

GDN's Next Horizons Essay Contest 2014\*

## **THE FUTURE OF DEVELOPMENT ASSISTANCE**

Supported by the Bill and Melinda Gates Foundation

Winning Entry

### **BUILDING ON OPEN DATA AND INFORMATION TECHNOLOGIES: THE FUTURE OF RESOURCES, NARRATIVES AND COLLECTIVE INTELLIGENCE FOR DEVELOPMENT**

#### **Abstract**

Two data revolutions are changing development programming. First, the “open data” movement has pushed governments, nonprofits and companies to publicly share information. Second, the increasing availability of free, open-source and user-friendly information technologies is enabling a growing number of civic actors to collect, process and analyze their own data. This paper explores three ways communities and organizations are building on these changes: by organizing and leveraging new resources, creating new narratives, and building collective intelligence. These changes present networked, decentralized alternatives to established ideas, and are beginning to exert pressure on incumbent processes and stakeholders. The development sector has the opportunity to engage with and support their growth and their potential to complement and inform incumbent infrastructures. To do so, development organizations must learn to allow communities to prioritize where and how aid is deployed, understand changes to incentives to public offices that are urged to become more open, and focus programming on enabling this organic process to happen in a constructive, democratic manner. While this may seem like a radical change leading to an uncertain future, it is the natural corollary of giving millions of people open access to data and the ability to generate and share it.

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## Introduction: Building on Open Data and New Information Technologies

The past decade has seen the emergence of two parallel data revolutions that affect development programming. First, the “open data” movement has pushed for public sharing of information by organizations—governments, nonprofits and companies—to allow public scrutiny and transparent accountability. Second, the increasing availability of free, open-source and user-friendly information technologies is allowing a growing number of civic actors to collect, process and analyze their own data. These two trends are changing the way development is done. This paper explores the processes they are setting in motion in the development sector and how these processes should inform an understanding of how aid can be most valuable in a given country.

Open data and information technologies have given communities access to institutional processes that affect them. This has paved the way for initiatives that allow citizens to provide feedback on government services and development projects. Started in the United Kingdom, FixMyStreet (<https://www.fixmystreet.com/>) allows the public to provide feedback to the government on local urban problems. The platform has been replicated across the world, from Malaysia to Chile. In Kenya, a group of technologists and civic activists built Ushahidi (<http://www.usahidi.com/>) in 2008 in response to post-election violence. The platform allowed the public to tell and record the story of violence as they saw it from the ground. Ushahidi means “testimony” in Swahili. It was the first tool of this kind; similar tools, such as First Mile GEO (<http://firstmilegeo.com>) and Elva (<http://elva.org/>), have since been developed. This technology has been deployed in hundreds of contexts to support community reporting.

Feedback mechanisms are not the focus of this paper, but they were among the earliest examples of a broader trend, which began about a decade ago, of leveraging open data and information technologies. Lack of response has plagued feedback projects. With more open data and increased community-generated data, institutions often do not have the bandwidth to respond adequately. This technical problem is compounded by issues with the extent of openness of data.<sup>1</sup>

This paper focuses on a second generation of projects that has emerged in part as a result of this failure. These projects build on open data and information technologies to work for change to existing processes. We explore examples of these in greater detail in the next section, but the move toward a more proactive use of data can be seen by comparing FixMyStreet (feedback on urban problems) to SpaceHive (crowdfunded urban renewal) and Ushahidi (feedback on violence) to PeaceTXT (crowdsourced peace messaging).

We believe this transformation of citizen-led projects is critical to the future of development assistance. How can development organizations support these second-generation

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<sup>1</sup> Fox, “The Uncertain Relationship between Transparency and Accountability.”

strategies? As alternative infrastructures emerge that promote citizen-to-citizen solutions, how will institutions remain relevant? Can this alternative method not only get something done but also influence an existing (sometimes broken) first-generation method?

“Infrastructure,” in this context, has been described as “the technical artifacts, organizational forms, and social practices that provide background contexts for action.”<sup>2</sup> In other words, it is a mix of technical, organizational and social factors that together provide a basis for action and a framework for getting things done.

