

Learning about Analysing Networks to Support Development Work?

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This paper was prompted by presenting our work at a workshop organised by the Danish NGO Network (DDRN 2010), and by our experiences of working with Gamos and the IRC International Water and Sanitation Centre. In particular, it draws on the experience of our partner, Gamos, who has been working with this type of analysis for the last seven years. ILT has been exploring the use of network analysis to understand our own, our partners', and the intermediary sector's networks.

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Introduction

Everyone seems to be talking about networks. Networks and the analysis of networks is now big business. However, in the development sector, analysis of networks remains weak.

This paper presents four cases where social network analysis (SNA) was used in a development programme. It focuses not so much on the organisational qualities of networks nor on the virtual networks facilitated by software, but on the analysis of connectivity in real world networks. Most of the cases are unintentional networks. What literature there is on network analysis within the development sector tends to focus on intentional networks and their quality. Our experience suggests there is considerable benefit to examining and understanding the linkages in unintentional networks, and this is a key part of this Practice Paper.

The four cases illustrate how social network analysis can

- Identify investments in training, and enable effective targeting of capacity building.
- Analyse a policy environment for linkages between people, and enable targeted interventions.
- Analyse an emerging policy environment, and stimulate linkages between different converging sectors.
- Look back on and understand the flow of ideas, thereby learning about enabling an environment for innovation.

These cases, while not directly from the intermediary sector, potentially inform our work with the intermediary sector.

In each Practice Paper published by the **Impact and Learning Team**, we share our experience and learning. We are presenting ideas that we are exploring and that others in the intermediary sector might like to explore.

Our experiences contribute to the body of knowledge, but rarely if ever contain incontestable insights. This paper should not be read in isolation, however, and should be seen as complementary to other work conducted on related issues of capacity development, knowledge management, and policy influence.

The knowledge and information intermediary sector comprises those who seek to improve flows of knowledge between actors in decision making and change processes in order to generate better development outcomes. Intermediaries act in a range of ways: enabling access to information; helping people to make sense of it; facilitating connections that enable knowledge to be shared between stakeholders. It is a practice sector which cuts across other sectors.

Networking among researchers, intermediaries and policy makers is increasing. Intermediaries need to determine where to concentrate their capacity building activities, how to target their interventions, how to create new spaces for debates, and how to analyse the flow of ideas through networks that they are a part of. The cases do not delve into the details of the power relationships between actors, nor into the quality of each linkage – the analysis has limitations. As a starting point, we need to recognise that in activities that are orientated towards poverty alleviation, development and human rights, there are two clusters of networks.

Intentional networks

Intentional networks, have some form and purpose. They often have a coordinating body, and they actually require investment in time, effort and money to initiate and maintain. At the DDRN 2010 workshop, Enrique Mendizabal and Simon Hearn from the Overseas Development Institute presented some ideas about intentional networks. They noted that ‘At RAPID we have studied networks from a functional approach (following the basic rule that form should follow function)’. Learning from that, they presented some guiding principles relating to network purpose, ensuring people understood their role, clarifying the functions of the intentional network, and the form of the network. These lessons learned echo some of the key work of others.

In *Next Generation Network Evaluation* (Scaling Impact 2010) although the authors point to the fact that the World Bank has been funding networks since the 1990s, ‘and is now currently supporting approximately 175 partnership programs, having spent \$3.5 billion in 2006 alone’, they state clearly in their paper that ‘The field of network evaluation is still young both in theory and practice’. They go on to say ‘Most studies using network methodologies to date have been small in both the size of the networks and the number of participants with the majority of these projects focusing more on network diagnosis than assessment’.

Building on a body of work (e.g. Horelli, Lisa, 2009; Creech, Heather; Ramji, Aly, 2004; Bender-demoll, Skye, 2008, Ramalingam, Ben and Mendizabal, Enrique. and Schenkenberg Van Mierop, eds., 2008), they suggest that analysis of intentional networks should include all three overlapping areas of quality:- Network Vibrancy, Network Connectivity and Network Effects, resulting in a long list of network components and measures. The paper echoes the statements of Mendizabal and Hearn – that networks have form and function, and offer tools and measures for considering the quality and effectiveness of the intentional network.

