

Information Ecosystems and International Development

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Abstract. This paper looks at the purpose of developing linked open data applications of value to poorer and less well connected potential users and considers some of the challenges that need to be met if this purpose is to be achieved. It stresses the different societal contexts in which such applications will be deployed and describes some of the potential negative and unintended consequences of enthusiastic but ill prepared initiatives. It describes the development information environment as one of overlapping information ecologies, which, as the metaphor implies, contains both interdependencies and examples of predatory, counter developmental behaviours. From this analysis it suggests a few key areas which combine the potential of real value for users with exciting and ground breaking technological challenges.

1 Introduction

The Downscale 2012 workshop asks software producers¹ to think of the four billion people who do not have access to the internet when designing linked open data platforms and to aim to reduce rather than add to the digital divide. This request seems entirely consistent with the purpose behind many existing linked open data initiatives, which seek to promote greater equity in governance through enabling higher levels of transparency and accountability. It could indeed be said that it is hard to see the point of an interest in linked open data solutions without having an interest in their potential social impact. If this is indeed a common perspective within the linked open data community, then the questions of what social impact is intended and how it may be achieved need to be taken seriously.

This paper, whilst commending the Downscale initiative, argues that the relationship between information and poverty is far more complex than a simple lack of access to communications channels or indeed to information itself. It suggests that deeper study of the potential of information to combat poverty is required. Such deeper study needs, in each situation, to include the specific dynamics of any particular type of information and of the situation in which any

¹ To avoid confusion, we use the word “development” to relate to the field of international development, struggles against poverty etc. and thus must use another word to describe the development and developers of software and other technical solutions

intended user group finds itself. However, some general points can perhaps be outlined here. The desired result of such preparatory work is to identify issues in people's informational needs which pose new technical challenges as well as to become aware of and build meaningful collaborations within the social and organisational contexts in which any technical solutions will be applied.

2 Information and International Development

This paper is also located within a discourse about "international development". The author participated at a panel discussion at ICTD 2011 at which considerable scepticism was expressed by a predominantly technical audience about the relevance of the international development sector. Some argued that the idea of top down investment in processes of poverty alleviation involved outsiders telling other people what they should do and was therefore patronising. Others suggested that such efforts had been largely ineffective and therefore need not be taken into account. In this author's opinion, there is some merit in both arguments. It is also undeniably the case that much economic and social development, including innovation with ICT, emerges from the internal dynamics of local societies and has no relation to the purposeful efforts of international development actors. That said, the sector is a significant presence in many parts of the developing world. Definitions of what constitutes "official development assistance" vary, but the OECD² calculated that it amounted to USD 127.6 billion in 2010. When we consider that some USD 2-3 billion of that amount is spent by professional development organisations just on their own information systems, including their linked open data platforms, we can see that the sector is inevitably going to impact on the information landscape. It has the potential both to offer resources and co-ordination to solutions which will help the poor or, as has been argued elsewhere, to worsen the digital divide³. It is also the case that history of international development efforts is littered with examples of "technical experts", including in the ICT4D field, failing to recognise or adapt to the socio-cultural or physical specificities of the new environments in which they were working and thus failing spectacularly. Thus for the lessons of its failures as much as its successes, as well as for its exchanges of ideas and the opportunities it offers to build collaborations, it would be unwise to ignore the work of the development sector.

Indeed one starting point for any information and development initiative should be a clear understanding of what is meant by development. Leaving aside the large number of examples which could legitimately be given of development assistance being applied for the direct economic or political benefit of the donor,

² OECD, Query Wizard for International Development Statistics, accessed September 15th 2011

³ See Powell, Davies and Taylor, 2012 "ICT for or against development? An introduction to the ongoing case of Web 3". IKM Emergent Working Paper, in press. The paper takes an historical overview of the use of ICT within the development sector and looks more particularly at early linked open data initiatives within it.

there are longstanding and legitimate debates on what types of development strategy are likely to be most effective. Is it more useful to attempt to support the general development of a poorer country in the expectation that resulting growth and educational improvements will spread to all sectors of society and, because of their wider base, be more sustainable? Or is it better to target interventions at the specific needs and challenges of the poorest and most marginalised? As Wright *et al* [1] explain in their recommendations on Open Government Data in India:

