competing, querying, challenging and collaborating). Much of this software falls into the category of "social media," because it enables the kinds of interactions online that we think of as social activity (hanging out with your friends, making new friends, playing games, sharing stories and useful information).

As connection technologies, these media not only grant people easy communication access to one another but also permit greater reciprocity in relationships among development thinkers, service deliverers and beneficiaries. The rise of blogs, Twitter and crowd-sourcing Web sites has the potential to expand the variety of individuals who can present ideas and discuss approaches to development with a wide audience. The eruption of new platforms—such as Global Voices, Ushahidi, Twaweza and Wikipedia—invites beneficiaries to assume roles as data providers and fact-checkers. In doing so, consumers

become producers of content. For instance, Ushahidi allowed individuals affected by the 2010 Haitian earthquake to post information on lost individuals to a centralized Web site. Rescue organizations were then able to use these posts to reunite families. Another organization, Twaweza, enables anyone with a mobile phone to get involved in monitoring the quality of public service and distribution. These examples illustrate that connection technologies are potential resources for empowering citizens, and for already-empowered Netizens, to take charge of their own development and hold their governments accountable.

Scaling up is often the challenge that derails many promising development solutions. With connection technologies, however, scale is a precondition for success. These technologies depend on networks that link individuals to one another and hence benefit from network effects; that is, the more participants there are in a network, the more valuable the network becomes—and hence the more participants it attracts. The ease of access via Internet or mobile phone applications reduces costs to participation—whether in the form of blog posts, petitions, votes, donations, data provision or online videos. For example, Global Voices and Al Jazeera Stream make it easier for individuals who previously had limited access to global audiences to provide input, photos and videos. Additionally, these connection technologies increase the potential benefits of participation. The postings of videos and the publishing of innovative campaigns have been shown to incite global protest and change—and to attract even greater numbers into the mass network of interested and participating individuals.

Other characteristics of mass networks include fluidity, versatility, democracy and reciprocity. They are fluid in the sense that they are constantly changing, both in terms of who is participating and how. They are versatile; different types of mass networks frequently morph into one another. New applications of and for these networks are constantly emerging. They are deeply democratic, in that anyone with mobile or Internet connectivity can participate and build a following. And they are reciprocal in their very essence: They enable and depend on reciprocal exchange.

This paper maps the types of mass networks that have formed around applications of connection technologies. The discussion that follows identifies three different categories of mass networks: reciprocal information communities (RICs), reciprocal information and participation platforms (RIPPs) and crowd-solicitation platforms (CSPs). The distinctions among these categories reflect important differences in the types of participants; the degree of active participation; the types of interaction among participants; the open-ended ability to generate new uses and applications of the information collected; and the directedness of the community. This typology seeks to go beyond common terminology, such as “crowd mapping” and “crowd sourcing,” to create more conceptual categories that can group together multiple phenomena. The final section raises a number of research and policy questions that arise from this initial survey of such mass networks.

Overall, the phenomenon of mass networks in the development community (as elsewhere) is so new and changing so fast that it is extremely difficult to categorize and analyze, much less to link specific categories of networks to particular development outcomes. Another useful approach would be to categorize different networks in terms of the exact developmental functions they perform. That effort is beyond the scope of this paper, but it is our hope that the typology used here will prompt discussion and revision.

## MAPPING THE TERRITORY

### *Reciprocal Information Communities (RICs)*

RICs revolve around a basic group of actively interacting experts. These expert groups become central nodes for disseminating valuable information when they attract a large enough readership. What qualifies these communities as mass networks is that they use connection technologies that can allow for enormous amplification effects from the experts at the center of the community to less active experts or interested persons on the periphery. These amplification effects result from the effective use of tweeting, reposting, liking and linking on different social and information media. At the same time, RICs will not work if the flow of information is only from the center outward. Reciprocal information flows in all directions between theorists, policy analysts, and action-takers are thus critical to the success of the community.

A prime example of an RIC is the African development blogosphere, which frequently makes forays into the Twitter world. It is a mass network made up primarily of development political scientists, economists, think tank experts and workers in public service or nongovernmental organizations (NGOs) who have blog and Twitter connections to the African diaspora, vocal African activists and business communities. Many of the participants in this network also have many followers who are family members, former students and engaged citizens interested in development issues and in ways to take action.