Unintentional networks

However there are also unintentional networks. Networks of friendship or common interest where people touch each other’s lives and where synergies of purpose can come about without intentional investment. On the one hand social capital is enshrined in the Sustainable Livelihoods Framework and the development community readily acknowledges the role of social capital (networks) in sustainable livelihoods. For many years participatory processes have incorporated Venn diagrams and stakeholder mapping to ensure that even at the household level social capital is taken into account. However, on the other hand, there is very little in more recent literature about unintentional networks and their influence on the development sector.

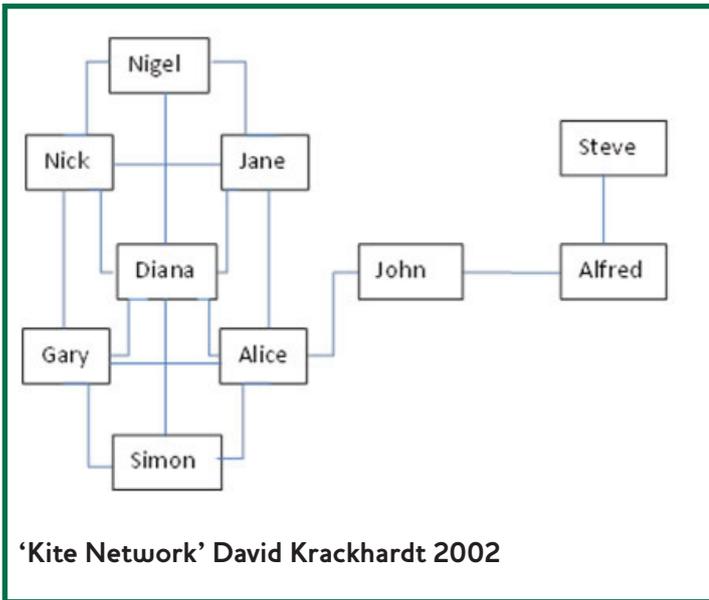
This paper asks whether intentional and unintentional networks can be analysed, and if they can, whether that analysis can be used to enhance their purpose (whether the purpose be intentional or unintentional).

Basic understanding of network analysis

A social network is said to be a social structure made up of individuals (or organisations) called nodes, which are tied (connected) by one or more specific type of interdependency, such as friendship, kinship, common interest, financial exchange, dislike, sexual relationship, or relationships of beliefs, knowledge or prestige.

Social network analysis views social relationships in terms of network theory consisting of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors.

The nodes described above can be individual actors or organisations, while the ties are open to considerable debate. Ties have to include some form of dependency or linkage, and it is the strength of those ties, and our expectation or assumptions about that strength, that is important to our subsequent analysis. In an intentional network, actors may ‘sign up’ to the network and establish a formal link within the network. However the modes and methods of analysis remain relevant in defining the strength of that linkage, and thus providing analysis and commentary on the effectiveness of the network.



Before grounding this discussion in case examples of how social network analysis has monitored and improved the effectiveness of networks in poverty alleviation, let us discuss some basic terminology of networks.

Centrality, The degree of centrality that a person, actor or node has is a simple count of the number of ties the person has. A person with high degree of centrality has many direct connections. In the diagram above, Diana has the highest degree of centrality.

Betweenness, is a measure of how much a node sits between one or more network groupings. For example in the diagram above Steve has high betweenness as he sits between the network that focuses on Diana, and that which focuses on Beth.

Closeness, is a measure of how 'near' an actor or node is to all other actors or nodes in the network, i.e. they have the shortest route to reaching everyone. For example,

Geoff has a higher closeness than Diana, because he has a shorter distance to everyone. Closeness is thought to be good for 'hearing what's on the grapevine', i.e. having the potential to have a good view on what people feel and think.

The nuances of the basic analysis of centrality, betweenness and closeness are much discussed in the literature. A bridge is a node with a unique betweenness, where removing that node separates two networks. Structural cohesion asks the question 'what is the minimum number of nodes to be removed in order for the network to 'disconnect?'' These nuances are best discussed by example, and this is done below.