We believe the future of development lies in citizen-led initiatives that leverage open data and information technologies and work with government and development organizations, not in spite of them. This transformation affects not only what citizens do but also what existing institutions do. Thus, it requires that development organizations think and act politically and work with these newly empowered communities to create social accountability from within a society (rather than imposing it from outside).<sup>3</sup> To do this, development organizations further need to adapt to the new practices they are using, foster rules that create an enabling environment for both institutional responsiveness and civic activism, and learn together to be smart about where and how aid is deployed.

### **Recommendations for the Future of Development Assistance**

The challenge for development organizations to remain relevant is to transform the development project “marketplace” to value alternative, citizen-led networks of action. This is challenging because in order to engage with them, development organizations can no longer be in the driving seat—they need to learn to allow citizens to shape priorities for development assistance to a greater extent than they already do and focus programming efforts on creating an enabling environment for this to happen in a constructive and democratic manner.

The remainder of this paper sets out the arguments that lead us to believe citizen-led initiatives are critical to the future of development assistance. We begin by presenting case studies in three areas of transformation. We explain why our paper focuses on case studies over empirical evidence, before moving on to a framework for thinking about how citizen-led initiatives are becoming “alternative infrastructures.” The final section argues that these alternative infrastructures are no substitute for institutions, and that the development community should work with citizen initiatives to ensure they complement institutional work. Based on this analysis of the transformations underway, we recommend five approaches for the future of development assistance:

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<sup>2</sup> Kreiss, *Taking Our Country Back*.

<sup>3</sup> Tembo, “Improving Service Provision: Drawing on Collective Action Theory to Fix Incentives.”

1. *Commit to participation in funding decisions.* An important way for development organizations to allow the collective intelligence that is being created at the grassroots level to inform programs is to open up funding decisions. Too often, development organizations' funding priorities are set in a central office, dictating what programs local organizations should design through detailed calls for proposals. Moving from calls for proposals to open calls for ideas or responses to broad challenges will allow development organizations to introduce flexibility to funding, with priorities defined or influenced by collective processes. Development organizations can leverage emerging crowdfunding platforms and civic challenge competitions to this aim.
2. *Invest in scale-up.* When development organizations identify innovative practices at the grassroots level, they often provide seed funding for pilot activities. Very rarely do they go on to fund scale-up (whether that involves expansion to other locations or lengthening the original project's time span). Scaling-up a community-led effort entails risks (some will surely fail as they scale) and requires giving up control of programming to a greater extent than most organizations are used to. Yet in order to truly value and incubate community-led development efforts, investing in scale-up is critical. Development organizations can learn from the private sector to assess risk and accept failure as part of an organic process.
3. *Engage with civic activism as much as with institutional responsiveness.* Many development organizations are leveraging open data and information technologies to organize dialogue on critical development issues. However, most of these efforts aim to bring communities to a dialogue managed by an institution. This approach foregoes the rich dialogue and action already happening organically. Development organizations should continue to support institutions in engaging citizens through feedback and dialogue, but should also aim to bring the narratives and action that are emerging from within communities into policy and program development conversations, leveraging existing community platforms as well as creating institutional platforms.
4. *Work with changing organizational forms.* Alternative infrastructures that tackle development issues grow organically, tend to be ad-hoc and temporary, and have distributed decision-making processes. These three characteristics make it challenging for development organizations to engage with them. Many calls for proposals require that an organization have existed as a legal entity for a set amount of time. Successful community movements are very different, often changing organizational forms quickly to achieve specific objectives. Development organizations should find ways of working with less formally established groups, including by reformulating grant-giving procedures.
5. *Build an open ecosystem.* Although all development projects are highly context-dependent, many alternative infrastructures are transferrable across cultural

contexts. There is an important opportunity for development organizations to help build an open ecosystem of practices and ideas that supports a diverse range of initiatives. Development organizations are uniquely placed to connect citizen-led initiatives across the globe, thus supporting transparency, collaboration and responsiveness among all stakeholders. Development organizations should refocus their approach to act as the connective tissue of a network, rather than set priorities through a funding hierarchy. Ultimately, the future of development assistance will be defined by highly localized initiatives networked globally by this connective tissue.