This African development blogosphere RIC is an important forum for spreading knowledge about development research, best practices and failures among a diverse community of development professionals. Many central members of this network are bloggers, contributing to an institutional blog such as the Center for Global Development blog. These African development bloggers typically welcome comments and critical debate, often fostering conversation by linking and responding to posts on other blogs and broadcasting these virtual, asynchronous conversations through Twitter and other social media. In addition to citing and conversing with one another, bloggers in developed countries (often based in think tanks or universities) also summarize recent papers and books of which development practitioners may not be aware or to which they lack subscription or bookstore access. Development practitioners often respond with critiques, examples and counterexamples from their own experience.

Equally important is cross-fertilization among sectors. Development experts who blog also consistently inject new ideas and perspectives into debates by reading (or at least skimming) blogs in related spheres like economics, aid and regional politics (the African politics blogosphere is a subculture of its own). Active blogs are shared with family, friends, specialists within the NGO community and experts at government development ministries, as well as employees of international and regional development banks, development organizations and corporations that are increasingly engaged in developing markets—basically anyone with an interest in the blogger and/or the blog content.

The conversation itself, and particularly the cross-fertilization that fuels it, are themselves important for broadcasting, critiquing and improving development theories and practice. But this description of the blogosphere thus far is not so different from a description of the multiple development conferences that take place every year, bringing scholars and practitioners together to exchange ideas. What makes the development blogosphere a mass network is that the difference in degree—the scale and speed of amplification—amounts to a difference in kind.

To see how this works, consider the Twitter feed of three development experts, two based in the U.S., @TexasinAfrica and @ViewfromtheCave, and one in Africa, @AfricaTechie. @TexasinAfrica is the Twitter handle of Laura Seay, an assistant professor at Morehouse College in Atlanta who has done fieldwork in the Democratic Republic of the Congo and is widely regarded as a reliable Western voice on Africa. Seay has 8,904 followers and follows 263 other people, many of whom are also development experts. She sends out a tweet at least once every 3 or 4 hours, and often between 5 and 10 an hour during the business day in whatever time zone she is in.[1] Almost all the feeds with which she interacts have at least 400 followers, and many have more than 1,000. For instance, on Saturday July 14, 2012, @TexasinAfrica was mentioned on dozens of other feeds by name. As a result, Seay achieved a reach not only of her 8,904 followers but also of everyone following someone who mentioned her—another 43,164 followers—for a total of 52,068 followers potentially reached. (For non–Twitter users, it is important to note that almost all the tweets she sends out include links to longer pieces, such as newspaper and journal articles, think tank reports, blog posts and interviews.) That is a vastly greater dissemination of her own views, writings and assessments of valuable material from others than she could possibly ever have reached as an assistant professor at a relatively small American college even five years ago.

@ViewfromtheCave is the Twitter handle for Tom Murphy. Murphy describes himself as an "aid and development blogger, social media consultant, and self-proclaimed hack" on his blog *A View from the Cave: Learning and Discussing What Are Smart Aid and Development*, which

draws roughly 1,000 regular readers a day and 25,000 page views a month. He has 6,031 Twitter followers and follows 4,001 people or organizations. He tweets roughly at the same frequency as @TexasinAfrica and tweets about or to roughly 25 people a day, most of whom have at least 1,000 followers. Using the same formula as that given above, Murphy reached an audience of 21,824 (6,031 + 15,793) followers on July 14, 2012.

@AfricaTechie is the Twitter handle for the anonymous author of the *Diary of an African Entrepreneur Blog* who tweets about the challenges of doing business in Africa. She has 10,230 followers and follows 1,560 other handles. She tweets between 10 and 30 times a day, and at her most active hours, tweets about 5 or 6 times per hour. She tweets to or is tweeted to or about by 15 people a day. Each of these Twitter handles has an average readership of 1,000 (excluding superstar followers like Jacqueline Novagratz of the Acumen Fund, who has over 400,000 followers, and a few disconnected individuals, who have 20 followers). Using the same rough calculation, @AfricaTechie's reach on July 14, 2012, was 38,306 (10,230 + 27,806) followers.

For those familiar with Twitter, it is obviously unlikely that all of one's Twitter followers will see every post, unless they are online at the same time. These data assume that people who frequently correspond with a feed do a moderately good job of following the information on the feed and do not filter it heavily. Furthermore, July 14 was a Saturday and some of these individuals may be more or less active on a weekday or in response to a particular event that occurred that day. Thus the reach of each feed may vary considerably day by day. This very simple calculation merely shows the enormous amplification effects of social media by identifying the number of people who could easily access and view each Twitter handle's posts.