So is this analysis being undertaken?

One of the champions for measuring networks in the development sector is Rick Davies. In his paper *The Use of Social Network Analysis Tools in the Evaluation of Social Change Communications* he outlines various uses of SNA.

'SNA is not tied to a specific theory of how society or individuals function. This is an important point to note when considering its use for evaluation purposes, since each program or project will normally have its own (implicit or explicit) 'theory-of-change'. SNA might be best described as a 'representational technology'. There are three aspects to this technology: network diagrams, network matrices, and mathematical measures describing the structure of networks, and the place of actors (individuals, groups, etc) within them.'

His definition of a network is very simple and includes unintentional networks. 'A social network is a number of actors connected by some kind of relationship.

In his overview of how SNA might be used for evaluation, Davies starts with describing three types of use found in development work. He notes that there has been significant use for epidemiological purposes e.g. understanding how HIV spreads. Secondly, for diffusion purposes, e.g. understanding how information and ideas about disease and health promotion spread within communities. His third type is for program planning, where networks are intentionally used for interventions. He quotes Heckathorn (1999) who reported 'the results of a field experiment that compares a network-based HIV prevention intervention, termed a Peer-Driven Intervention (PDI), with the standard form of street-based outreach intervention. The results suggest that the network intervention outperforms the standard approach with respect to number of people accessed, reductions in self-reported levels of HIV risk behavior and cost'

Davies then goes on to outline the possible use of SNA in evaluation. After introducing the principles of SNA, and using an example to describe stakeholder relationships between organisations, Davies introduces new approaches to the use of SNA. Linking SNA to the logical framework he suggests it has a place for describing the context of organisations. He then suggests there is a role for describing organisations where the expected developments are not as clearly articulated as on a logical framework. In a final section he proposes its use in more complex settings involving multiple organisations, each of which may have a plan of some kind, but where there is no central plan, or planner. It is this last use that we reflect on, in which SNA is used to describe unintentional networks. For each of the analyses described below, we will describe why the analysis was useful and improved the effectiveness of the development programme.

Defining the linkages

When we were describing how SNA is developed, the analysis assumes that the links between people are some form of social link. But what are these linkages? This is the key question when designing an analysis of a network.

In some analyses of networks, as described in their use for diffusion of ideas, researchers will be looking for pathways. These pathways may be for flow of information or knowledge, or for collaboration and cooperation or even, as in epidemiology studies, for infections; network analysis has been used to find how patterns of human contact aid or inhibit the spread of diseases such as HIV.