### **Three Areas of Transformation: Resources, Narratives and Collective Intelligence**

#### **Organizing and Leveraging Resources**

The opening of data can lead to a radical new awareness of the distribution of resources, and can generate fresh insights about the demands and needs of potential beneficiaries. The emergence of civic crowdfunding demonstrates that open data and new information technologies can enable individuals and communities to organize to better understand and leverage existing resources and to advocate for more resources to meet their needs. This new potential agency may be particularly potent among underserved and marginal communities who have historically lacked access to resources and had a limited understanding of both their current capacities and how to improve them.

Civic crowdfunding—the use of online fundraising platforms to build community services such as parks, community centers and educational programs—is based on open data related to planning processes and land use. Civic crowdfunding platforms provide the infrastructure for individuals and groups to take the insights gleaned from data, collect additional community-generated data and directly influence the shaping of their environment, by building campaigns to promote the change they would like to see.

The United Kingdom–based platform Spacehive (<https://spacehive.com/>), one of the first examples of this idea, has built partnerships between its users and municipal governments across the country, enabling them to work together on initiatives such as converting underused spaces into community gardens, installing public Wi-Fi networks and opening youth entrepreneurship education centers. These successful civic crowdfunding projects in turn create pressure for more transparency and openness in the planning process, by demonstrating public demand and appetite to engage with these processes.

Communities, energized by access to data and the ability to work for positive change, are motivated to seek a better understanding of how the processes and institutions that serve them are working—and to contribute to their improvement. The New York–based civic crowdfunding platform ioby (<http://www.ioby.org/>) allows its users to volunteer their time as well as make donations, and finds that almost two-thirds of donors do so. In this way, the platform is enabling communities to unearth and to gather a wide range of resources on which they can draw.

The potential to leverage new resources goes far beyond streetscape and neighborhood improvements, and is beginning to gain traction in middle- and low-income countries as an alternative way to tackle pervasive development problems. In Lima, Intercorp launched PeruChamps (<http://peruchamps.org/en>), a crowdfunding site that enables underprivileged school children to raise money to fund their education, while in Nepal, Possible Health (<http://possiblehealth.org>) has created Nyaya to providing funding for healthcare to some of the country's neediest patients. These platforms are generating highly localized, small-scale open data about the educational and health needs of their users, and by demonstrating the audience's desire to contribute to these projects, giving impetus to transparency efforts in those countries.

For development organizations, there is a compelling opportunity to partner with the communities and organizations that are advancing this type of work, to leverage the power of networked resource development, and to incorporate it into development assistance programs. Such collaborations are being piloted around the world. The U.S. State Department this year launched a pilot crowdfunding initiative, (<http://rockethub.com/projects/partner/socialimpact>), to help 33 previous grantees of its entrepreneurship programs to seek second-round funding for their ideas, the first example of government-supported crowdfunding for development. The projects in the initiative include an HIV prevention social marketing campaign in Sierra Leone, a seed fund for female entrepreneurs in Nicaragua, and a social impact crowdfunding platform in Macedonia.

Development organizations can also learn from a model being piloted in Kansas City, MO, the Community Capital Fund (<https://www.indiegogo.com/partners/ccap>), which uses crowdfunding to support cooperation between social impact grantmakers and grassroots organizations. The Kansas City Community Capital Fund, which supports social impact projects among underserved communities in the city, has for the past two years asked its grantees to crowdfund a portion of their total budget, to build fundraising capacity and expertise among those communities. In 2014 all five of its grantees met their fundraising targets, with projects including the rehabilitation of a derelict street block, a youth education program and a community garden.<sup>4</sup>

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<sup>4</sup> The term "civic" in "civic crowdfunding" is clearly contested. To some it might imply projects that are funded entirely by citizens, by public or quasi-public entities including government, or a combination of the two. To avoid confusion around the definition of "civic," Davies, in *Civic Crowdfunding: Participatory Communities, Entrepreneurs and the Political Economy of Place* (p. 29), argued that the definition should originate from the goods being produced, not the source of the funding: "Civic crowdfunding projects can therefore be defined as projects that produce some non-rival benefits that serve either the non-excludable public or broad sections of it."