Think about it: A blogger like Murphy can have a readership of between 20,000 and 50,000 people without even having a formal institutional base (Murphy does write for the *Christian Science Monitor*, the *Huffington Post* and other places, but as a freelance development expert.) Critically, he is as much a filter and a broadcaster/re-broadcaster as he is a writer. Indeed, as he points out, "blogging is generally reactionary," by which he means that his blog introduces readers to new things popping up on the development landscape and then responding to them.[2] Compared with how they are handled at academic conferences or in journals and institutional publications, new events and changes can be analyzed and discussed quickly, editing and critiquing can be conducted organically, and new information can be spread rapidly and much more openly. A summary analysis of a World Bank publication or an evaluation of a mobile health initiative can now more easily reach a wider audience, including those who do not pay for journal subscriptions or those who do not check disparate institutions' Web sites daily. They merely have to check their Google Reader, Twitter or Facebook account.

Thus, the principal value of RICs is amplification and empowerment. Individuals who have no other way to make their views and knowledge known can participate and build a following based on the interest in, and the perceived merit of, the issues they write about or to which they respond. Organizations whose publications might normally have a relatively small group of technical readers can now reach a far larger audience. Theorists can be challenged by practitioners; practitioners can be prodded and inspired by scholars.

Although careful digital tracking would be required to establish the fact, it is also possible that an RIC can function as a virtual test laboratory where different approaches can be presented and then improved or abandoned in the context of a constant dialogue. Equally important, an RIC can help a specific solution (microfinance, a clean cookstove program, crisis-mapping technology) seed itself in countless smaller initiatives all over the development community that together can amount to the equivalent of one very large-scale project.

Finally, RICs perform the essential psychological function of building a community. This social function is a critical component of the "customer service" and marketing of the blogosphere. Through personal anecdotes, advice and even the sharing of online comics, bloggers build social relationships, in addition to the relationships formed through information sharing and debate. The creation of

a reciprocal information *community* means the building of social bonds solidified by shared affinities, interest and, most important, almost daily conversations, debates and shared news. Such social bonds are often the fuel for further intellectual, technical and organizational progress on actual development projects.

The last point to emphasize about RICs is the steady democratization of participation in them. Programmers are designing new platforms for very basic smart phones, like Facebook Zero and Twitter Zero. As these apps gain traction, they open up participation to non-data phone owners and to anyone who has access to an Internet café. A growing pool of readers can discuss, critique and show support for others' posts at high speed. Indonesia, for instance, is one of the countries with the highest share of Twitter users in the world, even though it is well behind many developed countries in other measures of technology use.

Further research will be necessary to determine if and to what extent this type of connectivity via RICs leads to faster evolution of norms, values and mobilization, as many journalists and bloggers have argued. But the potential is enormous. Individuals who were formerly easily ignored, overlooked or spoken for now have the opportunity to speak out, complain or congratulate. If and as communities adopt these technologies for political participation purposes, development organizations, government officials and community leaders will need to recalibrate their strategies concerning accountability. Obviously, social media skill and social status will still play a role in influencing members of mobile phone and online mass networks, but the vast number and increasing speed of individuals exchanging information and opinions makes the control and manipulation of information harder and harder to achieve. The very idea of a top-down development paradigm will give way to a much more horizontal, community-based model.

### *Reciprocal Information and Participation Platforms (RIPPs)*

RIPPs are the second category of mass networks. These platforms work by collecting information about a particular phenomenon from a large number of widely distributed contributors. This information is then combined with geospatial and other technologies. The example that most people know best is the Ushahidi crisis-mapping technology, which was first developed to allow voters all over Kenya to text information about election-related violence into a central site where the data could then be mapped and used to mobilize a response.

Whereas RICs grow linearly in terms of impact and effectiveness, (even small RICs are valuable for their participants through their amplification and psychological effects), RIPP growth is nonlinear. RIPPs require a critical mass of participants to be effective in the first place. Knowing whether there was fraud at a few poll sites or that sexual harassment took place in a few places in a given area is not of sufficient interest or value; such a platform needs to have attracted a sufficiently large enough population to be useful. RIPPs thus rely on a crowd more than a community. Many if not all RIPPS would qualify as crowd-mapping or crowd-sourcing initiatives, but "crowd sourcing" is an overly inclusive category for our purposes. Here we focus on crowd participation that is both reciprocal and versatile—that is, on the creation of platforms that serve multiple functions depending on the creativity and needs of their users.

