

# SOCIAL NETWORK ANALYSIS

© Jonathan Priest 2005

**There's more truth to the statement "*It's not what you know but who you know,*" than we may realise. The study of social networks had largely been the province of social scientists but the internet has changed all that. There is now a widespread appreciation that social networks are about far more than socialising, they are good for our careers and good for business too. Research has shown that as much as 79% of the work in organisations is conducted via informal channels so perhaps companies should be looking at ways to oil the wheels of social discourse.**

Students of SNA distinguish between three types of social network;

- a) social networks seen from the individual's point of view.
- b) social networks in organisations as seen from the organisation's or the manager's point of view.
- c) networks comprising "agents" or "actors", not all of which are human, sometimes referred to as "actor network theory".

In this article I will focus on the first two, though the real power of social networks is probably only revealed when you examine the totality of the elements (or agents) they comprise. When studying the origins of a scientific discovery or a new business idea, the reality behind the manufactured history will undoubtedly involve a wide variety of agents, all of which made essential contributions. For example, H.M.S. Beagle and the finches of the Galapagos Islands could be included alongside Lamark and Wallace as agents in the actor network that enabled Darwin to develop his theory of natural selection.

## **in ur drms bddy**

A young man I recently interviewed for a video on innovation thought that speed dating and texting were the greatest innovations of our age. Not only was he able to meet more girls; rather than face the agony of rejection with a follow up phone call, he could use texting to receive a more gentle rebuff. Whatever the motives, technology has made networks and their study a lot easier. However, there's a lot of confusion about how social networks operate and why they are important. Being well connected, knowing whom to call, having friends in high places is the more egocentric vision of a social network. But the wider social networks of which we form just one element are more organic in nature and, like corals, the whole is far greater than the sum of the individual parts. Social networks operate in unexpected ways; for example your direct contacts may be less valuable to you than more distant ones. It's not just whom you know, but the people whom the people you know, know!

## **The strength of weak ties**

The value of friends of friends was established as long ago as 1974 when sociology student, Mark Granovetter published the findings of a study he conducted as part of his PhD at Harvard University. He surveyed how a group of young men found their current jobs and revealed that contacts are indeed key to getting a job but, ironically, not strong contacts such as family and close friends but far looser associations, the friends of friends.

In his book, *"How to get a job"* Granovetter, (who coined the phrase 'the strength of weak ties'), revealed that people who found their job via informal methods generally received higher salaries and had greater job satisfaction than those who went through official channels.

The reasons he suggests are that:

- a) an individual's network usually has many more weak ties than strong ties and therefore receives information about more jobs from weak ties.
- b) weak ties are more likely to give an individual information he or she does not already have - including information about job opportunities.

It also occurs to me that perhaps we are more competitive with our closer associates and have less to lose (and can expect less comeback) when we recommend those we know less well.