## Making Space for New Narratives

In many developing countries, opening up data on issues of public concern is either not politically viable or the available data are of poor quality. New information technology tools allow civic actors to step into this gap, combining the available open data with their own data. In this way, information technology tools provide new, creative ways for civic actors to foster alternative discourses and challenge prevailing narratives. These new visions can often compete with existing visions by being bolder and engaging more closely with their audience.

When governments refuse to share data on sensitive topics, citizen journalism and community data collection often fill the gap. In Sri Lanka, Groundviews (<http://groundviews.org/>) enables citizen journalists to offer alternative perspectives on governance, human rights, peace building and other issues. The site is credited with being the only source for controversial topics linked to the conflict and the only media outlet regularly challenging attitudes toward peace and conflict. By introducing new narratives, citizen journalism and data collection platforms are helping to break the deadlock in sensitive situations, challenging public perceptions and shifting attitudes. In Somalia, the Puntland Development Research Centre works to engage hard-to-reach communities on dialogue about key issues related to peace, civic participation and reconciliation. These dialogues leverage data and technology in two ways: by deploying tech-enabled participatory polling to collect data on public perceptions, and by using mobile film screenings to inform people and begin transformative conversations.<sup>5</sup>

At times, the creation of new narratives is a catalyst for community advocacy. In India, the I Paid a Bribe movement (<http://www.ipaidabribe.com/>) encourages individuals to publicly report when they have paid, or refused to pay, a bribe. The campaign has received nearly 30,000 reports since its inception. The campaign website has become a reference point for information about correct administrative procedures, slowly building an anticorruption movement from the ground up. The campaign has also used its data to lobby the government on corruption issues.

In Kenya, Muslims for Human Rights organizes social audits to monitor projects funded through Kenya's Constituency Development Fund.<sup>6</sup> Muslims for Human Rights used data available from the government to identify key implementation problems (such as inflated

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<sup>5</sup> Nordstrom, "Tailored Technology for Peace."

<sup>6</sup> The Constituency Development Fund provides every member of Parliament with \$1 million per year to spend on poverty-reduction projects. On paper, it is structured to involve communities in the selection of development projects and management of project funds. In practice, Muslims for Human Rights found, the fund's management was shrouded in secrecy and inaccessible to community members.

costs, irregularities in bills and preferential selection of contractors), and then collected information during project site visits through both physical verification and interviews with local people. The results of this social audit were shared in public hearings that brought together thousands of community members and local members of Parliament, allowing a dialogue to begin on local corruption issues.<sup>7</sup>

Development organizations often support initiatives that use data and technology to make space for new narratives. Groundviews has been supported by the Ford Foundation. The Puntland Development Research Centre receives funding and technical support from Interpeace. Muslims for Human Rights receives similar support for its social audit work from the Open Society Foundations. In certain contexts, organizations may not be allowed to accept funding from foreign sources to promote an alternative discourse. Nonetheless, the growth in new civic narratives based on open data and information-technology tools provides an opportunity for development organizations to seek out and support these initiatives as the foundation of grassroots social change. These new visions are infused with the practical realities with which everyday people interact. They not only become part of the struggle for reforming and working in this reality; they can also provide a better understanding of how aid can be best delivered in a given country.

### **Unleashing the Power of Collective Intelligence**

The concept “collective intelligence” posits that shared knowledge and insight emerge from collaborative data sharing and result in a shift of power from the individual to the collective. Critically for this discussion, collective intelligence is enabled by group processing of information, which is only possible when data are open and networked information technologies are available. This networked processing of information both enhances social knowledge and expands group interactions. By empowering groups to take collective action and engage in consensus community planning, collective intelligence has the potential to change development processes.