RIPPs are reciprocal because the same people who provide, aggregate or analyze the information—such as victims of violence, harassment, corruption and natural disasters—benefit from the provision of information by others. Unlike those who are part of RICs, users of RIPPs participate in a specific way, such as posting the locations of a particular act of violence or crime. The platform also explicitly serves a purpose outside (although sometimes in addition to) discussion and social bonding. For example, Esoko, an RIPP that focuses "on agricultural value chains with the explicit goal of improving the transparency of markets and the operational efficiency of organizations," asks farmers to text information about crops so that data can be collected.[3] Farmers participate because they receive valuable analysis from the aggregated data to make critical decisions about harvests, prices and trade locations.

Platforms also provide a foundation for a constantly shifting array of innovations. Entrepreneurial users can adapt the platform of other uses, as in the case

of Ushahidi's open-source software; make a copy-cat platform; or use the information from the platform for additional purposes. HealthMap is one such online platform that has been used for a variety of public health, demographic research and tourism uses. The following are other examples of RIPPs and their purposes.

*Ushahidi Open Source Software and Its Applications.* Ushahidi came about in response to Kenyan bloggers' calls to repurpose Google Maps to identify the extent of the violence in Kenya following the 2007 presidential election. It was meant to map and get real numbers for the violence. Bloggers realized that the numbers on international media differed substantially from the numbers implied by the stories of families and friends in Kenya at the time.[4] Today, the Ushahidi software has been repurposed for everything from disease mapping and endangered wildlife mapping to many types of crisis mapping, most notably in finding victims of the 2010 Haitian earthquake,[5] the Syria Tracker Crisis Map[6] and the Mumbai disaster tracker. In each case, coders quickly responded to multiple chaotic streams of information by building upon the open-sourced software. For example, in Mumbai, the tracker was used to show the locations of households whose members volunteered to house people stranded by the explosions.[7] Online Netizens, the Ushahidi standby task force and impromptu volunteers quickly aggregate and verify tweets, texts and other posts against impressions from aid agencies and other credible sources. The Ushahidi team then adds those posts to the map.

*Ipaidabribe.com.* Ipaidabribe.com is a Web site that allows individuals to post when, where and under what circumstances they paid a bribe to a government official. The goal of the project is to improve public accountability in part by shaming the public administration with data-backed numbers of bribes induced as well as identifying corrupt public officials. It has spawned a large number of copycats, including 25 in China such as woxinghuile.com,[8] and Ehtisaab in Pakistan.[9]

*Al Jazeera Stream.* The Stream has been branded as a "Web community with a global TV show." It builds on social media contributions and sources to disseminate information. Partnering with Storify, Al Jazeera Stream enables users to post stories via Tweets, photos and videos. The community's conversations are organized onto a formal news platform so even passive general news watchers will see the program. The Stream has masterfully added value to both parties: its international audience, which wanted up-to-the-minute news and valued the personal and dynamic presentation; and protesters, who wanted to leverage the support of the international community. For its novelty and quality, Al Jazeera's work in Egypt has been compared with CNN's Gulf War coverage.[10]

*Global Voices.* Global Voices is an example of a mass network that has characteristics of both an RIC and an RIPP. It is made up of more than 500 bloggers and translators brought together for a specific service. They volunteer and work part time to "aggregate, curate and amplify" news from around the world. The volunteers cull from local newspapers and blogs around the world and republish the contents on a main Web site available to a global audience. Because of its deliberate global reach, the mass network is transforming from an information community into a global citizens' media platform. It has also launched an advocacy Web site and network to "help people speak out online in places where their voices are censored," and a "Rising Voices" program that offers microgrants to innovators committed to teaching and expanding citizen media techniques to populations that are unlikely to discover citizen media tools on their own.