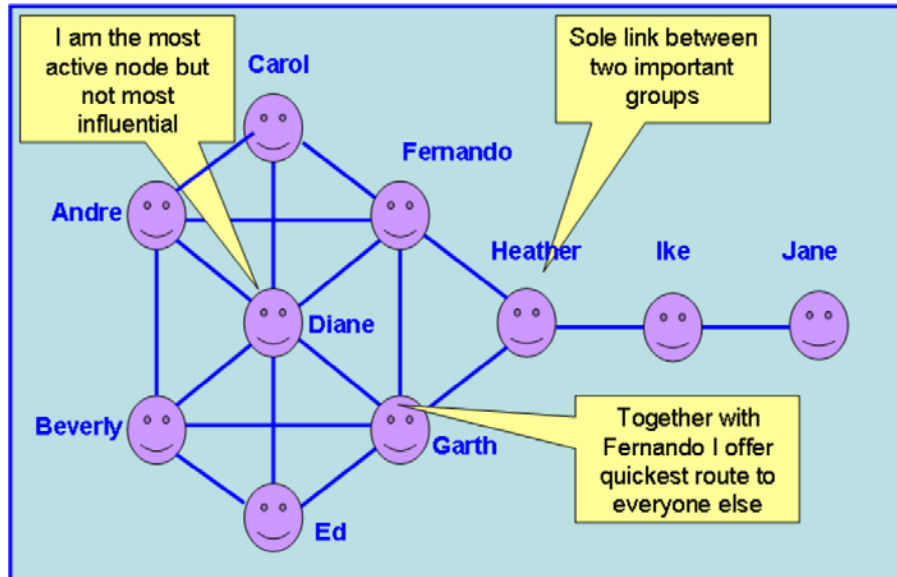
## **Networks go to work**

Professor Patrick Laughlin of the University of Illinois has demonstrated that groups outperform even the best individuals in decision making so the emphasis that companies place on teamwork has a solid foundation. But it's not just the formal structures that are important. Research shows that 79% of all work in some organisations is conducted via informal channels. While traditional management thinking would perceive an efficient workforce as one that has its noses constantly to the grindstone, in a knowledge economy companies that actively encourage social discourse are more likely to succeed. The social networks play an essential role in the long term performance of organisations where they help to promote knowledge sharing, cooperation and a sense of shared mission and values. The good news is that it is now possible to analyse and optimise social networks using a variety of software tools and organisational processes (also see Knowledge Management).

Some of the reasons why organisations with large and effective social networks perform so well include better access to information and knowledge, better knowledge sharing due to established trust relationships as well as better team work. Strong groups also suffer lower rates of staff turnover, thus reducing waste. So anything we can do to better understand how groups function and how malfunctioning groups can be fixed is likely to deliver competitive advantage. Outings, sports and social events should be seen not as a cost but an investment because they help to revitalise social networks.

## Kite network

So what does a group look like once it has been subject to Social Network Analysis? The diagram below is a Kite Network that was developed by David Krackhardt, a leading researcher in social networks.



The lines connecting any two nodes imply that they talk to each other on a regular basis. The role of the social network analysis is to establish the 'centrality' of each node; how they relate to each other and to the group as a whole. Centrality measures an individual's reachability. Centrality is related to opportunity and to "social capital." This network shows the distinction between the three most important types of centrality:

- ◆ Degree Centrality
- ◆ Betweenness Centrality
- ◆ Closeness Centrality

### Degree Centrality

Degree centrality refers to the number of individuals with which an individual connects. However, it would be wrong to assume that the people with the largest number of connections are the most valuable to the group. If this were so, Diane would win hands down as she is clearly the most active node in the network, a 'connector' or 'hub'. However, closer inspection shows that Diane is only connected to the people in her immediate cluster and that she only connects with those who are connected to each other.

### Betweenness Centrality

Betweenness Centrality measures how often a node is 'between' others. An individual who is between many is assumed to have a higher likelihood of being able to control information flow in the network. Heather has fewer direct connections compared to Diane however she is the sole link between two important groups and is likely to play a 'broker' role in the network.

Without Heather, Ike and Jane would be cut off from all that's going on in Diane's cluster. The bad news is that she is also a single point of failure.

### Closeness Centrality

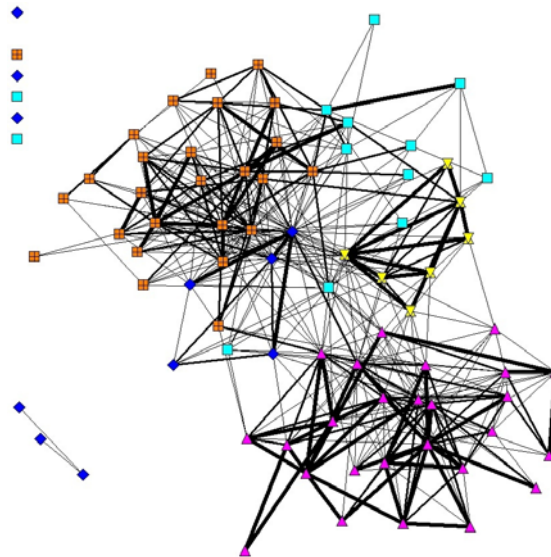
Closeness Centrality measures how many steps you are from others in the network. Fernando and Garth have fewer connections than Diane, yet the pattern of their direct and indirect ties allow them to access all the nodes in the network more quickly than anyone else. They have the shortest paths to all others and they are close to everyone else. They are in an excellent position to monitor the information flow in the network and have the best visibility into what is happening in the network.

### Tipping Point

Malcolm Gladwell of 'Tipping Point' fame refers to 'mavens', people who are well connected because they have a specific expertise that everyone draws from, and the highly connected nodes in social groups he calls 'connectors'. Between them, connectors and mavens get things moving and then help spread the word.