The ability to share information can enable collective action on more effective and creative solutions for the toughest development problems. The Sudanese Development Initiative, which works with conflict-prone communities along migratory routes in Darfur, has found that enhancing information flows along the routes can help prevent conflict by allowing collective early responses to emerging tensions. The organization has been running a community communications system that uses text messaging and radio to share information, and has recorded overwhelmingly positive experiences of collective action that have emerged from it.

Collective intelligence can support both positive and negative collective action; calls to violent action can spread quickly over mobile phones and the internet. In Kenya, local

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<sup>7</sup> Open Society Foundations, *Community Monitoring and Participatory Auditing*.

peacebuilders are using the same tools as violent groups to counter negative campaigns by mobilizing collective expression of positive messaging. Sisi Ni Amani (<http://www.sisiniamani.org/>) runs the PeaceTXT program, which reaches out to people in areas where calls to violence are spreading to propose a moment of reflection. Community members identify such critical times and report to the Sisi Ni Amani team, which then sends out a targeted text message.

The use of collective intelligence to influence attitudes in critical times is not limited to peace messaging. Games for Peace (<http://gamesforpeace.org/>) works with teenagers in Israel and Palestine to collaboratively build peace villages on Minecraft. Like other collaborative online games, Minecraft depends on collective intelligence to expand. Even though the outputs are produced within the confines of a fantasy game environment, Games for Peace nevertheless demonstrates the power of bringing together the collective knowledge of Israeli and Palestinian players through a game to imagine a joint future.

Collective intelligence does not just support response to conflict crises; it can also be the foundation for community planning. In Sudan, the United Nations Development Programme's Crisis and Recovery Mapping and Analysis project made the data held by all United Nations agencies operating in Sudan public. This was the first time that all United Nations data in a country were turned into open data. The project then ran participatory mapping processes in communities across Sudan to compare local perceptions of development challenges against these open data. The overlays and comparisons were shared with local communities and state governments, leading to the first participatory process for development of state strategic plans.<sup>8</sup>

For development organizations, there is an opportunity to build more robust interfaces between collective awareness projects like the ones described above and existing development assistance processes. Work on this is already underway. For example, PeaceTXT shares its data on community tensions with Kenya's national Conflict Early Warning and Early Response Unit in the Ministry of Interior.

Information sharing is a good first step but does not integrate grassroots collective action with institutional interventions. The experience of the Crisis and Recovery Mapping and Analysis project points the way for participatory processes where communities both inform development planning and collaborate with institutions to find and implement development assistance solutions. Development organizations could further develop this potential by drawing on research in the "smart cities" movement that suggests that smart cities are not

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<sup>8</sup> Alshaikh and Larrauri, *Building Resilience through Crisis Mapping, Community Engagement and Recovery Planning in Sudan*.

centralized, but rather rely on a network of citizens that make up the collective intelligence of the city.<sup>9</sup>

### **From Examples to Empirical Evidence**

Much of this paper's argument builds on practitioners' questions and comments. We have illustrated our points with examples from existing practices and experience. However, we also acknowledge the need for robust empirical evidence to back up our arguments. Our challenge is that, to our knowledge, such empirical evidence does not yet exist.<sup>10</sup> We believe future research should look into two areas.

The first is a comprehensive mapping of projects affected by the paradigm shift we outline, including: (1) the number and growth trends of citizen-to-citizen development assistance projects over the past decade, with special attention to crowdfunded projects; (2) the number and growth trends of development projects that leverage open data or open-source software; and (3) the overlap between these two trends.

Second, impact studies could help make an empirical argument about the efficacy or efficiency of funds allocated to citizen-to-citizen initiatives.<sup>11</sup> These could both directly evaluate these initiatives and compare their impact with that of other development projects.