*DAWNS.* RICs can generate RIPPs. Thus, for instance, the development blogger Tom Murphy (*A View from the Cave*) has now joined with U.N. development blogger Mark Leon Goldberg to create the *Development and Aid News Dispatch*, or *DAWNS*.[11] *DAWNS* is "a platform to promote independent humanitarian journalism and storytelling"; it seeks to generate revenue by attracting subscribers to a curated digest of development and humanitarian news, and then to recycle these funds as microgrants to writers, bloggers, photographers, citizen journalists and traditional media all over the world to allow them to tell their stories on the platform. *DAWNS* is already partnering with the U.S. Agency for International Development (USAID) in this venture.

The power of RIPPs is the power of platforms everywhere: They are, by their nature, deeply enabling and empowering technologies. They are like a renewable energy source, generating and using their own mass data. One platform can support many different mass networks, as Ushahidi does. They are less personal than RICs, in the sense that the many different users and application developers are not necessarily verbally communicating with each other. Yet conversely, the creation of a platform is a logical next step for many RICs seeking to turn conversation into action.

*Public Health Crowd-Sourced Data Analysis.* In some cases, the reciprocal information and participation platform is not necessarily a Web site but a set of tools and mobile applications. The health care community—interdisciplinary public health researchers, doctors, patients and patient caretakers—has built myriad global- and U.S.-based disease trackers that make use of mobile phones and the R&D capacity of affiliated universities. For example, the OpenData kit is a "suite of open-source tools developed by computer scientists and engineers at the University of Washington" in collaboration with others around the world. These tools make use of existing cellular networks to free users "from the constraints of traditional computer systems."[12] For example, it allows Kenyan medical workers to track and upload patient medical information directly into the medical record system using their phones. Similarly, GeoChat, developed by the InSTEDD Group,[13] is another open source technology, which allows team members in emergency situations to "connect, visualize, report, receive and coordinate data and information."[14]

However, there are also many medically related open source software programs that make use of a (slightly) wider range of participants. There is the use of Ushahidi platforms to update and track medical and pharmaceutical shortages in Kenya, Uganda, Malawi and Zambia. Additionally, the Center of Public Health Informatics at the University of Washington provides a geospatial-visualization framework for public health data via a program called EpiVue.[15] A mobile application for a program called Outbreaks Near Me asks its users to contribute reports via smart phone applications. Midway through its first year, it had been downloaded more than 110,000 times and collected more than 2,400 submissions.[16] HealthMap, the Web site for Outbreaks Near Me, aggregates online news, eyewitness reports and other disparate data sources to track the "current global state of infections."[17] The application verifies submissions as well as filters out spam, duplicates and mistaken reports.[18] GoogleFlu is an indirectly participatory program designed on the theory that searches for certain terms, especially disease-related terms, go up when someone is or knows a patient. The application generates graphs and data on the location, time and density of queries such as "flu."[19]

The greatest challenge to this kind of crowd sourcing is the verification of the data that a victim actually has the condition that she says she has. Asthmapolis solves this problem, at least for mapping asthma triggers. It is an application that geolocates and identifies the severity of asthma attacks when patients use inhalers equipped with special trackers.[20] Asthmapolis is meant to track and further the medical knowledge on environmental asthma triggers.

In these cases, the existence of a medical community committed both to public health disaster prevention and to improving medical knowledge and expertise facilitates the spread of technologies—especially novel, open source software technology. One critical point is that connectivity between an already-interacting community enabled the initial direct collaboration among a widespread and elite group to build these new technologies (the InSTEDD innovation labs, HealthMap, Open Data Kit). The resulting technologies further enable both direct (Geo Chat) and indirect collaboration (Open Data Kit, Asthmapolis, HealthMap) among a broader cross-section of the health care community.

### *Crowd-Solicitation Platforms (CSPs)*

CSPs, the third category of mass networks, also rely on crowd sourcing but in a more focused and limited way designed to allow a specific interlocutor to get particular results (funds, ideas, inventions) from a more self-selected or preselected crowd. Whereas an RIPP typically arises in response to a crisis or an ongoing problem that requires mass collaboration, or at least coordinated participation to generate solutions, a CSP operates on the principle that many hands make light work—or that two (or two thousand) brains are better than one. A CSP enables an

individual or organization to pose a specific question or to present a specific project to a mass of potential participants who can then choose whether or not to respond. These participants do not then continue their engagement with the project in the way that the crisis-mapping participants do, meaning that the flow of communication is much more bidirectional between the initiator and the crowd (and back) than multidirectional. The following are other examples of CSPs and their purposes.