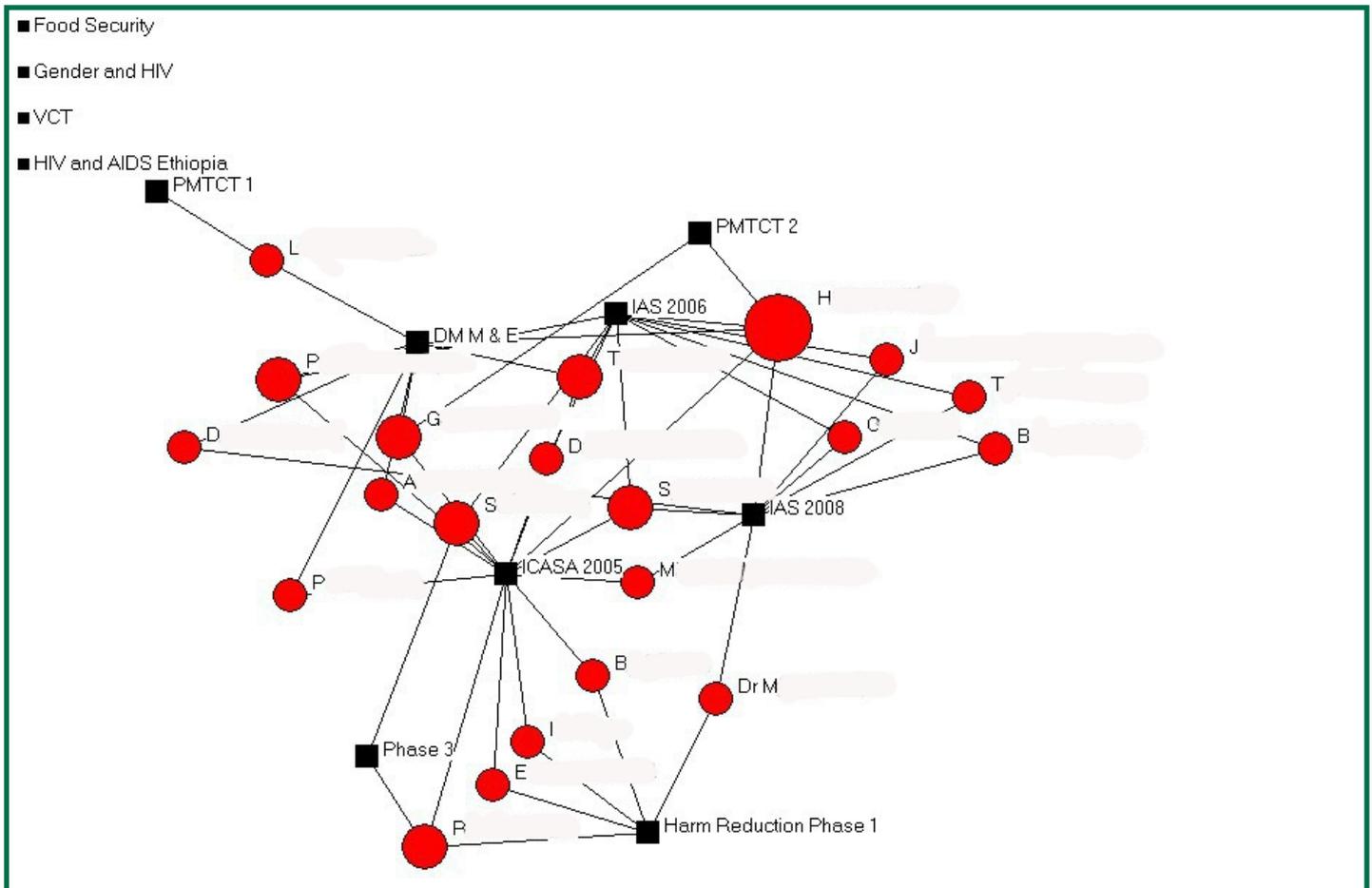
However while human contact is the core pathway of an infection, pathways for information flow are a little more nebulous.

In an intentional knowledge network we could define a link (i.e. a potential pathway for information to flow) as membership to that network. This is a common representation of a linkage – membership. But ‘membership’ manifests itself in a number of ways – it may mean observation of a website; it could mean regular attendance at events, face to face meetings; it might be an email discussion group. Email discussion groups are notoriously filed into separate folders on email systems so that receipt of the email does not mean the information is transferred – only that it has greater potential to be transferred than to, say, someone who is not even on the email list. Likewise, attendance at an event does not mean the person listened to the main talks, or that they met other people at the event. We can only say the possibility of them meeting someone at the same event is higher than someone not at that event.

However, for all the intentional networking above, there are other informal networks. Some people may attend an event that is not associated directly with the intentional network, and yet be meeting, interacting with, and sharing information and knowledge with people in their network.

We must decide what our linkage is. In the coming section we describe various uses of SNA and our own practical interpretation of what makes a linkage.

Mini case study: Training Events



All training events tend to make a participants list. These lists tend to be an annex to the training report, or end of year report, and are rarely referred to. Yet in a typical Non-Governmental Organisation working in a country, there is considerable investment in training event. Our experience is of a North-based NGO that regularly funds training in HIV for faith-based organisations in the South (Scott and Batchelor 2009).

Making the links

Using the participants list as a starting point, we defined the linkages in two ways.

- Attendance at a training event together with colleagues from other organisations means that ideas and information potentially spread across organisations.

Each participant is linked to their own organisation, and taking a view of who they interact with within their organisation could show the potential for the training to be passed back into the organisation.