### SNA Tools

SNA tools have been around for decades but in the internet era it now so much easier to monitor communication among group members. One of the most highly regarded is called InFlow and was developed by Valdis Krebs.



*This chart produced by Analytica reveals that knowledge sharing and communication between departments in an investment bank are minimal and that the managers (in blue) are out on a limb. The thickness of the lines indicates the level of activity.*

Analysing an organisation's social network is clearly only the first step in refining and its knowledge sharing capabilities. UK-based Analytica provides a more integrated approach, also helping companies fix dysfunctional social networks. An investment bank asked them to reveal the extent of knowledge sharing between key departments. The diagram above shows a month view of email and telephone activity. The squares are people colour coded by department. All the managers are marked in blue. The analysis revealed that not only do the various departments not share knowledge but also that the managers are largely divorced both from their departments and the knowledge sharing process.

## **Applications for SNA**

### Invisible barriers

SNA can be used to identify the invisible barriers to cooperation, advice and knowledge sharing which can severely hamper an organisation's performance. Invisible barriers go beyond mere personality differences or bad will; they might include factors such as age, gender, seniority, educational background and physical distance (beyond around 30 meters) and it could include a combination of two or more of such properties. Social network analysis can easily identify the invisible barriers, quantify their impact and help prescribe simple, targeted treatments.

### Encourage Communities of Practice

SNA can reveal emergent Communities of Practice, informal groups that have been created in order to tackle issues of shared concern.

### Identify bottlenecks

SNA can identify people or resources that create bottlenecks and suggest ways of circumventing them.

### Promote innovation

By identifying the people in an organisation who are innovators, it may be possible to deploy their talents to greater effect by involving them in projects requiring innovation.

### Promote knowledge sharing

Social network analysis can document how knowledge is currently shared within the organisation and suggest simple initiatives to promote knowledge sharing. It can also help managers understand how knowledge enters and flows within the organisation.

### Calculate the effects of planned organisational change

Whether the proposed changes are large-scale redundancies or the expansion into a changed physical environment, social network analysis can provide managers with important insights into the real consequences of organisational change.

## **Are you reading what I'm reading?**

SNA tools are also helping to reveal and compare people's buying behaviour. For example, InFlow is used to analyse the book-buying patterns on

Amazon.com, producing the feature *"people who bought this book bought these other books"*. Analytica has taken this a stage further with the launch of ConnectViaBooks.com which enables subscribers to connect with people who have read the same books so that they can exchange ideas and no doubt, phone numbers – a bookish approach to finding kindred spirits.

### **Criminal networks**

InFlow has been used to analyse criminal and terrorist networks. Using information in the public domain, Krebs analysed the relationships between the 19 hijackers involved in the 9/11 attacks and demonstrated that while Mohammed Atta was centrally involved in coordinating the attacks, Mohamed Abdi took responsibility for their long term planning. You can be sure that the search of Osama bin Laden and the London bombers is involving all the might of SNA as indeed did the hunt for Saddam Hussein. These days, you would have to be a hermit or live in the rain forest to avoid becoming a node someone's social network.

### **In conclusion**

Human beings are social animals. Much of their brain power is dedicated to establishing a place within the social order. While we may be required to look and behave like automatons at work, in reality we are operating at a much more instinctual and social level. While socialising at work was generally regarded as peripheral and a distraction, we now realise that social networks provide a strong cohesive matrix and are far more relevant to performance than lines of reporting and formal channels of communication.

### References

Analytica	<a href="http://www.analytica.com">www.analytica.com</a>
ConnectViaBooks	<a href="http://www.connectviabooks.com">www.connectviabooks.com</a>
InFlow	<a href="http://www.orgnet.com/">http://www.orgnet.com/</a>
Semantic Studios	<a href="http://semanticstudios.com/">http://semanticstudios.com/</a>

#### **Jonathan Priest**

Creative Communication  
[www.creative-writer.com](http://www.creative-writer.com)  
[solutions@creative-writer.com](mailto:solutions@creative-writer.com)  
+44 (0)20 8767 0811  
+44 (0)7973 406417

Do you have a message to articulate, a business to develop, people to train? Do your marketing communications reflect your true value? If not, it may be time to get creative with your communication.

**This article is published with the kind permission of [Simply-Communicate.com](http://Simply-Communicate.com)**