*USAID Grand Challenges for Development.* USAID's Grand Challenges for Development program reaches out to the global crowd of scientists and technologists to develop solutions for specific development problems.[21] Modeled on Innocentive—a platform where companies can post R&D problems that they want solved and then pay for the best solution from a mass of freelance inventors—Grand Challenges provides sizable grants for the challenge winners to address specific problems such as reducing infant mortality, increasing literacy and providing renewable energy access for agricultural purposes.

*Crowd-Funded TV Station.* In time with the national protests surrounding Vladimir Putin's election, members of the Russian opposition are attempting to crowd-source 100 million rubles per month to operate "Social TV." This proposed online television station will broadcast social and political news as well as allow users to submit story ideas and vote on program hosts and writers.

Compared with channels that normally accrue revenue through ads and cable subscriptions, this platform offers content designers more direct information about customers' viewing preferences. The channel enables and encourages its viewers to take their engagement to a higher level, thereby potentially improving news content. The success of the project is predicted to build a more consistent and readily accessible news platform jointly preferred by opposition supporters.[22]

*Crowd Funding Against the Impunity of the Banks.* Through a local crowd-funding Web site in Spain, people raised more than €15,000. This sum was the amount of money required to submit a complaint before court and to meet the requirements to conduct a legal investigation against Bankia's management under its ex-chairman, Rodrigo Rato. The organizers hope to make the government more accountable to citizens and to break up the loyalties/relationships between the bank and government officials.[23]

These examples are a small fraction of the hundreds of crowd-solicitation ventures springing up in the development community and elsewhere. These models radically democratize the space for development solutions.

## MATRIX MAKING

### *A Functional Matrix*

The value of a typology, even a rough and tentative one, is that it begins the process of pinning down and breaking up a subject in ways that permit critical analysis and hypothesis formulation about causal relationships and potential improvements. The purpose of studying these mass networks is to examine and improve their value in helping to achieve specific development results. To this end, it is essential to connect specific types of mass networks to particular development functions. Thus, one can imagine a matrix with the categories RICs, RIPPs and CSPs down the left-hand side and different development functions (such as poverty reduction, education, health information, health treatment, accountability, agriculture and nutrition) across the top. Even imagining such a matrix immediately suggests the need for more fine-grained distinctions on both axes, but it is a start.

Creating such a functional matrix would allow us to identify issues areas where mass networks proliferate and those where they are relatively sparse. It would allow us to pinpoint smaller RICs on different development specializations, rather than identifying "the development blogosphere" or focusing on specific countries. It would in turn help link more specialized blogs and Web sites to a wider community. This happens naturally, of course. The formation of discussion networks like the prominent community members of the Kenyan diaspora—which led to the creation of Ushahidi—created access to a wealth of information by enabling input from people from previously tangential groups. For example, these networks enabled Kim Yi Dionne, the author of the blog "Haba na Haba" (@dadakim) to link Malawian blogs

that provided updates on the protest violence in the summer of 2011 to the wider development community, when western media sources were unable to do so. But the conceptual infrastructure of maps and matrices introduces a degree of rigor that helps identify holes and valuable cross-fertilization.

### *A Value Matrix*

Equally important is the creation of a value matrix, which would seek to categorize RICs, RIPPs and CSPs in terms of the specific value that each type of mass network offers for advancing particular development goals. Based on the survey above, four basic value propositions emerge.[24] The first one is improving access to expert information. RICs, like the development blogosphere, lower barriers to expert information, both from locally grounded and academically trained specialists. Second is the democratization of knowledge creation and citizen participation in public debate. Networks such as Global Voices and Al Jazeera Stream deliberately broaden participation in the framing and provision of news and thus cover topics and include voices not normally broadcasted via traditional syndicates. Third is demand-side monitoring. Mass networks, such as Ushahidi and Al Jazeera Stream, lower the costs to becoming an activist. And fourth is improved access to intellectual and material resources. Crowd-solicitation platforms like USAID's Grand Challenges enable institutions to capitalize on the diversity of external actors and their innovative solutions, which the institutions can bring to scale.

Again, thinking about a value matrix compels the intellectual and normative work of identifying the specific value of phenomena that have arisen and proliferated organically. This process will generate many additional value propositions and likely amend the four listed above. It should also focus attention on areas where mass networks are *not* actually adding value.