“ The meaning of “open government data” and the purposes it serves will have to be re-examined from an Indian perspective. The reasons that work well in the US and the UK may not work well in India. We also have to be very careful about how we imagine the end-users of open government data. Do we visualise open data as being for the benefit of individual middle-class citizens by helping them to consume (processed) data themselves (with bus routes, for instance), or do we visualise them as being for the benefit of the poor, and thus target NGOs? Do we visualise them as being hackers or laypersons? ” (P 40)

This question is fundamental for any information-led development initiative, including those concerned only with data. If “development” initiatives are intended to be of direct benefit to the poorest, this implies improving the relative position of the poor in relation to the rest of society, or, if we are thinking in terms of societies, the relative position of a poor country in relation to global levels. Given that information by itself is of little value without the capacity to make use of it and that such capacity is strongly linked to educational levels, it follows that simply making information more generally accessible is likely to worsen not improve such relative positions. Wright *et al.*, in the paper cited above, highlight the danger of what they call “elite capture of transparency”⁴, whereby information coming from or intended to benefit poor people is captured and exploited by others, a process which would be familiar to students of the uptake and use of public health services in Europe. Thus simply enabling the provision of data or information alone is not adequate. Questions need to be posed as to what information would be of particular value to particular groups.

Equally important are issues of how information is provided and curated and to what extent the people using and producing the information have any control over the process. These issues relate to power and profit but also to culture. All societies are based on sets of cultural understandings which may be more or less homogeneous, more or less dynamic in each situation. In recent years changes in informational behaviours have led to new understandings of the interaction of information and culture in many parts of the world. However, as an UNRISD

⁴ A full case study, also referred to by Wright, is Benjamin, S. Bhuvanewari, R. Rajan, P. and Manjunatha 2007 “Bhoomi: ‘E-Governance’, Or, An Anti-Politics Machine Necessary to Globalize Bangalore?” A CASUM-m Working Paper <http://casumm.files.wordpress.com/2008/09/bhoomi-e-governance.pdf>

workshop in the run up to the first global summit on the “Information Society” (WSIS) concluded: “it is a serious mistake to assume that they constitute a uniform process globally or share a common destination, rather than a variety of new processes each influencing and being influenced by the society in which they are taking place.” [2]. Nor are such changes likely to be uniform within individual societies. In a country such as the UK, for example, informational behaviour of an individual might be expected to depend in large degree on their age, education, social and professional networks as well, possibly, on their class, gender and ethnic origin. This is of particular importance in the context of linked open data which, in its European and North American manifestations, is very much associated with ideas of openness of information and with the role of the engaged “hacktivist” committed to interpreting and putting to public use the data made available. In our view, this model of open data leading to new analysis and real change remains largely aspirational even in those environments with the greatest quantity of linked open data and the highest density of “hacktivists”. It is a long way from being a realistic model for change in other environments as both the Web Foundation’s “Open Government Data Feasibility Studies”⁵ and Wright *et al.*’s study in India indicate. Whilst some such attitudes and skills may be shared especially amongst the most computer literate in many places, it is a mistake to assume that such ideas will always be seen as positive and beneficial. This is not intended as an argument against initiatives which promote the use of linked open data but to reinforce the point that, as with any form of “aid”, what is done and how needs to be negotiated with those whom it is intended to benefit.

3 Information Ecology

The development information environment is multi-faceted and complex. It extends from the global to the entirely local, it covers a multitude of disciplines, cultures and languages. It operates on many levels. It can be understood as a series of overlapping information ecologies. The value of this metaphor is threefold. As predators form part of natural ecologies, so power relations impact on human ones. Ecologies are complex adaptive systems, so that an action in one part of them will have impacts elsewhere. Arguably, they are also systems which can benefit from being purposefully looked after: it is certainly possible to damage them, perhaps also to nurture them.

One feature of the power imbalances in the development field is the influence of large, well resourced institutions using large data sets from which to generate generalised policy approaches which are then applied to local situations. This process can ignore the specificities of local circumstances and limit the freedom of people working at more local levels to develop policy which seems appropriate to them. In a similar vein, such organisations (and many others) justify their roles by making extravagant claims about the value of their knowledge and

⁵ In Chile and Ghana. See <http://www.webfoundation.org/projects/ogd-feasibility/>

implying that the main challenge of development is getting this knowledge to the people who need it. This was an explicit argument behind the World Bank's claim to be a "knowledge bank" in the late 1990s. Such attitudes lead to one-way information flows which are often not based on sufficient information about their intended recipients for the information to be of much value. As importantly, it can be hard for information about the realities on the ground, those realities which the whole effort is intended to improve, to get fed into and used in these policy making and communications processes.