Implications of the analysis

This relatively simple exercise provided the NGO with a view on its training investments. It was able to answer at a glance some key questions:

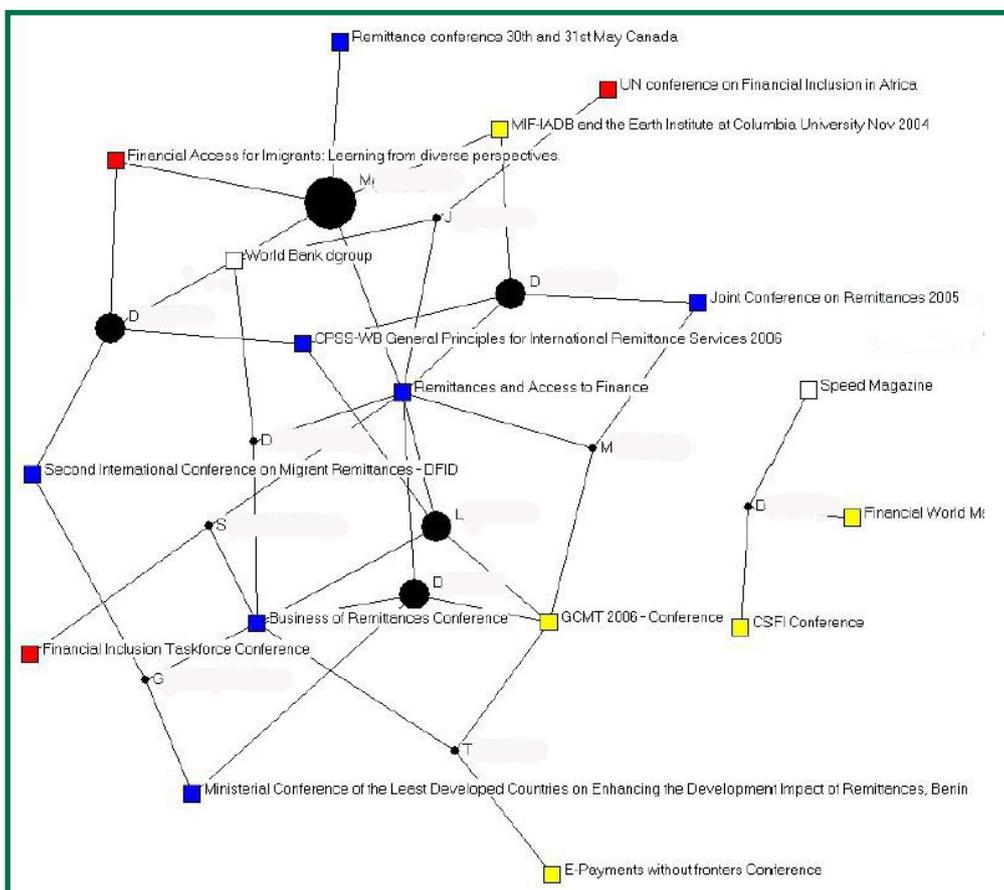
- Who, as an individual, had received the most training? As it turned out, there was a person who had attended almost all trainings. The head of an organisation that was known to be underperforming, this person subsequently (and nothing to do with the analysis) walked away from their job taking with them some of the organisation's resources. An earlier analysis might have flagged that for that organisation all the training and capacity eggs were in the same basket.
- Are several people from the same organisation being trained? Where an organisation tends to send different people to each training, the increase in capacity can be widespread but shallow. Each training was specialised and assumed delegates had a broad knowledge – in some cases this assumption was not accurate and the specialisation was not internalised because some of the basic understanding was not in place. By seeing which organisations were sending different people to different trainings, the NGO was able to arrange study sessions within their Southern partners to ensure sharing across trainings.
- Are people passing on their skills? Particularly where someone has attended several trainings, having made a substantial investment in that person, the NGO was able to ask how they were passing on their training. They were also able to interview some of the people who were 'next in the chain' to see how much they had understood.