One critical caveat is that, like social enterprises, the value proposition must actually be valued by the targeted populations to achieve impact. Not all tools that aim to improve demand-side monitoring via mobile phones or Twitter, for example, will actually succeed. One example showcases the critical importance of factors beyond technology, such as trust and a belief in the possibility of change. In southern Tanzania, one NGO learned that access to mobile voting and complaint systems does not automatically lead to use of the technology. In a pilot, the NGO found that the local community had no faith that complaining would lead to any change and thought, "Why bother?"[25]

A focus on defining a specific value proposition requires asking what community members would find valuable in the first place and then ascertaining what tools the community wants or believes would work in achieving the valued result. It is axiomatic in the development community that technology is a tool that can be used under the right circumstances to achieve a solution, but that it cannot substitute for the elements of human relationships such as trust, political will, faith and hope. Mass networks must be subjected to the same scrutiny as any other tools in establishing their actual value for specific development purposes.

## NETWORK ANALYSIS

The foregoing is an effort to separate out and distinguish analytically what in practice is a deeply interconnected and fluid phenomenon. We have identified axes of differentiation in terms of directedness (for example, RIPPs and CSPs are more directed than RICs), versatility (RIPPs are much more versatile in terms of their adaptability for various uses than CSPs and RICs), breadth of participation (RICs are the most organic and open; RIPPs and CSPs are typically more closed due to their more targeted natures) and reciprocity (the relationship between the core and the periphery, or the requester and the audience, is most reciprocal in RIPPs, less so in CSPs, and variable in RICs). Anyone looking at the underlying organizations, however, is likely to see much more interconnection than differentiation.

Thus another way to map this territory is through network analysis—that is, by looking at how different individuals engaged in these networks are connected to one another. The three types of mass networks discussed above have mutually reinforcing relationships. Sometimes, as with Ushahidi, the idea originators and critical action takers of the other mass networks arise from RICs. More often, RICs also provide an initial audience to advertise, critique and advise, as well as to provide some of the population of the mass network for RIPPs and crowd-sourcing applications. The success of a crowd-solicited

idea and platform may in turn attract new members to RICs related to the platform. However, as with Ushahidi, an RIPP may encourage the members of another issue group or affinity group with some online presence to build a copycat application to fit their needs, as with Ipaidabribe.com, spawning additional mass networks.

Individuals can also play multiple roles within the same mass network. In the development blogosphere, for instance, participants will most likely choose one role initially, such as commenter or reader. But over time, as they gain confidence and followers, nothing prevents them from upgrading to a frequent blogger or downgrading back to commentator (as many do when they choose to close their blogs). In turn, as we saw with *A View from the Cave* and Global Voices, successful blogs and media networks can then generate platforms.

Network analysis could capture snapshots of all these interconnections by mapping the existing relationships among all these people. Equally important would be to capture offline as well as online relationships, as many mass online networks build on or combine offline best practices such as community organizing, working through business distribution channels and others. As with RIPPs, the creators of these programs repurpose or create connection technologies and (offline and online networks) to address specific problems in development.

Twaweza, for instance, is a Tanzanian organization that makes use of RIPPs and RICs. According to its Web site, it makes use of the "five networks: teachers' unions, distribution networks, mass media, mobile phones and religion."[26] For example, using mobile surveys, Twaweza secures data about public service performance and citizen needs. The collected data provide information for mobile survey participants to use. Using their relationships with traditional and social media—including the many bloggers Twaweza says it follows—Twaweza presents the compiled data not only to the survey participants but also to a wide audience to inspire additional action. Its links to large online and offline RICs provide the NGO connections to critical resources such as professors who will offer critical advice on data collection, analysis and experimental setups as well as to potential partners, like notebook distributors or newspapers, to carry out Twaweza's development activities.

All the mass networks described above have both offline and online components; much of the online community is interested in and/or working on these issues in offline forums. For example, members of the African diaspora community meet at Africa Gathering Forums and other conferences; and the HealthMap mass network is made up of health care practitioners. Remaining questions for further analysis include: What is the relationship between offline and online components of the mass networks? Does it make most sense to develop offline networks first and then move online? Or can online contacts help generate offline relationships that would otherwise not be likely to arise?

Network analysis cannot answer all these questions. But it can map the number, types and density of relationships in terms of flows of various kinds (emotions, information, resources, etc). It is a more organic mode of analysis that can complement more traditional analytics.