Another aspect of the development information ecology is that although there is a certain attempt to maintain a common purpose of "co-operation for the common good" across the sector, most development organisations are in an increasingly competitive environment when it comes to seeking funds. This means both that they try to emphasise the origin and value of "their" information, for example by seeking to encourage direct traffic through their own web site and also that they often have few resources to invest in collaborative information initiatives. This, as well as the complexity of the quantities and ranges of information that is relevant to development, has resulted in a very fragmented information environment. With a few exceptions, mainly limited to certain well defined communities of interest, information resources are highly dispersed, metadata is poor, and the inbuilt algorithms of most search engines tend to recognise and reproduce the influence of the more powerful information providers.

If the above concentrates on the information ecology as it exists for professional development organisations working at international level, the situation for community level organisations and for individuals, marginalised or living in poverty is even worse. A fragmented information environment is inconvenient and inefficient for someone working in an office in Geneva, for someone relying on a pay per minute connection in an internet café in Africa it is impossible. Despite all the rhetoric about knowledge equating to power and the large ICT and communications budgets of the sector as a whole, there are incredibly few resources made available to support information processes which go beyond the idea of the passive recipient. "Passive recipients" are of no value to development. What is needed is for people to respond to information, understand it, adapt it to their own circumstances and to use it: or, in other words, to go through the process whereby information becomes knowledge. As has been argued elsewhere:

Formal education undoubtedly helps, but so can many other forms of human interaction. People need to be able to validate information and to think through if and how any of it may be useful to them. In this context, and whatever other mechanisms may be available to help the process, connections with other people are essential, not only as sources of information, but also as means of validation, reflection and action. This is true for everyone - from the fraternity clubs of elite US universities to networks of the most poor and marginalised. "Ki raflé du ki amul yeéré wayé moy ki amul nit", as a Senegalese proverb has it, "the poor person is not the one without clothes but the one without anyone." [3]

The same chapter argues that most people, however marginalised, take part in a number of informational spaces, “some geared to family matters and social obligations, others related to work and income, some perhaps related to politics and governance and to faith” (p 134). These spaces, each of which will have their own rules and norms depending on their character and purpose, are seldom seen as part of the development knowledge ecology, but in fact they are key to knowledge being created and used by the people who’s actions determine whether or not any development actually takes place. At least some of these spaces are also open to interaction with external supporters but very little work has been done at this level to really understand what types of information are most useful to participants, to what extent and how digital platforms can be used, what issues of privacy and restricting access arise. It is an area of huge potential but also of many difficulties.

Value: in many countries much government data is inaccurate or incomplete, often out of date and, whatever the legal requirements may be, often hard to hold of⁶. In the absence of reliable free information, some have sought to develop enterprise models which either reward the generation of data and/or seek to charge for its use⁷. These models may offer better value than public information but, if the end-user has to pay for the data thus provided, are likely to be of less benefit to the very poor.

Security: in the wrong circumstances even the most apparently innocuous information can be misused. Ushahidi⁸, in Kenya, rightly attracted a lot of attention by its ability to use crowd-sourcing to map emerging troublespots in the violence that erupted after that country’s elections in 2008. In doing so, the organisation, locally based and in touch with the many of the elements in Kenyan society working to end the violence, will have had to exercise judgement as to what information to make public. The same information, used differently, could have had disastrous consequences as was demonstrated by the use of Radio Mille Collines as an agent of the genocide in Rwanda.

Cost: the factor of cost is ever present. Amidst the marvelling at the growth of mobile phone usage in Africa, issues of inclusion and exclusion can easily get lost. As mobile phones become the main vehicle for communication across extended families, the poor are left with the choice of paying up - sometimes over 20% of their income - or removing themselves from their most life affirming community. Likewise, and in a cautionary tale for any proposed support of informational spaces, poor women in Zambia found themselves excluded from networks specifically set up to “empower” them (See, for example, [4]).