Mini Case Study - Policy influence

There is increasing demand within the development sector, but particularly in the intermediary sector, for evidence that intermediary work is influencing policy formation. In this case a programme of work across the continent of Africa funded by DFID UK intended to strengthen ICT policy-making processes. This large programme of work had multiple actors, and worked in multiple countries. How could SNA assist in finding the contribution of this programme to policy development? While it cannot and did not intend to track specific moments of policy change and the pathways of influence, SNA was used to determine who the key people influencing policy developments were, and what connections they had to the Catia implementing organisations and staff.

programme stakeholder interviews, such that these people were interviewed whether they were directly engaged with the Catia programme of work or not.

- The analysis was able to show how many of the people and organisations in the database Catia implementers had potentially engaged with (by attending the same events). Of the full 8,000 on the database, Catia had engaged with only 4 percent. However of the top 200 with the highest centrality, Catia had engaged with 40 per cent. This was taken as an indicator that Catia had been reaching the right people.
- The betweenness factor quantifies a person's ability to bridge between groups. As will be seen in the next example one of the distinctives of the ICT sector is that digital convergence is creating new intersects between sectors – the Ministry of Health needs an understanding of the ICT sector. The analysis showed that one member of the Catia team had a very high betweenness and follow-up in interviews showed them to be very influential in getting groups to talk to each other.
- The analysis was not comprehensive, and we learnt that we must watch for outliers. In the stakeholder interviews it became evident that one actor in the President's office of a country, a young man with 'assistant' in his title, was the key influence for getting things done in that country. While he was mentioned regularly in interviews, he almost never attended events, and therefore he ranked relatively low in his centrality scores. The lesson learned is that the analysis can assist in guiding stakeholder interviews but it is not a substitute for that type of qualitative data.



Mini Case Study - New digital convergence spaces - MBanking

In this example, the idea that digital convergence is creating new policy spaces was analysed (Batchelor and Scott 2004). Early in 2003, research on how African households were using mobile phones, showed that people were attempting to transfer airtime to relatives and merchants as a 'virtual currency'. This prompted researchers to champion the emergence of mobile phone-enabled money transfer, and resulted in a new product worldwide. This championing process was the prompt for the now famous MPesa system in Kenya. Having decided that there was a need for championing Mobile Money Transfer, there was a need to convince

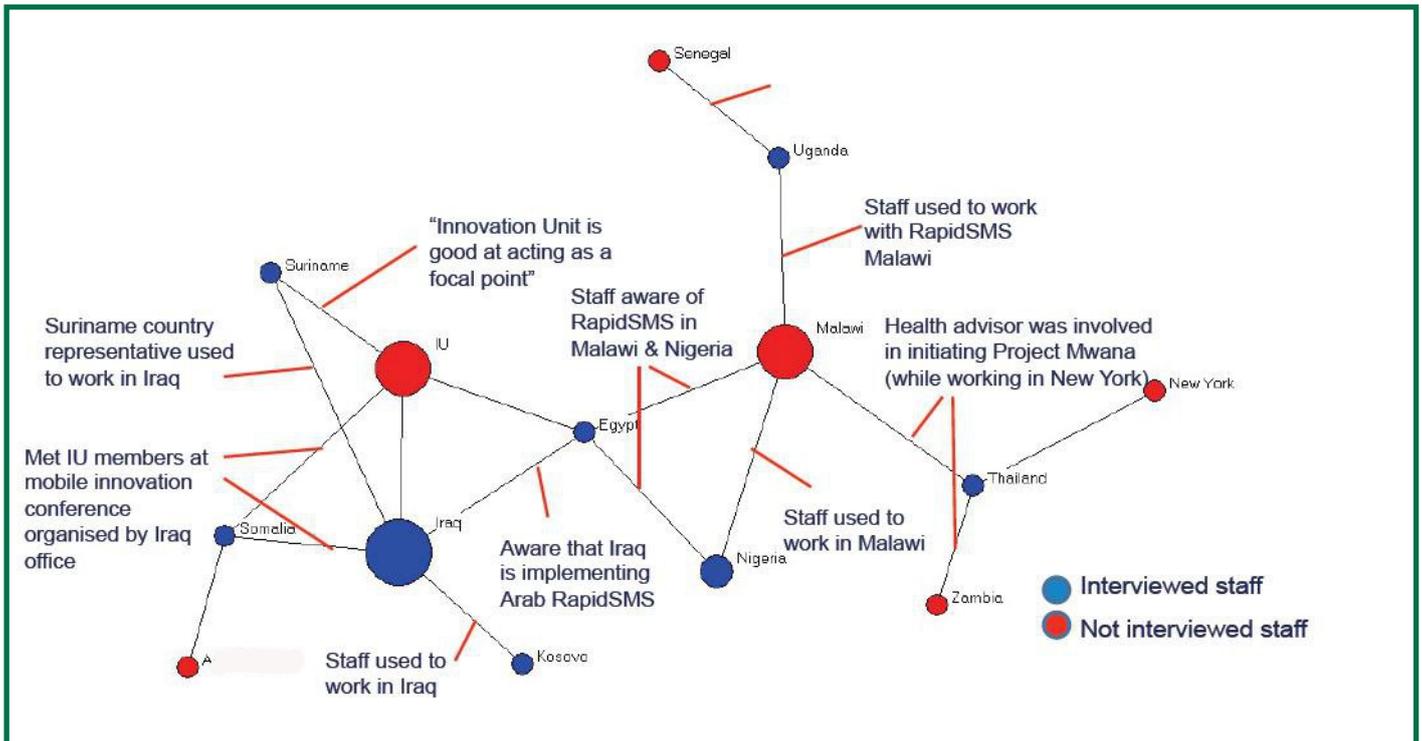
policy-makers to support these new initiatives. However the new initiatives sat in converged space between the Banking Sector and the ICT sector. Who should take responsibility, how could the converged sector emerge and who needed to be involved in the development of a whole new set of products and services?