### **The Emergence of Alternative Infrastructures**

Despite the absence of empirical evidence, the examples described above highlight an emerging trend: open data and information technologies encourage decentralization and distribution of knowledge. This trend is important for three reasons, which extend far beyond data and technology.

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<sup>9</sup> See for example Schaffers et al., "Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation."

<sup>10</sup> Some statistics are available on crowdfunded civic projects as a proportion of all crowdfunded projects (but not as compared to global development assistance). Of the \$6 billion that is raised globally by crowdfunding each year, \$1.2 billion is given to donation-based platforms. Davies ("Civic Crowdfunding—Four Things We Know, Two Things We Don't") found that platforms specifically catering to civic donation-based initiatives raised \$10.74 million between 2010 and 2014, spread across 1,224 projects.

<sup>11</sup> To our knowledge, none of the projects described here carried out impact evaluations. The only relevant empirical work we are familiar with focuses on specific tools, such as the Voix des Kivus project, a crowd-seeding system in the eastern Congo that uses cell phones (Van der Windt and Humphreys, "Crowdseeding in Eastern Congo Using Cell Phones To Collect Conflict Events Data in Real Time").

First, it creates the space for openness and transparency. As citizens organized to conduct social audits in the Muslims for Human Rights campaign, it became impossible to hide corrupt practices in the closed processes and budgetary maneuvers of an implementing agency. As citizens make use of crowdfunding platforms to understand local problems and propose solutions, it becomes impossible for central planning agencies to ignore the needs of marginalized communities. If we know that corruption and neglect of marginalized groups are most likely to occur in systems where information is tightly controlled, projects to promote good governance should seek to be closely connected to their stakeholders, flexible and transparent.

Second, it enables knowledge and ideas to circulate among populations in ways that are meaningful and durable. The power of decentralized data sharing is evident, for example, in how quickly hate speech and calls to violence can spread over online media. PeaceTXT was set up in direct response to this insight, using the same technique (viral text messages) used to incite violence. If the most effective forms of hate speech are those that are easy to replicate and share, so are the most effective forms of messaging for positive behavior change.

Third, it makes it possible to build organizations that function like networks, using open data and information technologies to remain responsive to circumstances and to empower many individuals to take independent, creative action toward a shared goal. There is great power in organizing in this way, as is demonstrated, for instance, by the use of decentralized, network-based data technologies by violent nonstate actors. The Islamic State of Iraq and Syria actively recruits on social networks, using a plethora of Twitter accounts to get out its message. When Twitter recently moved to ban accounts associated with the Islamic State, its activists quickly moved to the open-source, decentralized social network Diaspora.<sup>12</sup> The Syrian Electronic Army or Syria Hackers Army is a collection of computer hackers who support President Bashar al-Assad (and are allegedly supported and organized by his government) and use a number of techniques, mostly defacement of websites and denial-of-service attacks, to target news websites, human rights websites and online applications that can help antigovernment activists.

If some of the most dangerous groups in the world are using decentralization powered by information technologies to leverage a multiplicity of parallel actions in their favor, then peacebuilding cannot neglect this approach either.

As citizens realize the creative power of decentralized structures that leverage open and community-driven data, supported by technology, they are taking action in ways that seem to challenge existing organizational models. Alternative infrastructures are emerging—new

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<sup>12</sup> Cook, “ISIS Takes to Crowdfunded Social Network after Twitter Bans Graphic Images.”

methods and practices created by groups for whom existing methods are not working satisfactorily.

Some of the features of these alternative infrastructures that help identify them are that they grow organically, tend to be ad-hoc and temporary in nature, have distributed decision-making processes, and are transferrable across cultural contexts. The three types of initiatives described above—which produce resources, narratives and collective intelligence—share these features. They mostly occur outside established official development assistance processes, but the networked and decentralized alternatives they provide are beginning to exert pressure on established processes and to influence stakeholders.