⁶ In addition to the two Web Foundation reports cited in vii above, see Raman, N (2012) “Collecting data in Chennai City and the limits of openness” and Raman, B. 2012, “The Rhetoric of Transparency and its Reality: Transparent Territories, Opaque Power and Empowerment” both in *Community Informatics* 8:2, Special Issue: Community Informatics and Open Government Data <http://ci-journal.net/index.php/ciej/issue/view/41>

⁷ See for example <http://www.esoko.com/about/>

⁸ <http://www.usahidi.com/>

Control: much current discourse about information, particularly in Europe and North America, concerns the desirability of its freedom. However other cultures may have other perspectives. For example, in New Zealand the indigenous Maori community believe that information about their ancestors belongs to them and is a vital part of their identity. The insistence of the colonial authorities in collecting and retaining information about individual families was a historic bone of contention which has been re-ignited by the idea that the government had the right to put such records on-line⁹.

4 Implications for Developmental Linked Open Information Initiatives

All of the above pose a number of challenges for anyone wanting to develop linked information solutions in a way which goes beyond the basic connection to actually the poor and the marginalised to improve their conditions. It underlines the need for real understanding of local contexts, the desirability of working with local partners, and the value of participatory engagement with information providers and users if good choices are to be made about process, content and platform. Some of the challenges are of a general nature, others are more directly connected to issues of linking data and information.

- The need for caution in becoming over reliant the data of powerful institutions like the World Bank and OECD. It is hard to avoid using their data and it is of course positive that they are increasingly making their data openly available, so that it becomes a valuable resource to query. On the other hand, constant reference to these sources can appear to reinforce their dominant roles in the development information ecology and privilege the types of evidence favoured by global policy makers over evidence which enables learning from local contexts.
- In the same vein, there is a pressing need to make sure all relevant voices are heard and that data and other information from the grass roots becomes more visible
- The term “linked open information” rather than “data” is used in the sub-heading above because, if the aim is to support the information needs of the poor, there is no point in privileging data over other types of information. In the situations we are discussing, people are generally lacking many types of information. This poses the challenge, which to some extent has been explored in the IKM Emergent Programme¹⁰, of using RDF and other data-linking tools to create links to metadata about other forms of information and to related social media discussions

⁹ Plenary floor exchange at First Global Congress on Community Networking, Barcelona, Nov 2000

¹⁰ See http://wiki.ikmemergent.net/index.php/Workspaces:1._Information_artefacts and http://wiki.ikmemergent.net/index.php/Workspaces:1:Linked_Open_Data

- Work on data itself, especially government data, in developing countries is likely to involve political and technical issues to improve its availability, accuracy and timeliness as much as technical development. It may also involve initiatives aimed at deriving data from crowd sourcing, a practice of which there are already examples from India and Kenya.
- The issues of the platform and the affordability of its use is crucial. Mobile Phones are an obvious choice but the cost of their use, particularly for higher bandwidth applications can be prohibitive. It may make sense to explore the potential for partnerships with resource centres, telecentres or, where they exist, libraries.
- Reusing schema can generate links simply and efficiently but again raises issues of politics and influence in whose schema are used. Standards also need to be established to avoid the development of an “official” development linked open data in which the powerful professional organisations exchange data and which excludes interaction with other sources of information and data
- Developing thesauri and ontologies capable of transcending the multi-lingual, multi-disciplinary realities of development will be a real challenge for what are referred to in the literature as “emergent ontologies”, “heterogeneous ontologies” or “dynamic networked ontologies”. The issue of “semantic interoperability” is also highlighted in the “Report on Open Government Data in India” cited above.

5 Conclusion

Finally, as the authors of a report on women’s use of ICT in Mozambique conclude, there are limits to what can be achieved by the use of ICTs alone. Their impact can be immeasurably strengthened if they can be deployed alongside other more traditional tools of empowerment.

“ Literacy is key - without literacy there can be no empowerment, particularly for women and girls. We therefore strongly recommend the improvement of women’s literacy in rural areas. We believe that women’s literacy, combined with increased relevance of content, could result in computer-related ICT tools becoming an asset to women’s pursuit of the means for survival and for control of their lives. ” [5]

What this conclusion suggests, apart from the point it so clearly makes, is that the process of linking information with meaningful change is far from straightforward and is unlikely to be taken very far by the development of one set of technologies, produced in isolation. Collaboration in more broadly based change efforts perhaps offers a better chance of greater impact as well as providing an opportunity for the discussions of assumptions, needs and options with people, rooted in their communities, to better understand their needs and create a process of mutual learning.

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