A significant contribution to creating the emerging space was made through social network analysis.

Making the links

A similar process to the case studies above was undertaken regarding conferences, workshops and events. The three 'sectors' converging were banking, telecommunications, and microfinance (which included civil societies' responses to financial literacy etc.)

- (Publicly available) Participants lists of events that dealt with banking internationally.
- (Publicly available) Participants lists of events that dealt with telecommunications.
- (Publicly available) Participants lists of events that dealt with microfinance.
- (Publicly available) Participants lists of events possibly attended by either regulators in the financial sector or regulators in the telecommunications sector.



Implications of the analysis

The above sources were used to create a database, and UCINET was used to analyse centrality and more importantly, betweenness.

- It was the near complete lack of betweenness that was the convincing element. At the time of the analysis, those in the banking sector almost never went to telecommunications conferences, and vice versa. While some in civil society attended a few of the more private sector banking conferences, few if any attended regularly.
- Given this lack of betweenness, how could the new digitally converged sector arise? How could bankers have conversations with telecommunications experts and become aware of the rapid advancement of mobile phones in Africa, and dream about the new products and services that might emerge?
- When these visualisations were put in front of a donor (DFID), they were convinced of the value of a strategic initiative to create a conference specifically to facilitate a converged space for discussion. They approached the GSMA, and the first conference in Egypt was arranged specifically to have a target participants list of one third bankers (or those in the financial sector), one third telecommunications, and one third 'others' (civil society and government regulators).
- They achieved that mix, and since the first conference the Mobile Money Transfer Summit has become an annual conference and the place to make connections in the converged space.

Innovation and transfer of ideas

In this example, an international agency commissioned work to consider how their technology unit was communicating ideas throughout the organisation (Gamos 2011).

Making the links

- Organogram for the organisation.
- Tracking the history of movement of staff within the organisation.
- Programme plans which included specific elements of innovation.
- Interviewing staff

Implications of the analysis

A simple relational network pattern, linked to programme plans that incorporated the innovations clearly showed how it was not just the unit that was provoking innovation but that internal staff transfers were moving ideas from one office to the next.

Key lessons

What then do these mini case studies and our experience suggest as lessons for those wanting to go deeper into Social Network Analysis?