## QUESTIONS AND PROBLEMS

In the final analysis, getting a handle on the use of mass networks for development is a bit like assessing the creation of apps immediately after the emergence of the iPhone. Instead of identifying specific problems and proposing solutions, it makes more sense to pose a set of questions to guide general analysis of mass networks as a phenomenon and to highlight issues concerning specific policy applications. This concluding section raises some of the questions that are likely to occupy future researchers and analysts.

### *Generating New Applications*

What are the barriers to building sustainable RICs, RIPPs and CSPs? What are best practices for building them—such as branding and advertising? Is there an ideal ratio between core experts to peripheral readers and commenters? Beyond emergencies, are there specific situations that are likely to increase the potential for generating additional projects?

### *Building Directed Mass Networks*

When shifting between an RIC to a related RIPP, who is more likely to participate and under what conditions? What circumstances or specific stimuli would lead a peripheral

reader in an RIC to become more active by updating an RIPP or commenting on a crowd-sourced idea?

### *Maintaining Open Access*

To what extent should policymakers develop incentives to ensure that successful connection technologies with development applications be kept or made open source (when applicable)? Should special patents be developed? Are there other ways that intellectual property law and policy could be tweaked to encourage crowd-sourced technological solutions? Will we need to enhance safety protocols/anonymity protocols as more platforms and crowd-sourcing Web sites pop up in order to keep the costs of participating low? How should we reduce fears of participation, particularly in large data networks? How should privacy be protected?

### *Measurement*

For USAID and other foreign aid/philanthropy organizations, what standards and metrics will help identify good or potentially good interventions with respect to mass networks? How can connectedness be mapped to demonstrate the dissemination and impact of specific ideas?

### *Leadership*

How to lead within networks generally is a critical question that has occupied the business management literature for more than a decade, as well as many organizational sociologists. It is a difficult question to answer even within controlled and directed networks, much less spontaneous and reciprocal mass networks. It will be critical to track and study examples of successful leadership and to distill lessons from their experience, as well as from failed efforts to lead, orchestrate, and mobilize action within mass networks.

## CONCLUSION

The technological revolution in the development community resembles the growth of a young child's (or a teenager's) brain. Synapses are proliferating at an astonishing rate in all directions, only later to be pruned back and thickened in the mature brain. Similarly, the flux and fluidity of various mass networks as they evolve and transform themselves are not only a practical advantage but also a research and analysis challenge.

Which of the millions of networks and individual connections will survive and flourish and which will simply disappear is impossible to know. This policy brief has sought to develop the rudiments of a typology to help track different, albeit interrelated, forms of mass networks, to outline the next steps for developing matrices that will enable a more concrete and detailed analysis of value and effectiveness, and to pose initial questions about how to harness their vast potential.

## ENDNOTES

[1] The statistics on tweets per hour are relevant in light of studies demonstrating that between one and four tweets per hour is optimum for achieving maximum click through (visibility). See http://www.mediabistro.com/alltwitter/science-social-timing_b10473. Each of the feeds examined here follows that trend. Further research would be required to determine whether these three Twitter users are intentionally following that algorithm, their success in reaching the audience may be in part attributable to it. The larger point is that how even very new technologies can be used more or less strategically and effectively.

[2] Murphy (2012).

[3] "What Is Esoko?" http://www.esoko.com/about/index.php.

[4] Jeffery (2007).

[5] Ibid.

[6] Meier (2012).

[7] Economist (2011).

[8] Deng (2011).

[9] "Ehtisaab." http://209-20-73-212.static.cloud-ips.com/

[10] Jarvis (2011).

[11] "Development and Aid World News Service" (2012).

[12] Freifeld (2010).

[13] InSTEDD. (n.d.).

[14] Freifeld (2010).

[15] About Epivue. (n.d).

[16] Freifeld (2010).

[17] Healthmap (n.d.).

[18] Freifeld (2010).

[19] "Google Flu Trends: How Does This Work?" (n.d.).

[20] Asthmapolis (n.d.).

[21] USAID (n.d).

[22] Root (n.d).

[23] Moya (2012).

[24] The authors wish to thank Joshua Goldstein for suggesting this framework of analysis and significantly influencing our thinking on this point.

[25] This is from discussions at the Brookings Blum Roundtable, Aspen, August 1–3, 2012.

[26] Twaweza (n.d).

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