### **From Alternative Infrastructures to Complementary Infrastructures**

The examples described in this paper highlight a fundamental tension between emerging alternative infrastructures and existing institutions: While open data and information technologies encourage decentralization and distribution of knowledge, many of the most important civic and development organizations remain highly centralized. How can a decentralized model of citizen action for local development interface with a centralized model of citizen engagement for development assistance? Is it possible for these alternative approaches to grow into complementary infrastructures that supplement and inform incumbent ones?

We argue that yes, this is possible, given the right level and type of engagement from the owners of incumbent development-assistance processes and infrastructures. Organizations are beginning to value and encourage community-led development efforts, to bring the narratives that are emerging from within communities into program development conversations, and to allow the collective intelligence that is being created at the grassroots level to inform decision-making. But these efforts are in their infancy, and need to be built up dramatically.

Indeed, if thinkers such as Clay Shirky are correct, it may be very much in the interest of incumbent institutions to begin this conversation, since the emergence of networked society points, in the long term, to the decline of large institutions.<sup>13</sup> This does not mean that large development organizations will disappear, but it may mean that the future of development assistance will not be characterized by large, monolithic bodies. Instead we may look to a future that is built on an open ecosystem of practices and ideas that supports a diverse range of initiatives and emphasizes transparency, collaboration and responsiveness among all stakeholders.

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<sup>13</sup> Shirky, *Here Comes Everybody: The Power of Organizing Without Organizations*.

This may seem to some like a radical change leading to an uncertain future, but it is the natural corollary of giving millions of people open access to data and the ability to generate and share their own data. The development sector should embrace these changes and seek to grow in tandem with them.

To do this, the development sector will need to address three important challenges. First, the spread of new funding opportunities creates the potential for great inequalities in the use of those opportunities. Large online open markets are often highly skewed, with the majority of the resources concentrated among a small percentage of participants.<sup>14</sup> It is likely that, for instance, in civic crowdfunding, well-resourced communities may be better placed to take advantage of the opportunity to develop further resources and to advocate for their interests. There is therefore an important role for development organizations to play in incentivizing the use of these opportunities by the communities that could most benefit from them. One example of this is match-funding of crowdfunding campaigns by mission-driven organizations, such as the Kapor Foundation's contribution to a campaign by Black Girls Code, which trains young African-American women to be software developers.<sup>15</sup>

Second, the proliferation of opportunities for individuals to create new narratives and highlight fresh stories may lead to the fragmentation of narratives. Participants and stakeholders alike may feel confused by the array of voices that they hear and have difficulty judging the veracity and strength of different arguments. This is a challenging issue, but not a new one, since every community and context has a plethora of competing and conflicting narratives. While in the past these narratives may have been parsed and simplified by particular actors (often with the best of intentions), their true complexity is no longer hidden by these processes.

Third, in repressive societies, it can be difficult for citizen-led alternative infrastructures to work with existing institutions. Their push for democratic change can be highly destabilizing, yet encouraging these infrastructures to become more stabilizing and complementary may be meaningless to social change if rights and freedoms are not respected by existing institutions. This may at times require civic actors to continue working through alternative infrastructures and accept temporary instability in the pursuit of positive social change.<sup>16</sup>

Understanding the mechanisms by which open data and information technologies affect development processes at the community level is not merely an academic endeavor. It is critically important to development programming and to the future of development

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<sup>14</sup> See Davies, *Civic Crowdfunding: Participatory Communities*; Agrawal et al., *Some Simple Economics of Crowdfunding*.

<sup>15</sup> James, "The Ultimate Matching Grant."

<sup>16</sup> Thanks to Amy Noreuil for pointing out the distinction between alternative and complementary infrastructures.

assistance. As communities build on open data, generate their own data, and use both to create new means of development, civic engagement and social impact, the picture for the field of development becomes inexorably more complex. It also demands greater responsibility and engagement from development professionals to understand the changing landscape, incorporate new practices, and help co-create the new future of development with a broader set of stakeholders.

The emerging trends described above—offering new ways to acquire resources, create narratives, and promote collective intelligence—point to the emergence of a new type of citizenship, more concerned about building relations and taking action with other citizens than with institutions.

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