The cases suggest that relatively simple SNA can be useful for:

- Identifying key people – particularly useful when coupled with stakeholder interviews – it can guide who should be interviewed.
- Investing in a balanced way across networks – identifying when too much investment is being put into single people who become focal points and make the whole network vulnerable. What happens if that person falls ill or leaves the programme?
- Identifying individuals and organisations that have a betweenness or bridging role – this can be very important to the intermediary sector to ensure messaging and networking is wide reaching and not confined to a narrow set of actors.
- Investigating new convergence spaces – whether the broad set of stakeholders that are needed for new convergence spaces have an opportunity to meet.

From the literature in general there are some other lessons we would draw attention to:-

- Studies of unintentional networks suggest that whenever staff are hired or organisations engaged, they bring their own networks – reach into these networks is an asset associated with that person or organisation.
- The literature suggests that networks can create divided loyalties – should someone be sharing information across a network or is that information valuable to their own organisation? This needs to be taken into account when encouraging networking.
- It is difficult to control intentional networks, let alone unintentional networks. Unlike within an organisation, it is difficult to plan and implement a defined set of activities with confirmed outputs.
- There is however considerable value in networks, and organisations would benefit from giving staff time to engage in networks on a more planned basis.
- Electronic media will increasingly make connections in cyberspace – while current studies show that a face to face connection is still the key to unlock cooperation, virtual relationships in the next generation are likely to become stronger.
- SNA tools will increasingly unpack and analyse these virtual connections, and the development sector needs to be aware of these tools.

Conclusions

This paper has presented four cases where social network analysis was used in development programmes. We have noted that the literature tends to focus on intentional networks and their quality, and the cases draw out how unintentional networks can affect development programmes.

The four cases illustrate how social network analysis can:-

Type of case study	Purpose of analysis	Application to intermediary sector
Analyse investments in training	Enable effective targeting of capacity building	Determine where to concentrate capacity building activities
Analyse a policy environment for linkages	Enable targeted interventions	How, and on whom, to target interventions
Analyse an emerging policy environment	Stimulate linkages between different converging sectors	How, and with whom, to create new spaces for debates
Understand the flow of ideas	Enabling an environment for innovation	Analyse the flow of ideas through networks

These cases, while not directly from the intermediary sector, potentially inform our work with the intermediary sector. What we have seen is that there are ways to unpack unintentional networks, understanding the key linkages and finding out who has high degrees of centrality. We believe these experiences could be used to inform the intermediary sector and to enable intermediaries to position themselves within networks for maximum flow of information.

References and Further Reading

References for IDS Practice Paper In-Briefs are available via this link:

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We will update the page as we become aware of new relevant publications.

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The Impact and Learning Team at IDS are interested in how communication of research brings about change - in particular, what happens when people and technology mediate between researchers and decision makers. We use the term 'intermediary' to describe people and technology acting in this way. We think they play a critical role in making knowledge accessible, relevant and responsive to demand.

The work we are doing in the Impact and Learning Team (ILT) is exploring and testing this assumption using action research. We support people to think about the difference they want to make as well as how they are going to go about it. We draw insights and approaches from IDS's history of research, and the fields of marketing, strategic planning and evaluation, and capacity development.

This Practice Paper is an output from our work.

Full list of papers in this set

Batchelor, S. (2011) 'Learning about analysing Networks to Support Development Work?', *IDS Practice Paper In Brief 1*, Brighton: IDS

Batchelor, S. Gregson, J and Crooks. (2011) 'Learning about an Alternative Approach to Strategic Discussions,' *IDS Practice Paper In Brief 2*, Brighton: IDS

Ishmael Perkins, N. and Okail, N. (2011) 'The Large Conference Re-Imagined and Re-visited,' *IDS Practice Paper In Brief 3*, Brighton: IDS

Evangelia, B. (2011) 'Learning About New Technologies and the Changing Evidence Base for Social Science Research and Decision Making in International Development,' *IDS Practice Paper In Brief 4*, Brighton: IDS

Hogan, C. (2011) 'Learning about the Role of Culture in Research Policy Intermediary Work,' *IDS Practice Paper In Brief 5*, Brighton: IDS

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