# Seeing Relationships at 36,000 Feet – Social Network Analysis

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"*This 'telephone' has too many shortcomings to be seriously considered as a means of communication.*"

Western Union memo, 1876

Social network analysis (SNA) is not a synonym for online social networking (sorry, no acronym). For those who have spent time reviewing the innumerable online networking sites that have popped up on industry like legwarmers on an 80's band, this might feel familiar. However, SNA is a very different matter and it should be on all CI professionals' radar.

To understand the primary difference between online social networking and SNA, consider this analogy. You board an airplane, chat up a fellow passenger (while examining an hermetically sealed sandwich), discover interesting new and mutual contacts, and agree to connect later to make introductions. That's networking.

Add a web browser, a cumbersome sign-up process and a legal longueur, and you've got online social networking. Companies in this space include LinkedIn, Tribe, Ryze, Friendster and others with equally cute names. Major applications for online social networking revolve around personal and professional relationships (aka *sex and money*).

Now imagine that you're an air traffic controller – able to see not only those two passengers waiting desperately for soda refills, but all other passengers on every other plane grounded and in air en route to and from your hub. You are able to see possible relationships and connections between myriad passengers and dynamic patterns amongst flight routes, the entire topology.

Add a few advanced degrees, complicated software, puzzling jargon and unique methodologies for analysis

and you've got social network analysis (SNA). Major applications for SNA range from anti-terrorism and the study of infectious disease outbreaks to corporate relationship mining and anthropological research (aka *war, sex and money*).

## TECHNOLOGY ENABLES ANALYSIS

Interest in SNA has grown substantially in recent years because cheaper technology makes complicated network analysis easier. Not only has the funding within the private sector increased for new SNA-oriented software companies, but also SNA principles are finding their way into mainstream vehicles ranging from journalism and law enforcement to internet search and anti-spam technology.

If there is one strong contemporary evangelist for SNA, it is Dr. Stan Wasserman. Currently, Stan is Rudy Professor of Sociology, Psychology, and Statistics at Indiana University and also serves as chief scientist for Visible Path, an enterprise SNA vendor. He is the co-author of 'Social Network Analysis: Methods and Applications,' the definitive textbook on social networks. What follows are highlights from our conversation.

## Could you offer a basic introduction to SNA?

Well, everybody networks, whenever you meet somebody, you are networking. At Visible Path, we advocate developing relationship capital to make business better. The software allows people to connect to the people they're connected to, either directly or indirectly.

## Where did SNA come from?

Anthropology, sociology, a little bit of psychology. Jacob Moreno, who was one of the founders of the discipline, was a psychiatrist. He was interested in how people connect and specifically the people who were disconnected. Moreno was really the first person to look at networks as a whole; other people had talked about connections, but he did it scientifically.

## How did SNA evolve through technology?

As computers became more useful, they led to more sophisticated methods. In the seventies, when I started, people were working with various Fortran and APL programs. Graph theory was slowly implemented and becoming easier to use. The first big network analysis program, ESINet, began life around 1980.

SNA would still be interesting even if there weren't software applications. Graph theorists have been proving theories for over a hundred years. What was important was the beauty of the mathematics and there was so much more that one could do analytically.

## What are some of the most interesting current developments?

We can think about much larger networks because we have the tools to look at them – whether it's everybody in a community and how they communicate, spreads of epidemics, or aspects of the internet itself. The physicists who have recently moved into SNA began by really looking at the topology of the web. Because the internet is a graph, there are some interesting things that you can do to study it and model it.

I've done work in terrorism methodology with the Office of Naval

Research. There are about ten good network analysts in university settings who are funded by grants to look at SNA for anti-terrorism applications.

Google is also using SNA oriented principles within their page rank algorithms. The way they do a search and present results is a network process. The program is actually doing a net-work analysis and analyzing the data. Then it gets to doing a network search to figure out which page it should give you first.

There's also an SNA related approach to creating ad and spam blockers by looking at one's networks. People are trying to develop algorithms based on email identity. Instead of looking at just the senders, like most spam blockers, different algorithms look at both senders and receivers – like who are the typical senders who are also receivers, and that's more effective.

### Where does most of the data for SNA come from – and how do you know if it's any good?

The explosion of interest in SNA over the last decade has come in part from the fact that electronic communication is now the norm. The records of who's interacting with whom exist and the interactions of large groups of people can be studied and utilized.

Nobody has really good data, and some people have better data than others. Most social and behavioral scientists get the data from surveys. Some of the early studies involved groups interacting around tasks, as a function of group structure.

### What are the privacy concerns surrounding SNA?

There was a piece in the *New York Times* a year ago where the author described organizations watching who you talk to, so people got hung up on that '1984' thing. Several companies provide SNA as a service where privacy is handled properly.

We have people on our advisory board who are privacy experts, and we sell to enterprises and groups of people, not individuals. By limiting the scope

of networks by selling (and introducing it) to entire groups of people, you have much better control. If you work for one of these big places, it's hard to say no when they say "we're going to be looking at your business contacts. Here's software that helps you work better, but we have to look at the individuals you communicate with."

This is information that their superiors already have, and people already have access to the same Outlook address books and contacts. It's all part of what the company owns. We could complain about it, but it's a different issue from privacy.

### Are there infinite potential applications?

There are a small and finite number of applications. For example, savvy executives are going to look at how their 100 sales people interact with the rest of the world, and by looking over that data the VP of that sales organization will understand his business better.

It's also new technology. The telephone wasn't hard to use, but there were people who were likely confused for years; SNA is like 21st century telephones, a new way of communicating.

### Could Knowledge Networks be a foot in the door for SNA?

Yes, like that saying "it's not who you know, it's who you know who knows." I don't see a lot of software out there for knowledge network applications, but I'm sure more is coming. The primary need was for sales and direct contact. At Visible Path we originally had just that, but now we have two other applications to be released shortly, one for human resources and one for marketing.

We had this idea a year ago that SNA is not that different from Emotional Intelligence, just Relational Intelligence, so SNA offers your relational quotient, your 'RQ.' You're learning to use your relationship capital and understand why it's important. But it's also dependent on your relationship

capital, getting the work done, so it's no different than what successful people at a corporation are doing.

### What major company is most likely to enter into commercial and consumer SNA?

Google. They're new, innovative, and they're also one of our cousins through the Kleiner Perkins venture capital family. Those CEO's all get together, they have power breakfasts. Google also has hundreds of very good people working for them; Visible Path has just ten people like that.

### So what's next for you?

I just moved to Indiana to teach here. What I've been doing for 30 years is promoting SNA and doing methodological research. I'm a methodologist, I create the methods, help people analyze data, so I'm not really an applications person, and I don't really collect data. I do both research and teaching right now, including a fair amount outside of university settings, like workshops. All I really know is Academia, though this corporate stuff that I'm involved in right now is fun, and I've learned a lot.

If you'd like to speak with Stan about the academic side of SNA or explore the training which he does beyond the walls of Indiana, please send email to: *stanwass@indiana.edu*.

This column was based on an edited excerpt from an upcoming book about human capital research.

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